Wales & West Utilities Our business plan for 2021-26

A sustainable business in a changing and dynamic sector

December 2019

WALES&WEST UTILITIES

A guide to using this plan

This interactive PDF is designed to help you easily navigate our plan and find the information you are looking for. For the best experience, it is recommended that this document is viewed in Adobe Acrobat Reader.

Guide to the navigation buttons:

Use the tabs and buttons at the top of the page to navigate between sections and around the document.

	Return to contents page
	Page back
	Page forward
	Return to previous view
	Search

Guide to dynamic links:

Click on the dynamic links throughout the document to access further relevant content.

▶	Link to business plan data tables
3	Link within the plan
Appendix X	Link to document outside of the plan

Guide to the icons:

CVP CVP net zero	This logo denotes our Consumer Value Proposition (CVP)
	This logo denotes where our plan aligns to the SDGs
	This logo denotes innovation throughout the plan

Legal notice

This Document has been published to the Company's website for information purposes only, and use of or reliance on this Document by any person is at their sole risk. By opening this Document, such persons agree to be bound by the limitations as set out in the Legal Notice's located within the Document.

An actual or prospective investor in any securities issued by the Company or any parent undertaking of the Company should not rely on the information contained in this Document for the purposes of any investment decision or otherwise. This Document is not a prospectus nor is it a "financial promotion" within the meaning of section 21 of the Financial Services and Markets Act 2000, and it has not been published with the intention of inducing any person to make any investment decision in relation to securities issued by the Company or any such parent undertaking or of influencing any such decision.

Nothing in this Document should be construed as investment, legal or other advice, and no actual or prospective investor should act upon any information contained herein without first consulting a financial or other professional adviser.

Neither the publication or delivery of this Document nor any subsequent subscription or sale made in respect of any securities issued by the Company or any parent undertaking of the Company shall, under any circumstances, create any implication that the information contained in this Document is correct as of any time subsequent to the date of this Document.

To the maximum extent permitted by law, the Company excludes:

- all undertakings, representations, warranties or other assurances (express or implied, statutory or otherwise) in connection with this Document and the information and opinions contained herein; and
- any responsibility or liability (whether direct or indirect, in contract, tort or otherwise) as a result of the use of or reliance on (or inability to use or rely upon) this Document or the information and opinions contained herein.

Nothing in this notice shall be taken to limit or exclude any liability which may not otherwise by limited or excluded under applicable law.

This Document contains forward-looking statements. In some cases, forward-looking statements can be identified by their use of terms such as "believe", "could", "envisage", "estimate", "intend", "may", "plan", "will" or the negative of those, variations or comparable expressions, including references to assumptions or by discussions of the Company's future prospects, developments and business strategies. By their nature, forward-looking statements involve risk and uncertainty because they relate to future events and circumstances.

The forward-looking statements in this Document are based on prevailing financial, economic and market conditions and current expectations as at the date of this Document – actual outcomes and results may differ materially from any outcome or results expressed or implied by such forward-looking statements.

No statement in this Document is intended to be or may be construed as a profit forecast. Past performance is not indicative of future performance. Any forecasts, figures, opinions, statements of market trends or business strategies expressed are those of the Company, unless otherwise stated, as of the date of publication and may be subject to change.

Neither the Directors nor the Company undertake any obligation to update, or to correct any inaccuracies which become apparent in, this Document other than as required by any relevant regulatory authority, whether as a result of new information, future events or otherwise.

Except where stated to the contrary, all financial values within this paper are stated in 2018/19 prices, inclusive of 0.5% pa compounding efficiency and prior to real price effects. This is in order that they match the figures used within the detail of the Business Plan Data Template.

Business plan redaction statement

In the interests of transparency and to facilitate meaningful stakeholder engagement, no content from this business plan document has been redacted. There are a small number of appendices which have been redacted, in part or in whole, on the grounds of commercial confidentiality or market sensitivity.

Click for our **Redaction Explanatory Statement** published alongside our business plan.

Contents

A Summary of our plan

Foreword 3
1. Executive summary 4
2. Our consumer value proposition 14
3. Outputs and incentives 18
4. Track record 25

B Meeting the needs of consumers and network users

5. Giving customers and stakeholders a stronger voice 35
6. Customer service 52
7. Social obligations 62

C Delivering value for money

8. Customer bills 73
9. Cost efficiency 77
10. Using competition to deliver best value 87
11. Our innovation strategy 92
12. Dealing with uncertainty 104

D Delivering an environmentally sustainable network

13. Our net zero ready vision for 2035 110
14. Environmental Action Plan 126

E Maintaining a safe and resilient network

15. Asset resilience 138
16. The distribution network 148
17. Connecting homes and businesses 164
18. Transmission and pressure management 173
19. Workforce resilience 181
20. Cyber resilience 188
21. Business IT security plan 189

F Financeability

22. Financeability 195

Click our **Business Plan Data Tables (BPDT)** for detailed cost and workload information to support our submission.

Click here to see a full **Appendix** list with hyperlinks 198

A

Summary of our plan

This section of our business plan summarises our commitments to customers.

We also set out our proposed level of expenditure, as well as the outputs we will deliver as part of the RIIO framework. All of this is built on a strong track record of delivery, which is also summarised here.

In this section:

Foreword 3
Strategic overview of our plan from our Chairman and Chief Executive.

1. Executive summary 4
Overall summary setting out our vision for the future, the views of our customers and stakeholders, and our GD2 commitments.

2. Our consumer value proposition 14
How we are delivering for our customers above and beyond the minimum requirements measured by our Social Return on Investment Tool.

3. Outputs and incentives 18
The outputs and incentives contained in our business plan – including those that are common to all networks and those bespoke to us.

4. Track record 25
Our GD1 performance and the outcomes delivered for customers.

Foreword

We are pleased to present our business plan for 2021-26, which has been developed in partnership with our customers and stakeholders.

Graham Edwards
Chief Executive

Welcome to our business plan

Our plan puts customers at its core and has been developed in partnership with them, along with diverse stakeholders. We have had extensive conversations, combining far-reaching engagement with granular, in-depth research.

This is our most ambitious and stretching plan ever, but one we are confident about delivering based on our history as a leading performer. We are proud of our record to date, and we see the opportunity in the next five years to take our ambitions further.

Our aim is to deliver a net zero ready network by 2035 – using our position as a leading player in the future energy space to put forward a bold and credible plan that will support the decarbonisation of heat, power, and transport in our region. Based on a whole systems approach, our plan includes a clear, low-cost pathway to deliver our vision, informed by robust scientific evidence and changing customer needs. Our plan is a positive response to the clear steer from our customers and from the wider public, that society must act now to mitigate the threat of climate change.

As a responsible business, we take care to provide the same high quality of service for everybody – particularly those living in vulnerable situations. We were proud to become the first gas distribution network to meet the requirements for the British Standard for Inclusive Service Provision (BS 18477). Our customers have told us they want us to go even further, so in GD2 we are virtually doubling our support for those most in need. This includes working with partners to help maximise the income of those in fuel poverty, putting more people on the ground to offer face to face support, and collaborating with other utilities to create a single Priority Services Register (PSR).

In response to the increasing importance our customers and stakeholders place on the environment and wider sustainability issues, we are committed to becoming an even more sustainable business in GD2, aligning our commitments to the United Nations Sustainable Development Goals (SDGs).

This progressive global movement will support our efforts to bring a sharper focus on the broader societal goals that we can help to achieve. We are already putting this into action, and this plan includes stretching goals to reduce our own carbon footprint and to work towards becoming a zero-waste company. We are also giving stakeholders more of a say in the future of the business through our enhanced engagement plans for GD2.

This document sets out our aspirations to invest almost £1.2bn to support customers and society more broadly than ever before – which can only be delivered with proper funding, as laid out in this document. Despite being one of the most effective and efficient networks in GD1, shareholders have funded debt costs that should have been allowed for in the price control settlement. We are looking to Ofgem to ensure that the business is properly funded in GD2, so that we can successfully deliver for customers.

Finally, we thank our committed colleagues who have made Wales & West Utilities (WWU) the top performing business it is today – and thank our customers, stakeholders, and the independent Customer Engagement Group (CEG) for their engagement, challenge and support in developing this ambitious plan.

Graham Edwards
Chief Executive

Andrew Hunter
Chairman

Chapter 1. Executive summary

We are submitting this plan at a critical time for the UK's energy sector, with legally binding targets to deliver net zero by 2050.

At the same time, the energy system is fast becoming one of complex, dynamic interactions – driven by changes in both the supply and the use of energy. Our ambition to decarbonise heat, power and transport will deliver a net zero ready network by 2035 (ie a fully plastic distribution network ready to receive green gases). Based on a broadly defined whole systems approach, our plan will facilitate low-cost, reliable and sustainable energy for the generations of today and the future.

This is our most customer focused business plan to date, reflecting many conversations with stakeholders about what matters most to them. Our plan also reflects the robust challenge from the independent CEG and the RIIO-2 Challenge Group. In this summary, we outline what they have told us and how we are responding to this engagement with our commitments for GD2.

This plan builds on our GD1 track record as a top performing network that delivers and innovates. It serves to reassure customers that they will continue to receive excellent service long into the future. We also outline the significant added value services we are offering in GD2, which go above and beyond the minimum requirement. These services – our Consumer Value Proposition (CVP) – are valued at over £122m in GD2, with a further £20m in GD3 and beyond.

The following logo identifies our Consumer Value Proposition throughout the plan. CVP

1. Our performance in GD1

Delivering value for money

- We are one of a few networks to have delivered on all of our promises and are one of the most cost efficient, as reported by Ofgem[1].
- We are sharing the benefits of our efficiency with customers, returning £72m through lower charges in GD1 and a further £81m in future years. This has resulted in one of the lowest network charges of all of the GDNs[2].
- Our ambitious innovation programme has delivered more than £9.7m of value in GD1, bringing improvements in customer service, reliability and the safety of our services.

10,000

The number of families we have helped to lift out of fuel poverty by transferring them to a gas supply.

CVP **£122m**

Consumer Value Proposition in GD2.

CO_2 **18%**

Fewer carbon emissions since 2013.

1 Click for the **Ofgem RIIO GD1 Annual Report 2017/18 – Paragraph 4.9, Figure 4.1.**
2 All figures quoted throughout this plan are in 2018/19 prices.

Meeting the needs of consumers and network users

- We actively listen to our customers and stakeholders, who have significantly influenced the shape of our business in GD1.
- Customers have received excellent service from us. We recently achieved a customer satisfaction score of 93.6 out of 100 in an independent evaluation by the ICS (Institute of Customer Service). This is significantly higher than the utility sector benchmark of 74.7, and places us among the leading companies in the UK.
- We are working with partners to provide enhanced support for those living in vulnerable circumstances and have lifted almost 10,000 families out of fuel poverty by transferring them to a gas supply – saving customers £680 a year, on average.

Maintaining a safe and resilient network

- We have improved reliability such that consumers will, on average, only experience an unplanned interruption once in their lifetime – lasting around eight hours, compared with a 26-hour GDN average in GD1. Our average planned interruptions now last less than three and a half hours, compared with the industry average of over five hours in 2018/19.
- We are proud of our safety culture and have further reduced the risk of gas explosions by 50%. Our overall safety performance saw us winning the RoSPA Oil and Gas Sector Award in 2019 for industry leading performance, and achieving the RoSPA Gold Award in 2019 for the sixth year in a row. This success is unprecedented in our sector.

Delivering an environmentally sustainable network

- We have lowered carbon emissions by a further 18% since 2013; at the same time leading on innovation that helps decarbonise heat, while minimising the cost and impact on consumers. Our hybrid heating 'Project Freedom' is one of the most ambitious projects supporting the decarbonisation of heat in the UK, saving families up to £700 a year in energy bills.
- We have enabled significant amounts of green gas to enter our network, connecting our first biomethane site in 2014, and now delivering enough low carbon gas into the network to heat the equivalent of 130,000 homes. We are also providing the flexibility necessary for increasing renewable energy across our region.

£700 a year is the potential saving for customers using hybrid heating systems, as demonstrated by Project Freedom.

In the rest of this summary, we outline how we are building on our success in GD1 to deliver outstanding services in GD2.

Click **Appendix 1A** for an index showing where we have addressed the Ofgem minimum requirements in our plan.

Click **Appendix 1B** to navigate through our plan with reference to the Business Plan Data Tables (BPDTs).

Click **Appendix 1C** for our change logs for July-October and October-December business plans.

Chapter 1. Executive summary (continued)

2. Our vision for the future

In GD1, our ambition was to deliver outstanding levels of gas safety, reliability and customer service. We are proud to have achieved this, and will continue to stretch ourselves further during GD2. Strengthening our focus on the things that matter to our customers will be key; being a responsible and sustainable business, supporting customers in vulnerable circumstances, and enabling a low-cost, green future.

WWU is a key player in the energy sector, across our network and beyond, leading the debate and research into the future of energy. We are in a strong position to act on the clear steer from the wider public that society must act now to mitigate the threat of climate change.

Our innovative plan to support the UK's decarbonisation targets and become a net zero ready network by 2035 represents a pathway that is both credible and achievable. It encompasses the use of green gas and hydrogen, alongside renewable electricity, to decarbonise heat using hybrid heating technology in homes and businesses across our region. The use of renewable energy and green gas will also support the decarbonisation of all types of road transport, bringing improvements in air quality.

We will continue to collaborate with electricity networks including UKPN, WPD, SSEN and SPEN on whole systems development and to provide local, joined-up energy network advice. We propose a whole systems charter to further demonstrate our commitment to working with a wide range of stakeholders in order to create customer focused, least cost and joined up solutions to deliver decarbonisation.

Click **Appendix 1D** for a letter from WPD and SPEN about our successful collaboration.

As a responsible business, we understand that affordability is a serious issue for many. While we cannot end fuel poverty on our own, our vision includes the use of innovative partnerships to ensure that those who struggle to afford their energy bills are accessing grants or other relevant funding to maximise their household income. This is in addition to increasing our commitment to support those in vulnerable situations, tailoring our services to suit individual needs.

We are committed to delivering our services sustainably. We have published an ambitious Environmental Action Plan and will focus on the way we operate, tackling complex sustainability issues at a local and regional level.

To demonstrate how serious we are, our commitments will be underpinned by the UN Sustainable Development Goals (SDGs). Aligning ourselves to this progressive global movement will support our efforts to be accountable and to demonstrate to our customers and colleagues the ways in which our services positively impact on people's lives. As we embed the goals further, we hope to draw out the direct connections between our activities and the positive influences we can have, on a local, national and global scale.

SUSTAINABLE DEVELOPMENT GOALS

We summarise our plan's alignment with the SDGs on **page 12**.

Chapter 1. Executive summary (continued)

3. Giving consumers and stakeholders a stronger voice

The views of our customers and stakeholders have been critically important to the development of our plan. The role the CEG and Ofgem's RIIO-2 Challenge Group have played in reviewing and challenging our stakeholder engagement – and our response to the feedback we have heard – has also significantly strengthened our plan.

Alongside our 'business as usual' engagement, we have created a bespoke engagement strategy which has helped us to gather informed, actionable and specific feedback to guide our direction of travel for GD2.

Our engagement activities have encompassed:

- engagement with more than 21,000 consumers, both face to face and online;
- additional acceptability testing with c.1,000 customers during summer 2019;
- willingness to pay research on our business plan commitments with c.1,000 customers;
- working alongside partners and others to access hard-to-reach stakeholders, including interviews with 100 vulnerable customers;
- collaborating with other gas networks to reach national and strategic stakeholders;
- analysis of 1.45 million pieces of customer data each year (on average) by our business intelligence tool.

Our approach has helped us better understand what customers know and think about our services, and how they would like them to evolve. This feedback has been through comprehensive triangulation, giving us further insights into customers' priorities.

Some feedback has been in line with expectations, around safety and reliability, our mains replacement programme and support for customers in vulnerable situations. However, the importance customers place on the environmental impact and sustainability of our network was stronger than ever before. This, along with the challenge from the CEG, has heavily influenced our decision to align ourselves with the SDGs.

Our approach, validated by triangulation, also allows us to clearly demonstrate that the 25 commitments we are making in GD2 reflect the wants and needs of our customers and stakeholders. Our willingness to pay research showed overall acceptance for our customer bill and efficiency proposals.

Click **Appendix 1E** for a summary of our responses to the RIIO-2 Challenge Group feedback in July and October.

4. Our customer commitments

Our plan has been summarised here into the three Ofgem output categories, in addition to our own important category of value for money.

- Meeting the needs of consumers and network users
- Delivering an environmentally sustainable network
- Maintaining a safe and resilient network
- Delivering value for money

Chapter 1. Executive summary (continued)

Meeting the needs of consumers and network users

Customers want us to listen and act on what they say and to deliver high-quality, fair and reliable services for all, including those in vulnerable situations.

Customers want to receive the high-quality and inclusive services they need

In GD2, we will continue to develop our people focused culture, with its emphasis on delivering excellent customer service for all. Stakeholders have told us to maintain current performance levels, which will prove challenging as we continue to respond and adapt to changing customer expectations. Those at our regional workshops discussed the value of looking outside our sector for best practice and comparisons, as this helps engender trust.

We take pride in being one of the top performers for customer service in all UK sectors, with an ICS score of 93.6. We are also the first gas distribution network (GDN) to be accredited against the British Standard for Inclusive Service Provision (BS 18477). These accreditations allow us to benchmark ourselves against the best companies in the UK. They also enable us to look beyond the Ofgem standards that we already use to compare our performance against that of other GDNs, where we are consistently first or second.

Our commitment

Maintain our ICS accreditation and the British Standard for Inclusive Service Provision. We propose these as bespoke reputational outputs.

Customers living in vulnerable situations want us to further tailor the support we provide

Given the importance of our services to vulnerable customers, we undertook a 'deep dive' engagement programme in three phases where we spoke to customers with a range of vulnerabilities, as well as their carers. An emerging theme from this research was a growing need to understand emotional vulnerability. This research showed that stakeholders, including the Critical Friends Panel, want us to work harder to promote the PSR in our network, and asked us to collaborate more closely with other utility companies. Social media PSR sign-up trials in GD1 have proven highly effective and efficient, and will be rolled out into GD2.

We hope to continue our collaboration with regional electricity and water companies in GD2 to support customers living in vulnerable situations. We had significant success in GD1, working together to drive PSR sign-ups and jointly leading our first ever 'Stronger Together' conference with WPD and Welsh Water.

Our commitment

Work alongside partners and carer networks to increase the number of PSR sign-ups by 200% to 12,000 per year, compared to 2018/19.

Our commitment

Continue our leading work in data sharing agreements, with the aim of aligning the gas, water and electricity sectors into a virtual common PSR, while working towards a single PSR for all utilities in GD3.

Customers want us to support people in fuel poverty and to raise awareness of carbon monoxide (CO)

Stakeholders have consistently asked us to support those in fuel poverty, and to continue raising awareness of CO. This is one of the top five commitments customers were willing to pay more for. Fuel poverty is particularly relevant in our region, where in some areas over 25% of the population are classified as living in fuel poverty, compared to an 11.1% national average[3]. Customers had conflicting views about our role in raising awareness of CO, therefore we have built our plan on a cost benefit analysis (CBA) approach that includes awareness raising and targeting CO alarm distribution to the most vulnerable.

Our commitment

Further support vulnerable and fuel poor customers by investing £750,000 a year in wide-ranging initiatives with partners and increasing CO support measures – almost doubling our GD1 investment.

3 Click for the **BEIS Fuel Poverty Report, June 2018**.

Customers want us to listen to and act on what they say

Across our diverse communities there are around 1 million people of pensionable age, 700,000 people living in rural areas, and nearly half a million homes in fuel poverty. We must understand our customers better if we are to meet their diverse needs. Involving customers directly in the development of this plan firmly meets our customers' desire to give their opinions on our plans and our work.

Our commitment

Evolve our GD1 Critical Friends Panel and create a new GD2 Citizens' Panel, in a 'centrally facilitated, locally delivered' approach to enhanced engagement.

Customers want us to keep the network safe, making sure gas is paid for fairly by all those using it

The theft of gas (customers taking gas illegally) has been an important theme at regional workshops. The driver for this has been safety and ensuring that gas is paid for by the user, not charged in other customers' bills. We have been one of the leading networks in identifying, investigating and recovering theft of gas in the UK, and we will be increasing our focus in this area further by using industry data and additional resources. Both SMEs and domestic customers confirmed that they were willing to pay for this.

Our commitment

Do more to proactively identify theft of gas to protect the safety of our customers and to support fair charging; we propose a bespoke financial incentive to support this.

Delivering an environmentally sustainable network

Customers care about the environment and want us to act to make sure they have a clean, reliable and affordable source of energy in future.

Customers want us to improve the environment

We have always taken steps to minimise our impact on the environment and to make sure that our network is sustainable for the future. In developing this plan, our customers, stakeholders, the independent CEG and Ofgem's RIIO-2 Challenge Group have challenged us to be even more ambitious.

As part of our commitment to sustainability, we will embed this across our entire business. We are making a commitment to further reduce the less environmentally friendly impacts of our activities and to increase the positive social and environmental impacts.

80%

reused and recycled waste by 2026, with zero waste sent to landfill by 2035.

Our increased focus on sustainability will be underpinned by the UN SDGs, with a promise to report against these going forward. We are passionate about taking responsibility for sustainability matters in areas that are beyond our direct control. We work with our supply chain, partners and other stakeholder groups to effect change in this area.

Our commitments

Align our priorities to the relevant UN SDGs.

Invest £6.8m to assess, manage or reduce the negative impacts of historical gas works at around 70 sites in our communities; we propose a bespoke price control deliverable to support this.

Our stakeholder research clearly demonstrated that the environment is becoming increasingly important. The issues were wide-ranging, including a continued focus on reducing network leakage (which accounts for 96% of our carbon emissions) and the view that we should not ignore smaller elements of our carbon footprint which impact local communities, such as waste and transport. Reducing waste was the second highest commitment our domestic customers and SMEs were willing to pay for.

Our commitments

Reuse and recycle at least 80% of our waste by 2026 and send zero waste to landfill by 2035, to achieve our ambition to be a zero waste company by 2050.

Further reduce gas shrinkage by 10% against the 2021 target value of 454,000 tCO_2 through the continued replacement of over 400km of old metal pipe and 20,000 services each year – the equivalent of permanently taking 46,000 cars off the road.

Move 75% of company cars to hybrid or ultra-low emission vehicles by 2026, explore green alternatives for our commercial fleet, and reduce mileage to achieve a zero emissions fleet by 2035 – supporting biodiversity and improving air quality.

Customers want to know they can trust us to deliver a low-carbon, reliable and affordable source of energy in future

We have undertaken extensive research and stakeholder engagement to consider the future of energy, and have developed a vision of a reliable, affordable, sustainable and decarbonised future. This whole systems vision combines hydrogen cities, green gas and smart hybrid heating systems, all working to keep bills low, maintain reliability and minimise householder disruption. Industry workshops highlighted that stakeholders want us to continue our innovative focus on integrating alternative gases into the existing network and to ensure that any new low-carbon solutions are safe.

National stakeholders involved in our engagement programme called for a 'national conversation' about the future of heat. The gas networks are viewed as central to promoting this, and helping consumers understand the need for change and the realistic options.

Our commitments

Deliver a net zero ready network by 2035.

Invest in innovation to support the national strategic energy challenges, working collaboratively with Ofgem, BEIS and the wider industry.

Maintaining a safe and resilient network

Customers want a safe and reliable gas network that is responsive to changing demands and challenges.

Our customers' number one priority is to continue knowing their gas network is safe and reliable

Throughout GD1, safety has consistently been a priority for our stakeholders. Our research found that maintaining a safe and reliable gas supply was the number one priority, with a clear expectation that we will maintain our excellent performance in responding to emergencies, and continue to replace old and leaking pipes. In our most recent willingness to pay research, attending emergencies was the most important commitment and the one customers and SMEs were most willing to pay more towards.

We have met all safety standards set by Ofgem and the Health and Safety Executive (HSE) in GD1, and have also been classed as an exemplar performer in our safety leadership by the HSE. We are proud to be fully delivering our mains replacement programme in GD1, making our network safer for our customers in the process.

We are committed to developing our digitalisation strategy throughout GD2 in collaboration with the wider industry to provide more tailored services for customers.

Our network is also resilient for the longer term, as our plan delivers a low cost network that supports all future energy scenarios, accommodating hydrogen and synthetic gas with hybrid heating solutions.

Our commitments

Significantly reduce the safety risk for over half a million people living in the vicinity of an ageing metallic gas main, by investing a further £400m in our mains replacement programme.

Continue our risk based approach to asset intervention on our network – with an effective monitoring regime endorsed by the HSE.

Attend gas emergencies in under an hour, on average, to keep our customers safe.

Customers want to be off gas for the shortest amount of time possible

We understand that being without gas inconveniences our customers and we have worked hard to reduce the length of our interruptions in GD1. Our performance is the best in the industry and we will go further than ever to make sure we limit our customers' time off gas. We are committed to delivering a reliable service which now includes a new licence obligation promising an average time off gas of just10 hours, including large incidents.

Our customer research confirmed that compensating customers when things go wrong was very important.

This has led to our new commitment to offer increased compensation above the regulatory standards and new voluntary compensation for interruptions over 12 hours, as well as also paying those who do not qualify under the statutory regulations.

Our commitments

Increase our commitment to reliability by promising an average time off gas of less than 10 hours for unplanned interruptions through a new licence obligation.

Enhanced compensation for failures under the Guaranteed Standards of Performance and voluntarily pay customers £25 if their gas is interrupted for longer than 12 hours. We propose a bespoke penalty only financial incentive to support this.

Customers expect us to protect our network from cyber attacks

We are proactively working to combat the growing threat from cyber attacks. As a business that forms part of the UK critical national infrastructure, we offer essential services, so it is crucial we maintain the integrity and availability of data and business operations to ensure the gas supply is safe and available for consumers.

Our commitment

Increase our focus on preventing and detecting cyber attacks – investing a further £7m[4] in our technology platforms in GD2 to reduce the increasing risk.

4 Excludes costs for NIS improvements which will be subject to a reopener mechanism.

Customers want us to invest in a skilled workforce

Our people are vital to our business performance, and we will continue to invest in the competence and resilience of our workforce. In conjunction with our employees and stakeholders, we have updated our Workforce Resilience Strategy for GD2. Through our engagement, the ageing workforce was raised as a key concern, despite the significant investment made in the upskilling of our workforce in GD1, including the recruitment of almost 200 apprentices. The increasing retirement profile was also recognised, with stakeholders suggesting we must continue to focus on attracting and retaining skilled staff. Our customer research and challenge from the CEG led us to expand our commitment to diversity going forward.

Our commitments

Continue to make our workforce inclusive, ensuring it better reflects the communities we serve.

Deliver a Workforce Resilience Strategy to maintain and evolve the skills of our people to meet our customer needs now and in the future; including ongoing investment in high-quality Apprenticeships to Levels 3 and 4.

£400m

Investment in our mains replacement programme to reduce the safety risk for over half a million people.

Delivering value for money

Customers want us to keep bills at a level they can afford.

Customers want our charges to be as low as possible, while also making sure we stay financially sustainable

Against a backdrop of increasing energy bills and more families in fuel poverty than ever before, a key priority for us is to make sure we keep our component of customers' bills as low as possible. In regional Gross Value Added terms, Wales is considered to be the poorest area in the UK (last out of 12), with the south west of England 6th.

We are recognised in Ofgem's latest annual report as being one of the most efficient networks, with our charges among the lowest of all the gas networks. Our willingness to pay research showed overall acceptance for our customer bill and efficiency proposals, alongside maintaining our current high performance levels.

Our commitments

Keep network charges down to the lowest practical level, maintaining the average GD1 household bill of £133 a year into GD2.

Continue to improve efficiency levels, targeting an efficiency challenge of 0.5% per year – to make sure that customers get best value for money, saving a further £18m over GD2.

Customers support our spending on innovation and expect us to collaborate

Through GD1, the multitude of innovations we have implemented have clearly helped to control our costs efficiently, resulting in lower network charges. Similarly, the use of our unique simulation tool, the 2050 Energy Pathfinder, has been highly effective in modelling future energy supply and demands across the communities we serve. Our innovations have benefitted customers both directly and indirectly, and we will continue to seek innovative solutions to energy issues going forward. This includes a focus on supporting those living in vulnerable situations.

Our commitments

Ensure that the investments we make today will support future energy scenarios and therefore represent a 'no regrets' energy solution.

Continue to invest in innovation, working with around 500 external organisations during GD2 (compared to 350 in GD1) and sourcing over 50% of our ideas from outside of our business.

£18m

money we will save in efficiency savings in GD2.

Innovation rolled out to BAU in GD1 and planned for GD2 is denoted by this logo throughout the plan.

5. How costs and investments are changing

In addition to engaging with our customers and stakeholders to develop our commitments, we have been considering in detail the expenditure we will need to deliver these in GD2. The following table describes our expenditure proposals for GD2 against our expenditure in GD1.

Average financial expenditure in GD1 and GD2

£m 2018/19 prices	Examples of expenditure	Average annual GD1 spend	Average annual GD2 spend	Difference
► Controllable opex	Attending gas escapes, and repairing and maintaining an ageing network.	92.0	96.9	4.9
► Repex	Replacing metallic mains with plastic pipes.	80.0	88.4	8.4
► Capex	Investment in assets such as our network, plant and equipment.	52.6	51.1	-1.5
► **Totex**	**Business as usual total expenditure.**	**224.6**	**236.4**	**11.8**

Ofgem has ranked us as one of the most efficient GDNs in GD1, supported by its regression analysis.

In arriving at our GD2 totex requirements, we have built our plan using the unit costs we have incurred in GD1, carrying forward the efficiency savings from GD1 into the GD2 cost base. Between GD1 and GD2, our average controllable totex is set to increase by £11.8m as a result of the following:

Mains replacement contract. Benefits achieved under our eight-year alliance contract, which resulted in our partners incurring costs they could not charge to us under a pain/gain sharing arrangement, will not be achievable at the same level in GD2.

Mains replacement workload and technique. To deliver the risk reduction required by the HSE, work is moving to extremities of our network, and to smaller schemes where we lose some economies of scale.

We will also need to use the more expensive 'open cut' technique much more frequently – where the cheaper insertion technique is not viable.

LTS investment. The requirement to replace a 13km stretch of our LTS network during GD2. In GD1, we were able to maintain the health of this network through intervention work, rather than full-scale replacement.

Loss of non-formula metering work. Unlike in GD1, we have no ability to defray some of the necessary 'downtime' of emergency First Call Operatives (FCOs) to support 24/7 cover into paid metering activity outside the regulated business.

Efficiency. As part of our commitment to continuous improvement, we will deliver a 0.5% per year compounded efficiency challenge, higher than the 0.3% UK economy forecast in GD2 – equating to 3% a year in 2025/26. This is in addition to the GD1 efficiencies that will be carried forward into the GD2 cost base.

Chapter 1. Executive summary (continued)

6. Ensuring a financeable network

We are determined to deliver excellent value for money services for customers, as we have done in GD1. To do this however, we must have a financially sustainable business – one that is also capable of delivering fair and reasonable returns to our investors.

Because the business is efficient, fully invested with no regulatory output backlogs, and has an efficient highly secured capital structure, we are confident bills can continue to be minimised. For GD2, we expect the headline annual average domestic bill to be flat in real terms with GD1.

However, despite being one of the top performing networks with some of the lowest charges, cash returns to Shareholders in GD1 have been almost a third lower than Ofgem's allowed return of 6.7%. This is due to a significant shortfall in the allowance for cost of debt.

Financeability

Our financeability assessments affirm that our WWU business plan should be financeable, but that it would not be if Ofgem's current assumptions of cost of capital were applied, ie under the Ofgem Actual Company plan assumptions. We also find that when assessed at a target BBB+ rating level, Ofgem's Notional Company plan is financeable for GD2, but we have significant concerns about its longer term financeability.

We disagree with Ofgem's stated position on its statutory duty in respect of financeability.

We argue that there is a clear duty placed on Ofgem to assess against the particular circumstances of each real life actual company. It cannot be considered on the basis of a purely Notional Company if this does not reflect real circumstances. We also do not accept that financeability is properly discharged by accelerating significant amounts of revenue from future control periods through NPV neutral adjustments into GD2.

Cost of capital in GD2

Our assumptions for cost of capital for GD2 are based on extensive work with independent consultants. For example, we have submitted reports to Ofgem from independent experts Oxera[5] which affirm that our debt and derivatives were efficiently undertaken and incurred. As submitted to Ofgem, our assumed cost of equity is at the lower end of the range advised by Oxera to the Energy Networks Association in November 2019.

Customer bills

We are determined to keep our element of charges as low as possible, at an average of £133 in GD2, in line with the GD1 average. This is consistent with a fully invested business, efficient business operations and capital structure, which serves the needs of our consumers. Had our efficiently incurred cost of debt been appropriately funded through GD1, average charges would have increased by £10 from £133 to £143 (2018/19 prices). However, Shareholders have instead borne this cost.

5 Oxera report, entitled 'RIIO-2 preparation: Cost of Debt' dated 26.04.19.

Our GD2 customer bill includes the funding of our efficiently incurred debt, as well as necessary increased expenditure and the NPV neutrality adjustment from the move to inflating by CPIH, instead of RPI. These increases are subsequently offset by reductions resulting from increases in the number of consumers served, and the share of GD1 outperformance no longer being paid for by customers.

Cost of capital

Real CPIH stripped	WWU business plan GD2	Ofgem actual company GD2
Allowed cost of debt	5.25%	1.93%
Allowed cost of equity	6.1%	4.80%
Notional leverage	60%	60%
Allowed WACC	5.59%	3.08%

7. Business plan commitment

Our business plan has been through three elements of assurance:

- **Ambition.** Assurance on the level of ambition in our plan by our full Board, including our Independent Non-Executive Directors. The Board's review has encompassed the vision and strategic direction of the plan, as well as cost and financing proposals. In addition, they have reviewed the ambition of the outputs and commitments, the new CVP and other areas of ambition, including the Environmental Action Plan and net zero ready vision. They conclude that this business plan is ambitious and represents excellent value for money for customers – the delivery of which is conditional on the totex within this plan being fully funded.
- **Accuracy.** Independent management assurance on the accuracy of our plan has been undertaken by KPMG. They performed a combination of review and comment tests, and agreed upon procedures in relation to the narrative in the business plan, the supporting data tables, the Network Asset Risk Metrics tables, the Cost Benefit Analyses and a number of the appendices. The reviews included checks for accuracy, consistency and completeness.
- **Efficiency.** Assurance on the efficiency of our plan was undertaken by Oxera using the benchmarking data available for historic costs, our independent reports, the Total Factor Productivity forecasts for the UK and other relevant evidence. They have concluded that based on their approach of a macro economic review, our costs are relatively efficient and consistent with underlying economic assumptions.

Based on our track record, we are confident we can deliver the plan. To demonstrate our business plan commitment, we will closely align Executive and Management team objectives with the delivery of our GD2 commitments, with up to 50% of executive bonuses attributed to this.

Click **Appendix 1F** for Board assurance on Ambition.
Click **Appendix 1G** for KPMG assurance on Accuracy.
Click **Appendix 1H** for Oxera assurance on Efficiency.

Chapter 1. Executive summary (continued)

Sustainable Development Goals across the plan

As mentioned earlier in this Executive summary, we are aligning ourselves with the UN SDGs in GD2 to illustrate our commitment to being a sustainable network.

We are also aligning ourselves with the Well-being of Future Generations (Wales) Act.

We want to embed sustainable processes across every area of our business, making sure that we are doing our best to limit our negative and improve our positive local, national and global impacts – and report on our progress. In this section, we illustrate how our plan is aligned with the SDGs. The tables map the SDGs against our plan, showing how our activities will continue to deliver on the UN SDGs as we move into GD2.

Stakeholders have shown broad support for our commitment to aligning our priorities to the UN SDGs based on nine engagement events with c.2,200 stakeholders.

Generally, stakeholders were in favour of aligning our plan to the SDGs, and our acceptability testing confirmed that 65% felt our commitment was acceptable to them. They want our alignment with the SDGs to deliver tangible environmental benefits that can be measured and want to see us working more collaboratively with the electricity sector. Expert stakeholders were particularly keen to see carbon emissions at the forefront of our considerations, and in general, the feedback received suggested that stakeholders understand that some goals are more applicable to us than others.

The independent CEG challenged us to go wider than the original six primary goals we had identified, and our plan now aligns to all 17 goals. We still have seven priority goals that we believe we can influence the most, but we will endeavour to work towards all of the goals through our company ambition, priorities and values during GD2.

Click **Appendix 1I** for the UN SDG methodology.

Click **Appendix 5F** for further information on our engagement.

Our commitment

Align our priorities to the relevant UN SDGs.

SDGs	How our plan aligns to the SDGs
1 NO POVERTY	– Committing to the Real Living Wage. – Delivering long-term, sustainable employment, including Apprenticeships. – Offering support to those in fuel poverty with our Hardship fund and Healthy Homes, Healthy People project. – Funding first time gas connections to fuel poor households via our Fuel Poor Network Extension Scheme (FPNES). – Rolling out our Community project fund.
2 ZERO HUNGER	– Offering support to those in fuel poverty with our Hardship fund and Healthy Homes, Healthy People project. – Handing out emergency food packs. – Funding first time gas connections to fuel poor households via our FPNES. – Rolling out our Community project fund.
3 GOOD HEALTH AND WELL-BEING	– Responding swiftly to emergencies. – Promoting and increasing sign-up to the Priority Services Register (PSR). – Raising awareness of the importance of positive mental health. – Partnering with the emergency services around CO safety. – Targeting our provision of CO monitors to those most in need. – Educating communities on gas safety. – Installing locking cooker valves. – Maintaining the wellbeing of our colleagues via an extensive Wellbeing Strategy, supported by comprehensive Occupational Health services.
4 QUALITY EDUCATION	– Educating school children on the risks of CO. – Working with universities to develop innovative ideas and to better understand consumers. – Upskilling our workforce through numerous training opportunities. – Providing apprenticeship opportunities.

SDGs	How our plan aligns to the SDGs
5 GENDER EQUALITY	– Positively responding to the gender pay gap. – Evolving our Diversity and Inclusion Strategy. – Promoting diversity and equality within the workplace; encouraging more females to consider an apprenticeship and careers in engineering.
6 CLEAN WATER AND SANITATION	– Monitoring and managing contaminated land to ensure no risk is posed to controlled, surface and ground waters.
7 AFFORDABLE AND CLEAN ENERGY	– Reinforcing our network via our mains replacement programme to limit leakage. – Preparing our network to transport green gases. – Committing to a net zero ready network by 2035. – Promoting best practice via a Wales Green Gas Panel. – Funding first time gas connections to fuel poor households via our FPNES. – Offering support to those in fuel poverty with our Hardship fund and Healthy Homes, Healthy People project.
8 DECENT WORK AND ECONOMIC GROWTH	– Maintaining a sustainable and competent workforce. – Developing the skills of our workforce by providing comprehensive training programmes to upskill and multiskill colleagues, as well as apprenticeship and graduate opportunities. – Attracting and retaining the right talent to deliver our commitments to customers and communities. – Maintaining secure systems and our ability to control our intellectual property to ensure economic growth. – Working hard to provide employment opportunities to service leavers, parent returners and other 'harder to reach' groups.

Chapter 1. Executive summary (continued)

SDGs	How our plan aligns to the SDGs
	– Introducing new technologies to enable more customer feedback. – Continuously improving our services, ensuring we continue operating a safe and reliable network. – Innovation becoming business as usual. – Developing a quality, reliable infrastructure through new connections. – Increasing green gas supplies, CMG, hybrid heating systems and whole system solutions. – Replacing old metal pipes with polyethelene ones to future proof our network. – Limiting risk and maintaining our assets. – Upgrading GIS and SAP systems to maximise our understanding of asset performance and risk. – Further evolving our cyber security strategy to secure the IT network.
	– Recognising customers' needs and requirements, including vulnerable customers, making sure 'no one is left behind'. – Promoting and increasing sign-up to the PSR. – Fostering a multi-generational workforce. – Promoting diversity within our workforce by evolving our Diversity and Inclusion Strategy.
	– Working closely alongside stakeholders and community groups. – Committing to a net zero ready network by 2035 and net zero by 2050. – Communicating regular updates on the progress of our works. – Engaging with local authorities and customers when planning work. – Funding first-time gas connections to fuel poor households via our FPNES. – Rolling out our Community project fund. – Supporting communities through match-funding and sponsorship. – Offering support to those in fuel poverty with our Hardship fund and Healthy Homes, Healthy People project. – Supporting the development of hydrogen cities and CMG transport. – Improving safety and reducing emissions via our mains replacement programme.
	– Market testing goods, works or services that have a value above £5,000 and are sourceable. – Ensuring procurement expenditure is considered 'fair and reasonable' as evidenced by use of external benchmarks. – Recycling our pipe off-cuts. – Continuing our investment in the replacement of inefficient iron mains. – Investing in minor and major refurbishments, rather than replacement. – Ensuring the resilience of our assets. – Tackling the theft of gas. – Reducing the amount of spoil to landfill. – Increasing the amount of recycled aggregate used. – Reducing the amount of office waste and paper usage.

SDGs	How our plan aligns to the SDGs
	– Delivering our Environmental Action Plan. – Analysing climate change adaptation methods. – Supporting future energy scenarios. – Enabling hybrid technologies. – Carbon offsetting. – Meeting our decarbonisation targets, committing to a net zero ready network by 2035 and net zero by 2050. – Preparing our network to carry green gas. – Reducing emissions due to leakage, via our mains replacement programme. – Undertaking climate change mapping. – Encouraging and influencing our supply chain to reduce carbon. – Understanding our impact on air quality, whilst planning work.
	– Monitoring and managing contaminated land to ensure no risk is posed to controlled, surface and ground waters.
	– Addressing contaminated land risk. – Reducing waste generation that is sent to landfill. – Planting five trees for every one we have to cut down. – Committing to improve the environment via our Biodiversity pledge. – Preserving and enhancing the natural capital in our environment.
	– Working to combat cybercrime to help safeguard our network and the communities we serve. – Safeguarding customers' data. – Managing network and assets securely.
	– Maintaining and forging new partnerships across Wales and the south west of England to ensure we deliver a sustainable customer service to everyone in our network, eg local authorities, developers, charities, subject experts. – Collaborating to share best practice and develop innovations. – Engagement with the Welsh Government on fuel poverty and decarbonisation. – Investing in stakeholder engagement and collaboration with local and national institutions such as Cardiff University, Cornwall Energy, Freedom, BEIS, Energy Network Association, etc. – Creating a new Citizens' Panel to seek feedback, co-create solutions and measure success.

Chapter 2. Our consumer value proposition CVP

1. Highlights of our plan

- Building on our performance in GD1, our customers will benefit significantly in GD2 from the added value services we are offering. Our services will go above and beyond the minimum requirements expected of a gas distribution network.
- We have tested our commitments with our customers and assessed the value, leading to our Consumer Value Proposition (CVP). The CVP totals over £122m in GD2 and a further £20m in GD3 and beyond.
- To measure the value of our services, we have used tools that we had already developed in GD1. In particular, our industry leading Social Return on Investment (SROI) tool helps us understand and measure the value we are delivering to different consumer groups. The CVP is an extension of this approach, which we welcome.
- Our proposals have been independently assessed and validated by Sia Partners, and were reviewed by the independent CEG.
- We will use our CVP models in GD2 to evaluate the services we have delivered, compared with our forecasts. We also commit to use the models to drive business decision making when weighing up different service options and evaluating new programmes of work.

CVP All CVP areas are denoted by a CVP logo across the plan.

2. Introduction

This chapter summarises aspects of our plan that go beyond our minimum requirements and offer additional benefits and value for money to our customers and to wider society. The benefits are expressed in terms of the benefits in GD2, GD3 and, where applicable, beyond GD3 to 2050. We also identify which customer groups will benefit.

Click **Appendix 2A** for our CVP summary.

Our methodology and outcomes have been independently substantiated by Sia Partners and reviewed by the CEG.

Click **Appendix 2B** for a letter from Sia Partners independently substantiating our CVP.

Customer and stakeholder feedback

We have reviewed the commitments we are making in our business plan to consider areas that qualify under the CVP as being above 'minimum requirements'. These commitments have been tested with our customers and stakeholders during our business plan engagement, and more detail is provided in the appropriate chapters.

We tested our approach with the CEG in August 2019 and incorporated more detail into the commitments. We also agreed to produce a supporting appendix and CBA models for each CVP line.

Our approach

As a business we have always used cost benefit analysis (CBA) to evaluate our assets and to direct decision making. The CEG encouraged us to go further, by ensuring that our activities provide a net financial or social benefit to customers. In response we invested in our SROI tool. We used the tool initially to evaluate specific aspects of our social obligations.

We were pleased with the value the tool delivered, and therefore welcomed the requirement from Ofgem to evaluate our CVP. We were able to adapt the SROI tool to encompass wider priorities across the full plan.

The SROI framework builds on traditional CBA by also measuring and accounting for the qualitative social impacts of a project, as well as the direct financial benefits for a customer. This is done by using financial proxies to quantify social benefits that are not generally monetised.

CVP **£122m** Consumer Value Proposition in GD2.

The tool and its components are designed in line with the HM Treasury Green Book (compiled by the UK Government to help organisations standardise appraisal methods to justify public spending); and guidelines set by the UK Cabinet Home Office for SROI.

Click **Appendix 7C** for our measuring benefits methodology and a more detailed description of our SROI model.

Most benefits were measured using our SROI tool. Each CVP has an SROI model and a supporting Appendix in which the assumptions and evidence to support the financial and social processes are detailed.

Our CVP proposals

The following table summarises our overall CVP. For each activity we show how we have determined the value – using the SROI to assess the financial (£) value and/or the social value.

A summary is provided for each output category of our business plan below.

Summary of our CVP proposals (net value, 2018/19 prices, £m)

Topic	Financial	Social	GD2 net total	GD3 net total	Future net total
Customers and network users	✓	✓	72.9	7.6	1.2
Environmentally sustainable network	✓	✓	31.4	11.4	0.0
Safe and resilient network	✗	✗	0.0	0.0	0.0
Value for money	✓	✓	18.0	0.0	0.0
Total			**122.3**	**18.8**	**1.2**

Chapter 2. Our consumer value proposition (continued)

Delivering for customers and network users

CVP

We take pride in the fact that we already deliver UK leading service. During GD2, our customers will benefit further from our increased focus in this area. This will include less disruption by reducing time off gas and continuing to pay more compensation than we are required to pay – in recognition of the inconvenience caused when things do go wrong.

We will provide further support for our communities through our volunteering programme, giving staff the opportunity to raise money for charities which we will match.

Our support for customers in vulnerable situations will be greatly enhanced. We are providing more Customer Support Officers (CSOs) on the ground who will be knocking on doors and providing bespoke support where it is needed. We are also increasing our efforts to provide support by encouraging people to sign up to the Priority Services Register (PSR), including by working with other utilities and partners.

In addition, increased numbers of partnerships will help to maximise the income for more people in fuel poverty, as well as protecting people from carbon monoxide.

We will go beyond our minimum requirements to identify and resolve theft of gas cases, thereby ensuring that customers in general are not funding the few.

Delivering for customers and network users (net value, 2018/19 prices, £m)

Topic	Commitment	Value proposition	Financial	Social	GD2 net total	GD3 net total	Future net total	Net benefit per £1 invested
Service levels	Enhanced GSoPs and voluntary payments Click Appendix 2C1 Click Appendix 2C2	Additional payments to customers when we fail to provide an agreed level of service above statutory requirements.	✓	✗	0.32	0.00	0.00	£320k additional payments to customers
	Interruptions compensation Click Appendix 2C3 Click Appendix 2C4	Voluntary payments for customers left off gas for more than 12 hours.	✓	✗	0.45	0.00	0.00	£450k additional payments to customers
	Volunteering in the community Click Appendix 2C5 Click Appendix 2C6	Wellbeing of volunteers and communities and value of volunteers' time and match funding.	✓	✓	0.2	0.00	0.00	£204k value to communities and organisations
Vulnerability 'use it or lose it' allowance	Fuel poverty Click Appendix 2C7 Click Appendix 2C8	Tackling fuel poverty through income maximisation, tackling energy and water debt/tariffs, and energy efficiency savings due to measures and advice.	✓	✓	7.32	5.03	0.10	£11.71
	Carbon monoxide Click Appendix 2C9 Click Appendix 2C10	Safeguarding customers' lives and health through CO awareness and provision of free CO monitors.	✗	✓	0.28	0.70	0.02	£1.19
	Community Community project fund Click Appendix 2C11 Click Appendix 2C12	Community project fund reaching out to hard to reach groups on energy efficiency, CO awareness and the PSR.	✓	✓	2.70	0.00	0.00	£10.74
	Priority services register (PSR) Click Appendix 2C13 Click Appendix 2C14	PSR referrals and data sharing with utilities leading to customers being safeguarded and prioritised during utility outages. Customers can benefit financially via Warm Homes Discount and access to social water tariffs and discounts.	✓	✓	60.04	0.00	0.00	£270.80
		GDN Collaborative Projects – these have yet to be defined and the benefits assessed.	✓	✓	TBC	TBC	TBC	TBC
Theft of gas	Theft of gas ODI Click Appendix 2C15 Click Appendix 2C16	Tackling theft of gas through proactive work leading to reductions in transportation charges.	✓	✓	1.59	1.90	1.10	£20.67
Total					**72.9**	**7.63**	**1.22**	

Chapter 2. Our consumer value proposition (continued)

Delivering an environmentally sustainable network

CVP

In response to customer and stakeholder feedback, we will increase our focus on reducing our environmental impacts in GD2, underpinned by the UN Sustainable Development Goals (SDGs). We have valued how we adapt to climate change and preserve the natural capital, benefitting the communities that are impacted by our assets.

We also want our network to be net zero ready by 2035 and are committed to sharing our whole systems data and Pathfinder model, benefitting local authorities and community groups.

In addition to our main CVP, we have created a separate net zero CVP which demonstrates the value of our net zero uncertainty mechanism. This is separately identified by the net zero CVP logo.

CVP net zero

All net zero CVP areas are denoted by a net zero CVP logo across the plan.

Delivering an environmentally sustainable network (net value, 2018/19 prices, £m)

Topic	Commitment	Value proposition	Financial	Social	GD2 net total	GD3 net total	Future net total	Net benefit per £1 invested
Environment	Environmental Action Plan Click Appendix 2C17 Click Appendix 2C18	Adapting to climate change, avoiding future costs for customers. Preserving the natural capital, increasing biodiversity and promoting wellbeing. Education of school children in the community on environmental issues.	✗	✓	3.23	0.00	0	£11.22
Data sharing	Whole systems data Click Appendix 2C19 Click Appendix 2C20	The value of our whole systems data to support external projects. The value of our Pathfinder model in supporting external projects.	✓	✗	28.20	11.19	0	£40.37
Total					**31.43**	**11.19**	**0**	

Chapter 2. Our consumer value proposition (continued)

Delivering value for money

CVP

Customers have benefitted through lower bills throughout GD1, including as a result of our ongoing commitment to innovation and cost efficiency. Customers will continue to benefit from this in GD2. We commit to providing financial, service and environmental benefits through our innovation programme. We will also keep bills as low as possible; this includes delivering 0.5% efficiency – resulting in nearly 3% per year by the last year of the price control – which is equivalent to an average saving of £3.6m every year for our customers.

60%

of CVP benefit will be delivered to vulnerable customers in GD2.

We commit to providing financial, service and environmental benefits through our innovation programme.

Delivering value for money (net value, 2018/19 prices, £m)

Topic	Commitment	Value proposition	Financial	Social	GD2 net total	GD3 net total	Future net total	Net benefit per £1 invested
Innovation	NIA vulnerable customers Click Appendix 2C21 Click Appendix 2C22	Supporting customers financially and protecting their health.	✓	✓	0.40	0.0	0.0	£0.45
Efficiency	0.5% efficiency saving	Reduced customer bills through annual 0.5% efficiency commitment.	✓	✗	17.60	0.0	0.0	£17.6m bills reduction
Total					**18.00**	**0.0**	**0.0**	

Distribution of benefits to customer groups

Most of the value propositions in the table above will benefit all domestic and business customers. The table below summarises the total benefit by customer group.

Summary of CVP benefits by customer group (net value, 2018/19 prices, £m)

Customer group	CVP GD2	CVP GD3 and beyond	Total CVP benefit
Domestic vulnerable	72.1	5.5	77.6
Domestic non-vulnerable	5.5	0.6	6.1
Business customers	15.9	2.5	18.4
Off gas households	0.4	0.3	0.7
Local authorities/communities	28.4	11.2	39.6
Total	**122.3**	**20.1**	**142.4**

The majority of our CVP impacts existing (GD2) customers. The theft of gas CVP will reduce gas bills for future customers. Data sharing of whole systems data and the Pathfinder model will support third party projects into GD3.

Distribution of benefits geographically

Most CVP geographic distribution is driven by our business plan workload. Regarding future of energy and data sharing, the distribution of benefits will depend on who and where we're working. So that vulnerable customers benefit in all locations, we will work with partners across all geographies in relation to the 'use it or lose it' allowance.

Independent evaluation

Our SROI tool has been developed, and its correct use and our assumptions substantiated by Sia Partners. Sia Partners has previously developed an SROI tool alongside Ofgem to evaluate the Fuel Poor Network Extension Scheme (FPNES).

The CEG has evaluated outcomes, providing feedback and challenging us to only value service levels or outcomes that go beyond what would be usually experienced by customers. The RIIO-2 Challenge Group commended our commitment and approach to quantification using SROI.

Using the CVP in GD2

We welcome the CVP approach as it provides an opportunity to build further on our existing approaches to evaluating our services and projects. It will help us demonstrate the value of our investments to customers and to wider society and, importantly, will help supplement our decision-making on projects.

To be accountable to customers, we will monitor the outcome of our commitments and the value these provide on an annual basis, as we move through GD2. Where we cannot deliver value we will return funding to customers through the regulatory process. In some cases, this may mean that money will be returned to customers if we do not deliver as we said we would. For example, if we do not spend the 'use it or lose it' allowance for vulnerability and carbon monoxide, or achieve the outputs we have committed to, then the appropriate money will be returned to customers. Similarly if an initiative is not delivering the benefits we anticipated it will either be refocused or stopped. We will use the CVP in our performance reporting going forwards. This includes in the annual Regulatory Reporting Pack commentary and other relevant reports, such as the annual vulnerability report under new licence obligations.

Chapter 3. Outputs and incentives

We are committed to delivering our promises across our full range of services and we use 'outputs' to measure and report on our performance. In GD2 we will further increase transparency and strengthen our accountability to customers and stakeholders.

This chapter explains our proposed outputs for 2021–26. Some of the outputs are common to all GDNs, while others are bespoke to our business, reflecting the specific needs and priorities of our customers.

Each output has associated targets, and this chapter summarises both the targets and the approach we have used to arrive at those targets.

The chapter also outlines the reward that consumers believe is appropriate for achieving or going beyond the target, as well as the penalty that will be applied should we fail to meet that target. These incentive arrangements ensure that customers get best value and are protected from risk should we fail to deliver our commitments.

The chapter is presented in the following sections:

1. Our methodology and approach – the steps we take to determine the outputs, targets and incentives.
2. Our GD2 outputs – the specific targets we have set for each output.
3. Our GD2 incentive package – the rewards and penalties that would apply.
4. Reporting and consequences for non-delivery – the measures in place to protect customers should we fail to deliver on our promises.

Each chapter in this business plan contains a more detailed assessment of the outputs relevant to that chapter.

This chapter is supported by an Appendix that provides a much fuller picture and greater detail on the rationale behind each common output with a bespoke target, and our bespoke outputs.

We would therefore **strongly recommend** that the chapter is read in conjunction with the output justification Appendix.

Click **Appendix 3A** for a more detailed justification of the common outputs with bespoke targets, and our bespoke outputs.

At this price control, Ofgem determined that outputs would be aligned to three overall categories. We support these categories and this chapter presents our outcomes in this way. The three categories are as follows:

- Meeting the needs of consumers and network users
- Delivering an environmentally sustainable network
- Maintaining a safe and resilient network

1. Our methodology and approach

This section describes the overarching approach we took, using customer and stakeholder feedback to develop the proposed outputs, targets and incentives for GD2.

Our detailed Appendix demonstrates how each output aligns with the principles for setting outputs that were included in Ofgem's business plan guidance document and further challenges from the CEG.

Setting outputs, targets and incentives

Although the process to determine our outputs and targets is relatively complex, it can be broken down into a series of steps which are described on the following page.

Chapter 3. Outputs and incentives (continued)

Step 1: Define outputs

There are two types of outputs:

- Common outputs – required by the regulator across all GDNs.
- Bespoke outputs – specific to WWU and important to our customers.

Step 2: Define type of target

There are three types of targets for outputs:

- Common outputs with common targets – set by the regulator across GDNs with common targets.
- Common outputs with bespoke targets – set by the regulator across GDNs with GDN specific targets.
- Bespoke outputs with bespoke targets – specific to each GDN.

Step 3: Inform decisions

Customers and stakeholders talked to us about our performance in GD1 and proposals for GD2. We have reflected these needs in determining our outputs and the associated targets.

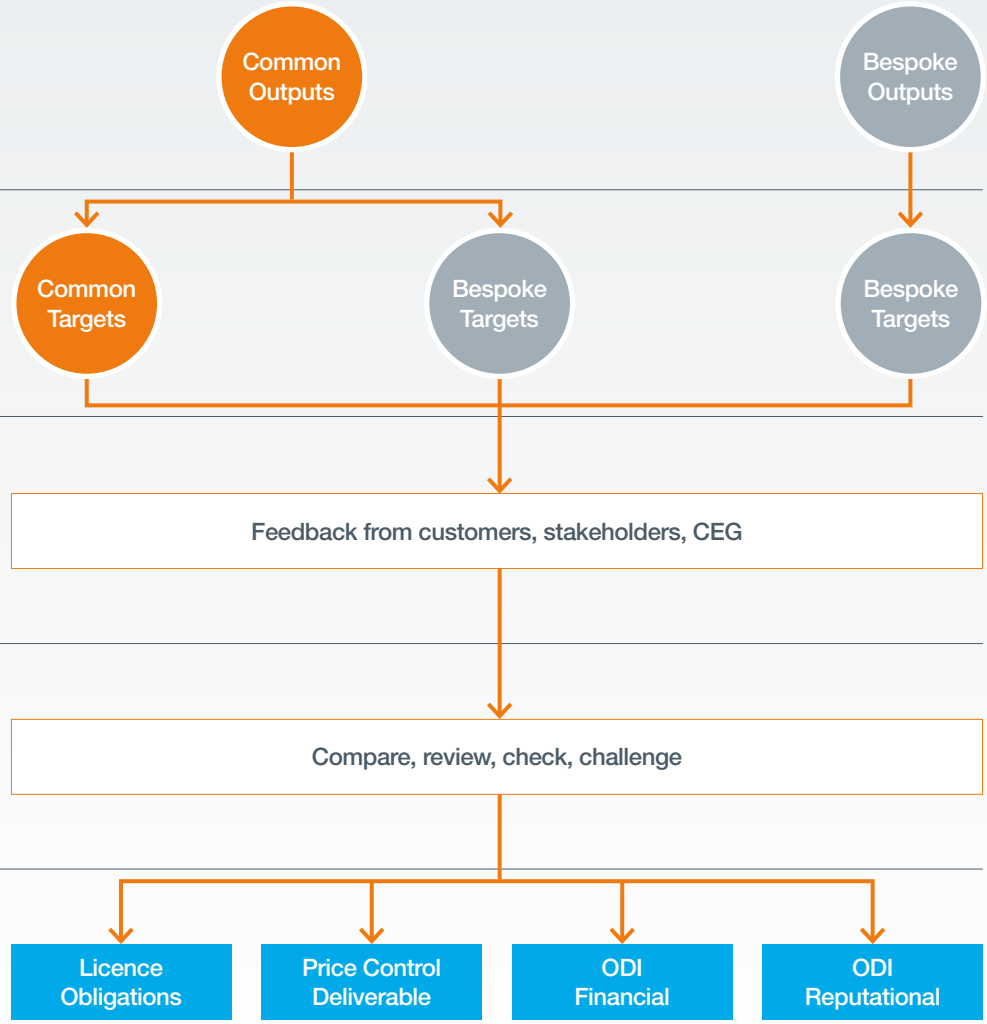
Step 4: Set performance levels

To ensure that our bespoke targets are sufficiently challenging and ambitious, we looked at wide-ranging sources including benchmarking across the sector, our historic performance and consumer views.

Step 5: Determine regulatory mechanism

There are three regulatory mechanisms that govern outputs:

- **Licence obligations (LO)** – set minimum standards; failure could lead to enforcement action and penalties.
- **Price control deliverables (PCDs)** – capture outputs with baseline funded.
- **Output delivery incentives (ODIs)** – apply to service quality improvements beyond the minimum standard (may be financial or reputational).



Chapter 3. Outputs and incentives (continued)

2. Our GD2 outputs

This chapter outlines our targets for GD2 which are summarised below. These are presented according to the three Ofgem output categories. For reference, where a comparable measure already exists in GD1, we also show our current performance.

Further details in relation to the targets for each year of GD2, the cost assumptions we have made and the associated incentive payments/ penalties where a financial ODI is proposed are included within the relevant chapters of this plan. The chapters are signposted in the tables below.

Meeting the needs of consumers and network users

Delivering for our customers is a critically important priority and our outputs are designed to ensure that:

- customers receive a high level of service;
- vulnerable customers are protected and supported;
- those in fuel poverty have access to cheaper heating;
- interruptions are infrequent and the time off gas is minimised;
- we keep people safe by responding to emergencies quickly;
- our service is externally verified to deliver best in class.

Click **Appendix 3A** for more detailed outputs justification.

Meeting the needs of consumers and network users

Common output measures with a common target	Type	Explanation	2018/19 performance	GD2 target	Click for further info
Consumer vulnerability minimum standards	LO	A new LO to identify vulnerable consumers and provide support including partnership working.	Met LO	Meet revised LO	Chapter 7
Consumer vulnerability reputational incentive	ODI R	A new reputational ODI to annually report on the support given to vulnerable customers and host an annual joint GDN showcase event.	New	Annual reporting and GDN showcase events	Chapter 7
Customer satisfaction survey	ODI F	A financial ODI with penalties and rewards based on customer satisfaction survey scores across the three key work areas.	9.18/10	Trials Oct 2019 to March 2020	Chapter 6
Complaints metric	ODI F	A financial ODI with a penalty only to incentivise the timely and high-quality resolution of complaints. Focused on resolution times, repeat complaints, and Ombudsman complaints.	2.51	Ofgem to confirm	Chapter 6
Guaranteed Standard of Performance (GSoPs)	LO	A set of legal minimum standards with associated compensation relating to our core services for interruptions, connections and customer service.	Met LO	Meet LO	Chapter 6
Emergency response time	LO	Licence Obligation to attend 97% of gas emergency calls within 1 hour for uncontrolled and 2 hours for controlled escapes.	99.4%	Exceed LO of 97%	Chapter 6
Common output measures with a bespoke target					
Consumer vulnerability and CO safety 'use it or lose it' allowance	PCD	A 'use it or lose it' allowance to focus on initiatives to support vulnerable customers and raise CO risk awareness.	New	£750k per year fund	Chapter 7
FPNES	PCD	Funding of first time gas connections to eligible fuel poor homes.	1,083 connections	Average of 500 connections per year	Chapter 7
Average restoration time for total unplanned interruptions	ODI F	The average time taken to get supply back on after an unplanned interruption. Major incidents involving over 250 properties will be weighted.	6 hours (average)	Less than10 hours (average)	Chapter 6
Bespoke output measures					
British Standard for Inclusive Service Provision BS 18477	ODI R	Reputational ODI to deliver best practice measured by BSI accreditation for Inclusive Service Provision across our whole business. (GD2 cost £0.075m).	Accredited	Maintain accreditation	Chapter 7
ICS ServiceMark accreditation CVP	ODI R	Reputational ODI benchmarking against the best customer service providers in the UK. (GD2 cost £0.075m).	Accredited	Retain ServiceMark	Chapter 6
Theft of gas CVP	ODI F	A bespoke financial ODI to increase the proactive work we do to tackle theft of gas by commercial and domestic customers. (GD2 cost £0.25m).	£326k	First £250k to customers. £250-£300k to WWU (admin costs) >£300k shared 50:50	Chapter 17
Enhanced GSoP	ODI F	A package of three outputs that maintain our GSoP failure payments which doubled our GD1 statutory payments, while expanding the reach to all connections customers and offering voluntary payments to customers who experience long unplanned or planned interruptions. (GD2 cost £0.	Doubled payments	Maintain GD1 doubled payments	Chapter 6
Voluntary interruptions payments			New	Voluntary payments to customers	Chapter 6
Connections voluntary GSoPs CVP			New	Alignment to connections GSoP for excluded customers	Chapter 6

Chapter 3. Outputs and incentives (continued)

Bespoke reputational ODI – BS 18477 – Inclusive Service Provision

Customer and stakeholder feedback

Providing inclusive customer service is a priority for us. Although stakeholders had mixed awareness of BS 18477, and acceptability for the commitment itself was low, our in-depth engagement and research into vulnerability shows that supporting customers in vulnerable situations has a high perceived value – for domestic customers, in particular.

Ofgem's Vulnerability Strategy also states that networks should demonstrate that services are inclusive and do not penalise anyone. BS 18477 helps us demonstrate this, is recommended by Ofgem, and fosters trust amongst our customers.

Our commitment

Maintain the British Standard for Inclusive Service Provision. We propose this as a bespoke reputational ODI.

We have made a number of ambitious commitments in our business plan to deliver increased support for those in vulnerable situations. In addition, we are committing to a bespoke reputational ODI to continue to achieve accreditation against the UK's British Standard for Inclusive Service Provision across our entire organisation. This will ensure we are continually stretching ourselves and improving our services, delivering on behalf of those who need it most in society.

Click **Chapter 7: Social obligations** for further information. 62

Bespoke reputational ODI – ICS ServiceMark accreditation

Customer and stakeholder feedback

During GD1 we have taken pride in delivering UK leading customer satisfaction, which is externally benchmarked by the ICS through its ServiceMark Accreditation. We are currently scoring 9.18 out of ten for overall service, and our customers have told us that they want us to continue to deliver at this level.

Despite this output receiving conflicting feedback and different levels of acceptability, we know that safety is the top priority for customers – and we can only achieve this through excellent customer service. Given stakeholders' unwillingness to pay more for this, we are not proposing a financial incentive.

Our commitment

Maintain our ICS accreditation. We propose this as a bespoke reputational ODI.

Our response is to commit to a bespoke reputational ODI to maintain our ICS ServiceMark accreditation throughout GD2. This will ensure that we are not only benchmarked against the GDNs but externally benchmarked against UK leading companies. In this way, we will make sure that our customers receive the industry leading service they expect and deserve.

Click **Chapter 6: Customer service** for further information. 52

Bespoke financial ODI – Theft of Gas CVP

Customer and stakeholder feedback

We have performed well in the area of managing gas theft, recovering £2m over the past five years. Customers and stakeholders ranked this ODI inconsistently, with regard to both its importance and its perceived value.

However, given the significant importance customers place on safety and the potential financial benefits available to them, we are committing to do more – proactively working alongside others – to manage the issue of gas theft. We propose an additional financial incentive to support our commitment in this area.

Our commitment

Do more to proactively identify theft of gas to protect the safety of our customers and to support fair charging. We propose a bespoke financial incentive to support this.

We are proposing a new financial ODI which would see customers receiving all of the benefit of the first £250,000 recovered each year. We would then share 50% of everything we are able to recover above £300k at an additional cost of £50,000 a year. This will ensure fair charging going forward, because the gas used will be paid for by the user and not charged as part of everyone else's bill, as well as further protecting the safety of our customers and the public.

Click **Chapter 17: Connecting homes and businesses** for further information. 164

Bespoke financial ODI GSoP and voluntary payments for interruptions and commitments CVP

Customer and stakeholder feedback

During GD1 we have voluntarily paid double the statutory GSoP payment to customers. The new GSoP payments being proposed by Ofgem are lower than these values and continue to exclude groups of connections customers. Stakeholders support higher payments than those proposed by Ofgem, however they are not willing to pay towards this compensation. 62% consider resolving complaints quickly and compensating when things go wrong as 'very important' and a way to facilitate automatic compensation payments was considered crucial. This ODI will allow us to focus on measuring and improving our performance.

Our commitment

Enhanced compensation for failures under the GSoP and voluntarily pay customers £25 if their gas is interrupted for longer than 12 hours. We propose a bespoke penalty only financial incentive to support this.

We will ensure that all customers are treated equally in our connections business and we will pay the equivalent GSoP payment to developers and those seeking an isolation, diversion or gas entry quotations/works. We will also compensate customers for interruptions longer than 12 hours, on planned and unplanned works, and commit to getting gas to the appliances within two hours or to offering a two-hour appointment window.

Click **Chapter 6: Customer service** for further information. 52

Chapter 3. Outputs and incentives (continued)

Delivering an environmentally sustainable network

Our focus on the future and our role in delivering a low carbon network is at the forefront of our business plan. Our targeted outputs will:

- deliver a focus on reducing emissions to help deliver the UK's climate change targets;
- minimise the risk of contamination from historical gas-producing sites to protect people and the environment.

Click **Appendix 3A** for a more detailed explanation of the common outputs with bespoke targets, and our bespoke outputs.

10%
further emissions reduction by 2026.

Delivering an environmentally sustainable network

Common output measures with a common target	Type	Explanation	2018/19 performance	GD2 target	Click for further info
Annual Environmental Report	LO	A new LO requiring GDNs to report their environmental performance through Business Carbon Footprint (BCF) reporting.	New	Multiple targets	**Chapter 14**
Common output measures with a bespoke target					
Shrinkage	ODI F & R	A financial and reputational ODI to measure the volume of gas lost (GW/h) through leakage, theft of gas and own use gas.	351.5GWh	322GWh average per year	**Chapter 14**
Environmental Action Plan initiatives CVP	PCD	A PCD to support GDNs to minimise their environmental impact and reduce BCF.	New	Multiple targets	**Chapter 14**
Bespoke output measures (GD2 cost)					
Land remediation	PCD	A suite of outputs to continue our programme of managing and cleaning up old contaminated gas works sites (GD2 cost £6.8m).	85 land management/ remediation outputs in GD1	85 land management/ remediation outputs in GD2 (70 sites)	**Chapter 14**

Bespoke PCD – land remediation

Customer and stakeholder feedback

Our portfolio of former gas work sites has the potential to significantly damage human health, water bodies and the environment that surrounds them – and we take this risk seriously. Limiting the negative and enhancing the positive impact we have on the environment is a major focus for us as we move into GD2. This is guided by the clear feedback we have received from customers and stakeholders, with over half of those we have spoken to being 'environmentally considerate' or 'environmentally engaged'.

We are committing to a bespoke PCD to assess, manage and reduce historical gas work sites' negative impacts on the communities and environment where they are located. We will commit to investing £6.8m to efficiently and effectively tackle this complex ongoing problem; if we fail to achieve this we will hand this money back to customers.

Our commitment

Invest £6.8m to assess, manage, or reduce the negative impacts of historical gas works at around 70 sites in our communities – we propose a bespoke price control deliverable to support this.

Chapter 3. Outputs and incentives (continued)

Maintaining a safe and resilient network

Our customers expect us to deliver a safe and resilient network. Our outputs in this area will:

- deliver a gas mains replacement programme that reduces the risk of an explosion and minimises our impact on the environment;
- minimise the risk of contamination from historical gas-producing sites to protect people and the environment;
- provide protection from cyber attacks and accidental failures of our technical infrastructure, which could otherwise impact the physical integrity of our assets and lead to data breaches;
- deliver a risk based programme of investment, in our assets, based on accurate data, to minimise the risk of an unplanned interruption to supply or safety related incident.

Click **Appendix 3A** for a more detailed explanation of the common outputs with bespoke targets, and our bespoke outputs.

Maintaining a safe and resilient network

Common output measures with bespoke targets	Type	Explanation	2018/19 performance	GD2 target	Click for further info
Repex – tier 1 mains replacement	PCD	A programme of work that is mandated by the HSE to replace iron metallic mains within 30m of an occupied building by 2032.	Average of 337km per year in GD1	324km per year in GD2	**Chapter 16**
Repex – replacement of services	TBC	The replacement of metallic services to comply with HSE guidance which does not allow a steel service to be reconnected following a mains replacement, or to just repair a service following a leak.	Average of 17,300 per year in GD1	86,740 during GD2	**Chapter 16**
Gas holder demolitions	PCD	A programme of work to demolish redundant gas storage assets.	0	5 during GD2	**Chapter 18**
Network Asset Risk Metric (NARM)	PCD ODI	A common model across GDNs for calculating the monetary value of the risk of assets. This is used to assess the impact on risk from our intervention programme.	£163m	£203m[1]	**Chapter 15**
Cyber resilience	PCD	As a key utility infrastructure provider, we are at risk from a cyber attack that could impact supplies to homes and businesses. We therefore need to ensure appropriate levels of cyber resilience.	NIS regulations did not exist in GD1	£7m	**Chapter 21**
NTS exit capacity	TBC	The value of NTS flat capacity secured to meet 1:20 peak demands against a baseline set in the final proposals. To incentivise GDNs to minimise flows on the NTS to reduce consumers' costs.	£0.46m	Pending outcome of UNC678	**Chapter 18**
Physical security	PCD	Ensuring we meet Physical Security Upgrade Programme (PSUP) obligations and monitor alarms on PSUP sites.	Complied with requirements	No PCD proposed	**Chapter 18**

1 This cannot be compared with GD1, as monetised risk prices have been inflated for GD2 in line with Ofgem guidance.

Chapter 3. Outputs and incentives (continued)

3. Our GD2 incentive package

We have designed a set of incentive mechanisms that will support and promote the effective and efficient delivery of our outputs. Further work will continue throughout 2020 to develop these incentives with Ofgem and other GDNs.

The table sets out the package of financial incentives that we are proposing for GD2. There are two to support us in meeting the needs of our consumers and network users: one environmental sustainability incentive; and two designed around maintaining the safety and reliability of the network.

CVP For every £1 invested to stop gas theft, there is £21 of net customer benefit – totalling a value of £1.6m in GD2.

Financial incentives proposed for GD2

Incentive	Description	GD1 performance 2018/19	Proposed range for GD2	Click for further info
Customer satisfaction	An incentive to drive improvements that deliver great customer service and experience.	Rewarded £2.25m	Under consideration by Ofgem, trial underway Oct'19 to Mar '20.	**Chapter 6**
Complaints metric	An incentive to improve the timeliness and quality of resolving customer complaints (penalty only).	No penalty	Up to – 0.5% of allowed revenue.	**Chapter 6**
Theft of gas CVP	A new incentive to drive identification of consumers not paying for gas consumption, to recover monies due and to start charging them for future usage.	New £327k recovered through back-billing.	Retain 50% of money >£300k recovered.	**Chapter 17**
Shrinkage	An incentive to minimise the volume of gas lost through leakage.	£0.99m	Under consideration by Ofgem.	**Chapter 14**
NTS exit capacity	An incentive to minimise NTS exit capacity bookings and interruption payments to customers on their own networks.	£0.46m	Decision on whether to include incentive deferred until UNC678 has concluded.	**Chapter 18**

4. Reporting and consequences for non-delivery

As a responsible business, and to engender trust among our customers, we will be accountable and transparent in reporting our performance in delivering this business plan and will compensate customers should we fall short.

We will measure and report progress against our outputs and incentives through the annual regulatory reporting process; the details of this will be established through the Ofgem working groups prior to the start of GD2.

We have also made a number of additional commitments in our business plan. These are our promises to customers and we will report our performance against them annually. While they are not all regulatory outputs, they are all individually sponsored by an Executive Director, and the consequences of non-delivery are directly linked to executive pay.

If we fail to deliver our bespoke outputs, the consequences for non-delivery are as follows:

- BS 18477 and ICS ServiceMark – Reputational ODIs – we will return the cost of these accreditations to customers.
- Theft of Gas – Financial ODI – we will charge customers the costs to deliver this until we recover £300,000 in back billing.
- Additional GSoP payments – Financial ODI – these are penalty-only incentives that compensate customers for failures.
- Land remediation – this is a bespoke PCD, which by its nature, will ensure that money is returned to customers if we fail to deliver the outputs.

The consequences of non-delivery of the common outputs and the common outputs with bespoke targets will be in line with the Ofgem guidance and instructions.

As a responsible business, and to engender trust among our customers, we will be accountable and transparent in reporting our performance.

Conclusion

Based on the customer and stakeholder feedback we received in preparing our business plan, we believe that this package of outputs and incentives is what customers want from us in GD2.

They want a value for money, safe and reliable service and an organisation that is reducing its carbon footprint and supporting the decarbonisation of heat in the UK.

Chapter 4. Track record

1. Introduction

This chapter provides an overview of our track record in GD1, including how different groups of customers have been served in GD1. It encompasses not only our performance against regulatory measures but also the areas where we have gone above and beyond for our customers.

To summarise, all domestic and business users have seen increasing safety, reliability, and customer service. We have developed our services for vulnerable customers, not only by safeguarding them during our works, but through signing people up to the PSR, providing CO advice and monitors, offering locking cooker valves, and tackling fuel poverty. The FPNES has helped us to extend the gas network by 36km, reaching off gas communities and homes. Our reach into hybrid heating systems is set to be a key measure in the future of UK heat.

2. Meeting the needs of consumers and network users

Customer voice

We listen to our customers

We are committed to increasing the voice of the customer in order to improve the services we offer.

In GD,1 we worked hard to broaden our reach with stakeholders and started to develop our stakeholder segmentation tool. To gain insights into our customers' needs and wants, we undertook an extensive and comprehensive engagement programme, at the same time as learning from our day to day contact with our customers.

We invested in a TV advertisement, as part of our 'Let's Connect' campaign, which was designed to increase awareness of who we are and to encourage people to connect with us. 21,000 people gave us their views. Other engagement included data mining existing customer data in the business and collaborative engagement on vulnerability.

We have continued to listen and respond to valuable insights from our long standing Critical Friends Panel and bi-annual regional workshops, with a broad range of stakeholders across our entire geography.

The feedback we have received has been wide-ranging and we have made many changes as a result. For example, we acted on feedback on improving customer communication by investing in new Customer Support Officers (CSOs). The CSOs work face to face in the communities we serve to support the individual needs of consumers.

Another example is our response when told we needed to work with partners to provide targeted support and services for those in vulnerable circumstances; this is now a core part of the way we deliver as a responsible business.

21,000

people gave us their views in our 'Let's Connect' campaign.

Customer service

We exceed customer expectations

We are deeply committed to improving our service and are proud to be delivering UK-leading customer satisfaction that is comparable to levels achieved by leaders such as John Lewis and Amazon. This has resulted in us achieving the ICS ServiceMark with distinction, scoring 93.6 out of 100 in 2019.

As measured through the GDN customer survey in 2018/19, we are in the upper quartile of GDNs, achieving 9.18/10 overall compared with 8.69/10 in 2013/14; a direct result of our commitment to improving service every day.

In addition, we have become faster at responding when things go wrong by resolving 84% of complaints on day one (up from 45% in 2013/14). We do not compromise on quality when it comes to our complaint resolution, which is evidenced by very low levels of repeat complaints and the fact that we have had no Ombudsman complaints ruled against us for ten years.

In 2019, we achieved the ICS ServiceMark with distinction.

We focus on the experience of our worst-served customers

While our average overall service is high, we are not complacent and we focus specifically on improving the experience for our worst-served customers. We use sophisticated business intelligence tools for deep-dive analysis to understand where our worst-served customers are and how we need to improve. We use this information to provide targeted training and development for colleagues in specific geographical areas, and we closely monitor improvements in their performance.

When customers are repeatedly interrupted due to poor pressure or water ingress, we use innovative CCTV techniques to pinpoint underlying issues. We have also deployed fledgling technology to isolate and deal with gas escapes in multi occupancy buildings (MOBs), aimed at minimising how many and for how long customers are off gas.We recognise the inconvenience our works can cause and have voluntarily doubled compensation payments to reflect this; one of only two networks to do so.

Social obligations and vulnerability

Among our 2.5 million consumers, many live in vulnerable situations and count on us to understand and respond appropriately. GD1 has seen us make positive strides in this area.

We care about those in vulnerable situations

In Wales, we have the oldest housing stock, one of the highest poverty levels and the lowest average energy efficiency ratings in the UK and Europe. Recognising the challenges our customers face every day, we have delivered vulnerability training to over 1,680 colleagues to help them identify signs of vulnerability, and giving them the tools to provide additional help.

We wanted to test our commitment externally and have become the first GDN to meet the requirements of BS 18477 – the British Standard for Inclusive Service Provision.

First GDN to meet requirements for inclusive service provision.

Chapter 4. Track record (continued)

We work in partnership

Our stakeholders have told us that we need to work with others to deliver the most effective support for those in vulnerable situations; these should be partners who are trusted in the local community. Identifying vulnerability is the first challenge, and one that we are overcoming by working together with Western Power Distribution and local water companies to sign people up to the Priority Services Register (PSR). We now have over 15,000 more people signed up to the PSR since 2015, meaning they have access to the vital support they need.

We are also working with local authorities, health boards, GPs and partners such as Warm Wales, Care & Repair and the Centre for Sustainable Energy to support those in fuel poverty. To offer wider support, we refer customers to trusted partners to support with wider energy efficiency, energy switching and income maximisation advice. Our support has saved 2,000 families a total of £1.3m with energy tips and debt advice, among other things[1] – an average of £650 per household.

We protect customers from CO

Our customers asked us to target our carbon monoxide (CO) advice to those most at risk of poisoning. As a result, we have changed our strategy and now target the youngest and oldest in our communities. Through partnerships and working in schools, we have directly educated more than 100,000 people at risk about the issue and have issued 29,000 CO alarms to our priority customers.

Our investment in innovative data mapping is allowing us to target CO advice and distribute alarms to those who are most vulnerable.

We help to lower heating bills

Given that gas is 75% cheaper than electricity to heat homes, those in fuel poverty benefit significantly from moving to gas for heating. In spite of the challenges of changing criteria for connecting fuel poor customers to the gas network, we are committed to delivering our targets by 2021. As a result, we are proud to be lifting more than 12,000 families out of fuel poverty by the end of GD1 and saving customers £680 a year on their energy bills by partnering with organisations to connect off-grid homes to the gas network.

£680

a year saved by 10,000 families through our Fuel Poor Connections Scheme.

Reliability

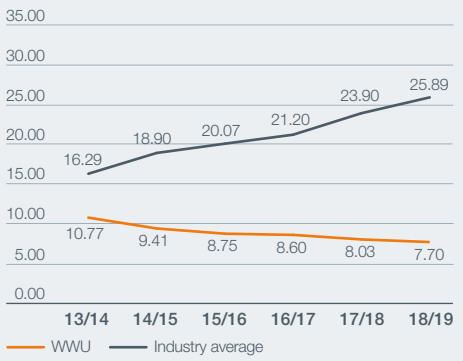
Our customers tell us that reliability is a high priority – 80% of households rely on gas to heat their home, and their feedback was that we need to maintain our GD1 levels of 99.97% network reliability in GD2.

We minimise supply interruptions

To deliver a reliable gas supply, we focus on keeping the number of supply interruptions to a minimum, and in fact our customers only experience an unplanned interruption once in their lifetime.

However, when we do need to interrupt supplies in an unplanned way, our aim is to keep the duration of the interruption to around eight hours on average, compared with the GDN average of 26 hours.

Unplanned interruptions – GD1 cumulative Average duration (hours) excl. large events



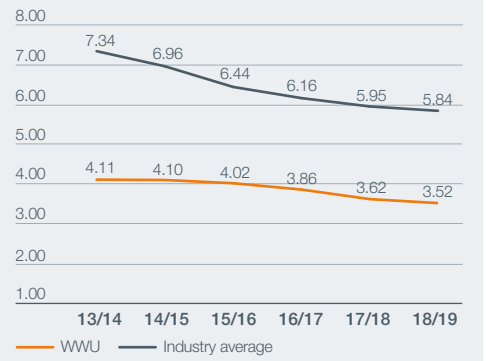
In 2018/19, we average 6 hours for unplanned interruptions. This compared to NGN (7.5 hours), SGN Sc (13.5 hours), SGN So (23 hours), and Cadent at 16 hours (except London at 185 hours).

We recognise the inconvenience caused for customers when we have to interrupt gas supplies as part of our planned gas mains replacement programme.

We are pleased to report that our planned interruptions last just three and a half hours on average, compared with the near six-hour GDN average. We are constantly looking for innovative ways to reduce the time our customers are without gas.

We have, for example, developed an innovative Ductile Iron Window Cutter which reduces the time it takes to replace metallic pipes, minimising the inconvenience to customers.

Planned interruptions – GD1 cumulative Average duration (hours)



We experience severe weather from time to time, but even during the Beast from the East in 2018, we are proud to have maintained frontier performance, despite our network being worst hit by the extreme weather.

99.97%

network reliability in GD1.

1 Between August 2017 and July 2019.

Chapter 4. Track record (continued)

3. Maintaining a safe and resilient network

Safety

We keep our communities safe

Safety will continue to be a constant focus for improvement and is by far the highest priority for all customers and stakeholders. Our replacement of gas mains is prioritised on a risk basis to avoid the devastating consequences of gas explosions. By 2021, our network will be 75% plastic and we will have delivered all of our outputs, unlike some networks that are currently significantly behind on delivery of their programme of work. This is despite the substantial challenges on securing resources in our area (due to large projects such as railway electrification and Hinkley C), combined with the challenge of our resources moving to other GDNs who are paying a premium for these skills.

While we have an hour to attend gas escapes where customers are unable to turn off their gas, our average time to do so is just 45 minutes. We take our regulatory responsibilities very seriously and are one of only three networks to achieve the regulatory targets for emergency response since 2005.

75%
of our network will be plastic by 2021.

We keep our workforce safe

Keeping our workforce safe is of paramount importance to us and a key part of our DNA. The RoSPA awards are among the most prestigious in the sphere of health and safety so we were extremely proud to have been awarded our 6th successive RoSPA Gold Award and to achieve the 'Gold Medal Status' (which is only awarded after five consecutive Gold Awards). We are currently the only network to hold this achievement.

We have also won the RoSPA Oil & Gas Sector award in 2019 for industry-leading health and safety performance.

Our commitment to keeping our workforce safe is further evidenced by achieving the new Occupational Health and Safety Standard, OHSAS 18001 in 2018; again, we are the first GDN to achieve this. In addition we have not received any formal enforcements from the safety or environmental regulators.

ROSPA Gold Award

Awarded our 6th successive RoSPA gold award.

45 minutes
On average, we attend gas emergencies within 45 minutes.

Asset resilience

We operate a resilient network

As reliability is so important to our customers, we need to ensure that we operate a resilient network. By sharpening our focus on asset health using cutting-edge risk based asset management systems and optimisation tools and high-quality data we are able not only to monitor the health and risk of our assets more accurately, but can also predict their future condition.

We use our prescriptive and predictive analysis and extensive cost benefit analysis (CBA) to make sure that our investment decisions are the most effective and efficient. These state of the art tools enable us to improve the resilience of our network through opportunities to refurbish rather than replace assets. For example, we have not needed to replace any LTS pipelines in GD1, delivering long-term value for our customers.

Workforce resilience

We invest in people

We operate across one-sixth of the UK, covering an area that stretches from Wrexham to Redruth. Our strong performance in GD1 is only made possible by the people who work for us; they are our greatest asset and we have invested significantly in them. We are proactive in workforce planning and our objective is to develop and maintain a skilled, confident and resilient organisation.

A key response to this is that by the end of 2019, we will have employed almost 200 apprentices since 2006. We are also proud to have achieved Investors in People (IIP) – Silver accreditation on our first attempt, which is further driving our focus on people and development.

INVESTORS IN PEOPLE | Silver

200
apprentices employed since 2006.

4. Delivering an environmentally sustainable network

Protecting the environment

We reduce our impact on the environment

As a major infrastructure provider, we have an important role to play in minimising our environmental impact, and we fulfil this role every single day. The majority of our carbon emissions are from our pipes, and we have lowered our carbon emissions by 18% since 2013, largely through the mains replacement programme and by actively managing gas pressures on our network.

We are committed to limiting the impact of our activities on the environment. To replace gas mains, we do have to dig up roads. However we have reduced our spoil disposals by 16,700 tonnes, which is a 38% reduction since 2013/14.

Our commitment extends across our business and we are delighted to have maintained our ISO14001 certification. This means that we meet the international standards for an environmental management system – one that focuses on the continual improvement of our environmental performance and impact.

ISO 14001 CERTIFIED

Reduced waste and landfill by 79%.

Sustainable future

While focusing on delivering in GD1, we are simultaneously looking towards 2050, making sure that we lay solid foundations for the future. We are taking a leading role in collaborative innovation projects to decarbonise heat, power and transport across our homes and businesses.

We have a clear energy vision for the future

As a leader in our field, we are making significant contributions to the UK energy decarbonisation debate, from a position of knowledge, trust and evidence. We are committed to delivering a whole systems approach – making use of the existing gas and electricity networks to provide energy that is reliable, affordable and secure; modelled by our unique Energy Pathfinder model.

Our vision is to see hydrogen in some cities and industries in our region and an increase in other green gases elsewhere, with hybrid heating in homes, alongside renewable electricity. In support of this, we have delivered ground-breaking innovation with smart hybrid heating installations in 75 homes in Bridgend, South Wales, delivering lower cost, lower carbon and more secure energy to those most in need.

We deliver green gas

Greening the gas network is a key part of our vision for the future. We have connected 19 biomethane sites delivering green gas into our network and have a further seven accepted enquiries. In total, the 26 sites would provide heat to 175,000 homes, or around 1 million hybrids.

We expect this to continue to rise, especially given the Chancellor's Spring statement which indicated that the Government will launch a consultation in 2019 on increasing the proportion of green gas into the grid.

We are proactive in the area of green gas, working with other GDNs to develop safety standards, simplifying the connections process and taking the lead with the HSE for changes to gas quality arrangements. Following feedback from stakeholders, we have introduced a 'self-lay' process for those wanting to inject gas at the higher pressure tiers.

We are enabling renewable electricity

The use of our network is constantly changing. We currently have 37 power stations connected directly to our network, and these are typically generating electricity when renewables are not available using the gas infrastructure as a battery when required, powering the equivalent of three million homes. The development of innovative network exit agreements has supported the flexibility these generators require. We have also led the industry process to change the commercial arrangements enabling GDNs to take more flexibility from the NTS. This in turn allowed us to offer more flexibility to these power stations.

We have a further 23 accepted enquiries for power stations to connect to our network. When analysing the electricity capacity market, we expect a further 28 power generators to connect in due course. In total, this would power a further one million homes.[2]

2 Based on published data from Severn Power – 1.5 million homes powered from 850MW of generation.

We are supporting the Clean Air Strategy

The Government's focus on Clean Air is resulting in alternative fuels for transport. We have connected three Compressed Methane Gas (CMG) fleets powered by gas which are improving air quality; two bus fleets in Bristol and Plymouth and a CMG truck fleet in Swindon. We expect these types of connections to our network to continue to rise throughout the rest of GD1 and beyond.

175,000
homes heated by green gas by the end of GD1.

Chapter 4. Track record (continued)

5. Delivering value for money

This section explains our work to ensure that we deliver value for money for customers, including the charges that are built into their gas bill. It also covers the financial aspects of our track record in GD1, incorporating our incentives performance, expenditure against allowances, the returns we earned and the distributions we make to our investors. All of the achievements described so far in this chapter have been delivered cost efficiently, delivering more for less and keeping bills as low as possible.

Innovation

Innovation is part of our DNA. It has helped us deliver benefits that go far beyond financial benefits to encompass safety, customer experience, value and reliability.

We continually innovate:

- The Network Innovation Allowance (NIA) plays an important role in enabling collaboration, supporting small and medium enterprises (SMEs) and delivering value for consumers.
- We have invested in more than 250 business improvement and innovation projects since 2013, representing a total investment of £19.8m. A current total of 78 projects have been implemented and are now considered business as usual status.

£9.7m
saved through innovation.

- Our implementation rates are 24% compared with a UK industry average of 17%.
- We have collaborated with other networks on 68% of our projects, sharing project costs and benefits. This compares to collaboration rates within other GDNs ranging from 48% down to 35%.
- We have delivered financial benefits (saved or avoided costs) of £9.7m.

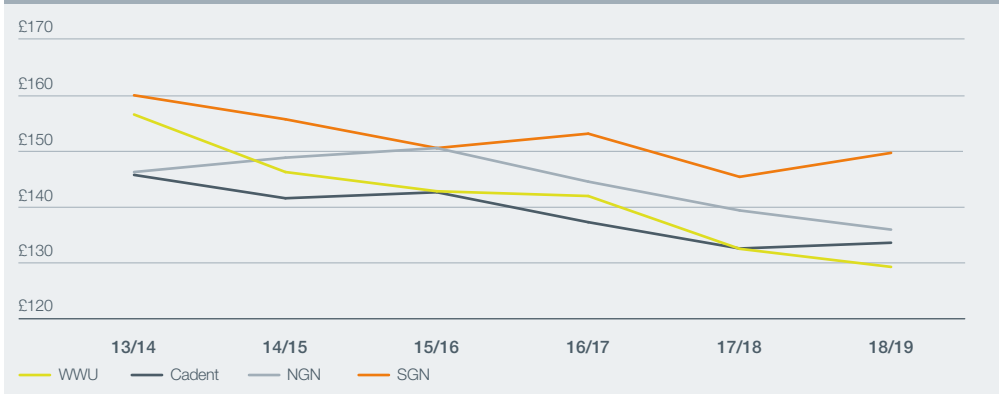
24%
Implementation rates compared with a UK industry average of 17%.

Innovation projects and benefit value since 2013

Innovation description	No. of projects	Benefit value
New technique	28	£5.2m
New process	4	£2.8m
New product	37	£1.2m
Digital solution	9	£0.5m
Total	**78**	**£9.7m**

These GD1 cost savings and avoided costs will continue throughout GD2.

Average domestic bill by GDN 2018/19 prices



Customer bills

We keep our portion of the customer bill as low as possible:

- Our charges have fallen steadily and are now £121 per year on average, compared with £154 in 2013/14. Shareholders have been subsidising this by partly funding debt costs, which equates to £9 per customer. This is currently unfunded by the GD1 package.
- At around 35p per household per day, our customers tell us this is good value for money.
- Our bills have consistently been one of the lowest of all of the GDNs.

35p p/day
One of the lowest charges of all GDNs.

Chapter 4. Track record (continued)

Sharing outperformance

We invest wisely:

- Our total expenditure by the end of GD1 will be over £2.5bn.
- We are forecasting to deliver our eight-year outputs at a saving of 19% of our controllable allowance – outperforming by £421m.

A high-level graph of cost movements over the eight years of GD1 is shown in the figure below, including a forecast for the final three years.

We leverage value from competition – saving £187m:

- For competitiveness, we test and tender 90% of our controllable external spend, saving £41m.
- We have won third-party metering and asset maintenance contracts. This reduces the full cost of the First Call Operatives who operate the emergency service to customers, saving £26m.
- We have significantly restructured our mains replacement contract, which is being delivered at a lower cost, saving £120m.

We deliver efficiently – saving £119m:

- We have optimised our colleague working patterns by investing in 'working time solutions' software, saving £27m.
- We continuously focus on measuring and improving productivity, saving £11m.
- We have run voluntary severance schemes and reduced our ongoing overtime bill, also introducing revised terms and conditions for new employees, saving £40m.
- We have invested in innovation and other company initiatives to reduce our costs, mitigate cost increases and improve our service levels, saving £18m (this includes the £9.7m mentioned previously in relation to innovation projects).
- We have invested in other areas which have delivered a number of efficiencies, including updating our processes and systems to ensure efficient support costs to our front-line services, saving £23m.

We deliver effectively – saving £115m:

- We adopt a totex approach which enables us to make the right decisions, saving £115m. Our leading asset management strategy allows us to minimise capital expenditure wherever possible. By refurbishing assets to increase their health, we are able to avoid costly full replacement.
- Stakeholder engagement and partnerships help avoid costs, such as unnecessary street works.
- Daily performance information at team level, through our Business Intelligence tool, enables a continual focus on key aspects of our business.

We share our outperformance with customers:

- We share 37p of every £1 saved.
- £72m will be returned to shippers in GD1 who should then pass this on to customers.
- A further £81m of our outperformance will be returned in future years; resulting from savings in capex and repex which are funded over 45 years.

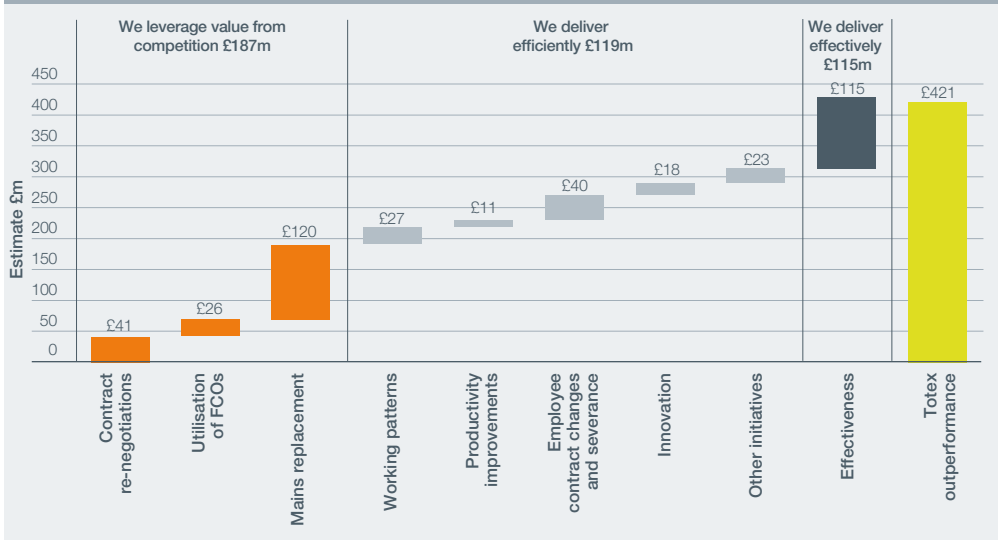
Impact on GD2 costs:

- We have no delayed costs or deferral of work going into GD2.
- Our GD2 costs base benefits from the outperformance we have achieved in GD1, because we will continue to deliver at these unit costs where possible, going forward.

GD1 expenditure and outperformance

2017/18 prices (eight-year totals) £m	GD1 allowances	GD1 forecast	Outperformance
Controllable opex	£875.9	£736.4	£139.5
Repex	£828.9	£639.9	£189.0
Capex	£513.8	£421.2	£92.6
Totex	£2,218.6	£1,797.5	£421.1

Totex forecast outperformance GD1 2013-21 (2018/19 prices)



Chapter 4. Track record (continued)

Revenue, returns and profit

Revenue:

- Despite all of these achievements in GD1, our Shareholders will absorb around £220m of a shortfall in allowances for efficiently incurred debt costs. This is unsustainable.
- We have consistently maintained strong ratings since 2010, with both S&P and Fitch, which we believe is the best track record in the sector.
- We have experienced significant variation in charges from the NTS which are misaligned to cost allowances; varying from around £20m to above £40m per year during GD1. This cash flow position is unsustainable.

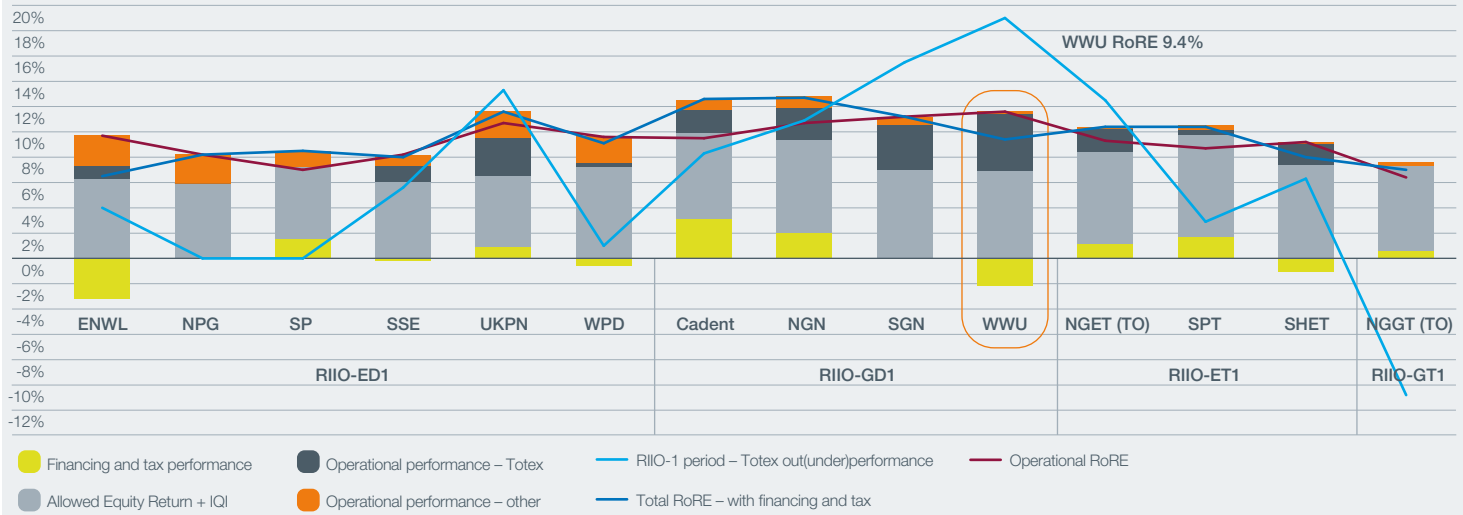
RoRE and distributions:

- Despite being a top performing GDN, as measured by Ofgem, our Shareholders are receiving the lowest returns on equity (RoRE) of all of the GDNs at 9.4% (as reported in Ofgem's 2017/18 annual report).
- We have lowered our gearing, with support from Shareholders who have received lower distributions in GD1 of a level significantly below the allowed equity real rate of 6.7%; with cash returns below 4%.

4%

average shareholder returns received against a 6.7% allowance.

Company RoRE based on notional gearing – RIIO-1 period



Source: Ofgem 2017/18 annual report

Distributions expressed as a return on notional equity

	2013/14 Actual	2014/15 Actual	2015/16 Actual	2016/17 Actual	2017/18 Actual	2018/19 Actual	2019/20 Forecast	2020/21 Projected
Distributions £m	50.0	50.0	51.0	51.0	51.0	34.0	40.0	40.0
In year real rate	4.47%	5.33%	6.24%	4.88%	3.01%	1.34%	2.31%	1.44%
Allowed real rate	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%	6.70%

Chapter 4. Track record (continued)

6. Performance against GD1 outputs and incentives

In GD1, we committed to delivering a number of primary outputs. We are proud to have delivered all of these for our customers. We have summarised our performance below – splitting the outputs into those that had annual targets and those that we had to achieve over the eight-year period.

Incentive performance

Incentives are an important part of RIIO and these help us deliver our commitments to our customers. We work hard to earn these incentives, and performance is detailed later in this chapter.

Performance against our annual outputs

GD1 primary outputs with annual targets

Primary output	Deliverable	Units	GD1 target	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Connections	Guaranteed standards of performance (GSoPs)	–	✓	✓	✓	✓	✓	✓	✓
Environment	Shrinkage	GWh	417	417.4	394.8	381.1	378.5	371.5	351.5
Safety – emergency response	Controlled gas escapes	% attended <1hr	97%	99.5	99.6	99.6	99.4	98.6	99.8
	Uncontrolled gas escapes	% attended <1hr	97%	98.3	98.5	98.6	98.5	98.0	98.9
Safety – management of repairs	GS(M)R 12hr escape repair requirement	–	✓	✓	✓	✓	✓	✓	✓
	Mgmt of repairs (repair risk)	–	✓	✓	✓	✓	✓	✓	✓
Safety (major accident hazard prevention)	GS(M)R safety case acceptance by HSE	–	✓	✓	✓	✓	✓	✓	✓
	COMAH safety report reviewed by HSE	–	✓	✓	✓	✓	✓	✓	✓
Customer service	Planned interruptions	Score/10	8.5	8.59	8.68	8.72	8.62	8.74	8.80
	Emergency response/repair	Score/10	9.0	9.14	9.44	9.55	9.55	9.53	9.56
	Connections	Score/10	8.4	8.34	9.01	8.88	9.17	9.19	9.18
	Overall satisfaction	Score/10		8.69	9.04	9.05	9.11	9.15	9.18
	Complaints metric	Score	<11.57	7.39	6.93	4.43	2.83	2.80	2.51

Chapter 4. Track record (continued)

Forecast performance of eight-year outputs

GD1 primary outputs with eight-year targets

Primary output	Deliverable	Units	GD1 target	2018/19	GD1 to-date	Forecast to end GD1
Connections	Introduce distributed gas entry standards	–	✓	✓	✓	✓
Social obligations	Fuel poor connections	no.	12,590	1,083	10,150	12,590
	CO awareness	–	✓	✓	✓	✓
Environment	Shrinkage (leakage)	GWh	357.2	332.1	332.1	321.0
	Biomethane connections	Total connected capacity kWh	✓	✓	✓	✓
Reliability – loss of supply	Duration – planned supply interruptions	Million minutes	92	6	59	74
	Duration – unplanned supply interruptions	Million minutes	45	3	25	35
	Planned supply interruptions	no.	451,235	34,835	269,647	345,022
	Unplanned supply interruptions	no.	90,169	8,775	53,045	71,828
Reliability – network capacity	Achieve 1 in 20 obligation	Capacity booked	✓	✓	✓	✓
Reliability	Maintain operational performance	–	✓	✓	✓	✓
Safety – mains replacement	Iron mains risk reduction (mains risk prioritisation system-based)	Risk score	97,675	8,531	97,675	104,500
	Sub-deducts networks off-risk	–	✓	✓	✓	✓

GD1 incentive performance

	2013/14 – 2018/19		
Incentive	Amount available	Amount earned	Commentary
Broad measure of customer satisfaction	+/-£13.33m	£12.91m	We exceeded the Ofgem targets in most years, so earned close to the maximum incentive available.
Stakeholder engagement	£13.06m	£4.95m	Our performance ratings have varied – we are now implementing an improvement programme based on lessons learned.
National Transmission System (NTS) exit capacity	Volume target	£3.82m	We have faced dramatically changing costs at some offtakes.
Environmental emissions	Volume target	£12.59m	We have been innovative in managing leakage, reducing our impacts on the environment.
Shrinkage	Volume target	£2.92m	Year on year movement in allowed vs actual shrinkage volumes not as high as expected.
Innovation	£11.76m	£9.74m	This money is passed directly to third party innovators.
Discretionary reward scheme (DRS)	£4m*	£1.74m	This incentive is available every three years. The independent panels have recognised our leadership on future of energy, fuel poverty and carbon monoxide awareness initiatives, resulting in the discretionary awards.

* The £4m DRS is shared across all GDNs.

Conclusion

As we have outlined throughout this chapter we have been listening and responding to our customers; delivering world class service and industry leading safety performance alongside increasing our support for those living in vulnerable situations. We are clearly operating in an ever-changing sector and we will continue to lead locally and nationally to support decarbonisation.

Our investment in our network and in our people in GD1 provides a strong foundation from which to move forward. We will be unable to maintain this performance if we cannot recover efficiently incurred financing costs.

We look forward to working alongside our customers and stakeholders to make sure that we are delivering against our promises and commitments as we respond to their changing needs.

B

Meeting the needs of consumers and network users

Our business plan is built to deliver the services our customers and stakeholders have told us they value.

Customer service is key to our business as our work takes us into customers' homes, businesses and local communities. Our services are aligned to Ofgem's vulnerable customer strategy and we demonstrate here how we meet and go beyond our licence obligations.

In this section:

5. Giving customers and stakeholders a stronger voice 35
Our engagement journey in GD1, our GD2 strategy, and the role of the CEG.

6. Customer service 52
Our high-level strategy for customer service.

7. Social obligations 62
Meeting and exceeding expectations for those living in vulnerable situations.

Chapter 5. Giving customers and stakeholders a stronger voice

1. Highlights of our plan

- Robust analysis of customer and stakeholder evidence has shaped our GD2 business plan commitments, including acceptability and willingness to pay consumer studies.
- We have engaged more inclusively through finer customer and stakeholder segmentation than ever before. Enhanced engagement has become a valued tool, with the evolution of our Critical Friends Panel and Customer Engagement Group, as well as planning a new Citizens' Panel.
- Quantitative analysis has revealed different customer personas in our region, providing information on what drives satisfaction levels. With broader customer segmentation and understanding of customer priorities and interests, we can deliver services with a more targeted approach.
- Our enhanced understanding of the needs of customers living in vulnerable situations will enable us to both communicate and deliver more tailored services.
- Engaging with a very broad range of stakeholders and customers has highlighted strong support for our sustainability ambitions and environmental protection plans.
- We have embraced a broader range of external intelligence so our engagement is efficient and informed, working with experts to effectively analyse and triangulate evidence.
- We have worked collaboratively with the other GDNs to reach national and strategic stakeholders, an approach that we will build on to include other utilities.

Customer – People who are users of our network, who pay for a service from us or who are impacted by our works – both directly and indirectly. We include businesses, and domestic and industrial consumers in this group.

Stakeholders – People who affect, or are affected by, our business and the way we operate.

2. Introduction

In advance of GD2, we have continued to engage with customers and stakeholders, following a revised strategic approach. We have sought advice and considered best practice approaches from independent experts to develop our enhanced engagement programme.

Following a challenge by the CEG, we have worked alongside experts to collect, evaluate and triangulate all of our stakeholder feedback to further inform our plan. We span diverse communities, and are committed to delivering a 'centrally facilitated, locally delivered' approach to engagement via our operational colleagues who live and work in the communities they serve. Connecting with many groups in society enhances our understanding of their wants and needs, and enables us to shape our services to enable us to better support them.

3. Our GD1 engagement journey

In GD1, our Stakeholder Engagement Incentive (SEI) submission reporting has ranked us inconsistently.

We scored the highest of all the GDNs in 2014/15, however, we have not been able to maintain this level of performance. Throughout GD1, we have continued to refine the way we identify our stakeholders and engagement topics, laying the foundations of effective stakeholder engagement via an 'inside out' approach. We have created a culture of engagement internally, committing to robust resourcing of our central engagement management and insight team through GD2.

Our journey in GD1 has seen us evolve from a business that led in high-quality customer service to one recognised as a responsible business.

This was, in part, driven by the co-creation of our company ambition, priorities and values with colleagues.

Our evolution is continuing towards becoming a sustainable business into GD2 and beyond, and our engagement programmes are focused on authenticity. This will make sure that customers and other stakeholders trust us to deliver sustainable, reliable and value for money services in their best interests.

Click **Appendix 5A** Our Journey and Lessons Learned Log for our GD1 engagement review and our plans for GD2.

Click **Chapter 19: Workforce resilience** for more information on colleague engagement. 181

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

The engagement strategy underpinning our plan

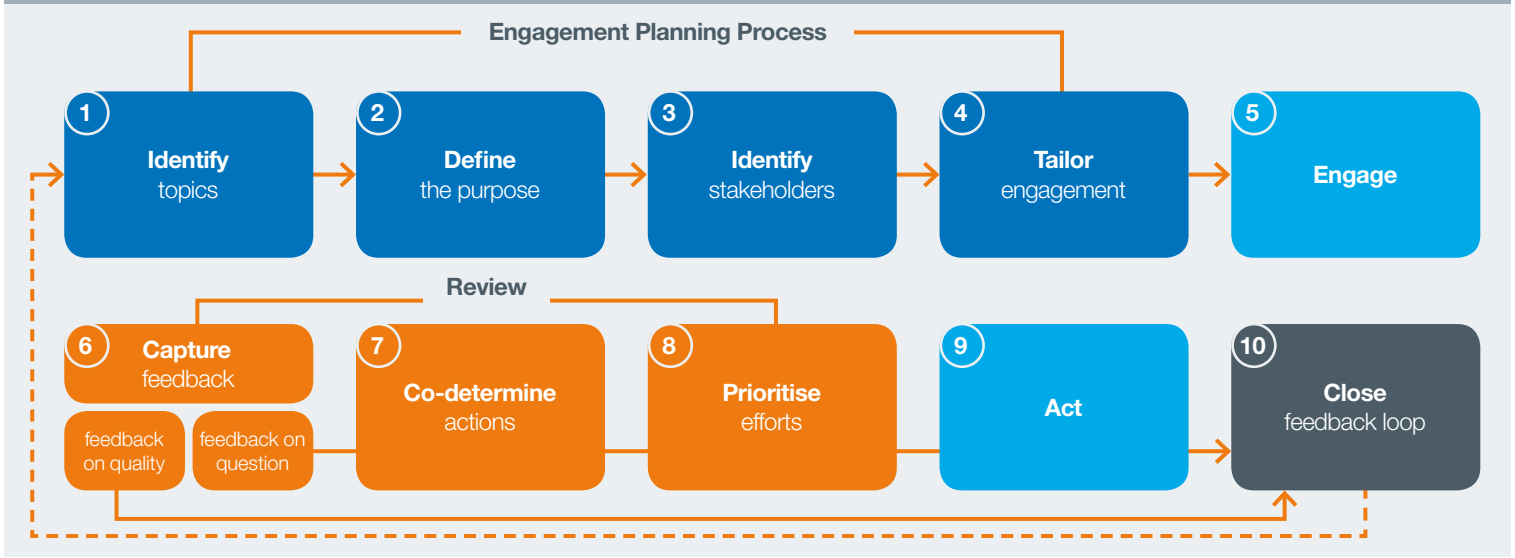
Our Stakeholder Engagement Strategy has helped us gather informed, actionable and specific feedback at all stages of our engagement plan. This 10-step approach is based on a virtual cycle of engagement and was developed as part of a three-month 'root and branch' review. We worked alongside Sia Partners, engagement experts with significant experience assisting networks in delivering positive outcomes for customers.

Our strategy is built to:

- identify engagement topics from external and internal insights;
- formulate a clear question for stakeholders to answer at each event;
- select stakeholders with the most appropriate knowledge to provide informed, actionable feedback;
- choose the best method of engagement based on stakeholder group characteristics;
- inform stakeholders on our proposals and allow them to challenge them;
- capture feedback and triangulate stakeholders' views to influence and further shape our proposals.

Our engagement strategy is underpinned by robust governance. Our Executive team plays a key role at all stages, providing strategic direction, taking part in engagement activities and making decisions in response to stakeholder feedback. We have an Engagement Planning Guide to make sure that colleagues understand the benefits of engagement and they know how to respond to any feedback they receive.

Our revised engagement planning process



Identifying stakeholders, engagement topics and channels

We've evolved our customer and stakeholder segmentation in GD1, holding manager workshops to determine stakeholder groups and priorities for engagement. Further work to identify potential organisations and individuals to engage with has continued, as different teams develop their engagement plans.

Our GD2 preparation has broadened our segmentation, with 72 segments now actively tracked and managed.

To target effective business as usual engagement, we have a new stakeholder segmentation tool, developed with our expert partners. This enables us to choose the most suitable stakeholders to engage with on a specific topic, in relation to their expertise and interest. Our revised stakeholder segmentation and planning looks at engagement priorities, risks and assumptions.

Click **Appendix 5B** for a detailed stakeholder segmentation map.

Click **Appendix 5C** for our stakeholder engagement strategy.

Pre-GD2 engagement plan

We have planned our engagement based on stakeholders' interests and the services we deliver that may affect them. Subsequently, we have also engaged on our business plan commitments and outputs. Our engagement plan is inclusive and accessible, recognising regional differences and appropriately targeted on both subject matter and channel.

Click **Appendix 5D** for our pre-GD2 engagement plan.

It details engagement topic, stakeholder group, engagement channel and intended outcomes. This then links to the actions taken as a result of our engagement.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

Customers helped us to co-determine our quantitative research survey questions in demographically representative qualitative focus groups. This helped to make sure that we were asking customers questions that were relevant and easy to understand. Our workshops are independently facilitated to encourage openness and we consult beforehand to find out particular topics of interest. When engaging on complex topics, we try to take account of the knowledge levels of customers and stakeholders. We also make use of educated customer panels and include educational sessions in regional community workshops.

We've prioritised engagement with vulnerable customers using elements of ethnographic engagement in their own homes. This helps to make sure they are comfortable and able to answer our questions, with the aid of professional researchers experienced in this area. Our engagement programme is planned to take account of regional differences, including separate Welsh Language legislative requirements. Our communications are dual language when we are engaging in predominantly Welsh-speaking areas and in mass communications across Wales.

Click **Appendix 3A** for a full explanation of how engagement has informed our GD2 commitments and outputs.

This records the engagement journey, from identification of customer and stakeholder priorities, through to resolution of conflicting views, final acceptability testing and willingness to pay studies.

Click **Appendix 5E** for our triangulation feedback summary for our triangulation feedback summary.

Click **Appendix 5F** for engagement analysis and triangulation by topic in associated synthesis reports for engagement analysis and triangulation by topic in associated synthesis reports.

Partnerships

Collaboration and the creation of key strategic partnerships across our network have been incredibly valuable to enhance the quality and diversity of the feedback we receive. Partners have helped us to understand more about consumer vulnerability and the root causes of vulnerability in specific communities, so we can better provide targeted support. Our partners and other community organisations also help us access hard-to-reach customers.

We plan hyper-local engagement via programmes with small, niche organisations that give us access to people we would not normally be able to reach.

These organisations included Women Connect First Cardiff (BAME women speaking circa 16 different languages) and The Centre for African Entrepreneurship that enable us to engage with respected senior community members.

We try to make it easier for customers to engage with us and tell us what they think by:

- using technologies such as text messaging, social media and QR codes at gas pipe replacement sites, and apps such as Sign Video (to assist communication between deaf BSL users and our hearing FCOs);
- regularly testing our communication channels with customers, to ensure they remain fit for purpose. For example, we launched our revitalised website in July 2015, accredited by the Shaw Trust for accessibility;
- embracing the principles of plain English, making sure all our standard text and external correspondence is clear and concise.

To make sure we don't become complacent in our own opinion of our relationship with stakeholders, we also carry out 'relationship scans' of our stakeholders, assessing our relationships and identifying which ones we need to strengthen.

Measuring and embedding our engagement

Using insight

Sentiment analysis from third-party company, Alva, and Insight, our own real-time Business Intelligence tool allows us to measure our performance. We also interrogate other customer data for recurring issues and trends in customer/consumer complaints to help drive issue engagement.

Engagement Champions

Over GD1, we have supported colleagues to better understand the significance of effective stakeholder engagement and appreciate the benefits it has on all elements of our business. Engagement Champions help us embed new stakeholder processes and support their colleagues with Day After Reporting to capture all relevant outputs from external meetings and events.

Our champions are important in terms of engagement information management across the business. They manage information from Day After Reports so that it is linked into our Engagement Tracker, and then actions we need to take following engagement are allocated to the correct colleague and actioned appropriately. This supports our 'centrally facilitated, locally delivered' engagement approach.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

We conduct Literature Reviews to look for new and emerging stakeholder groups and identify cultural trends, and have forged successful relationships with Government departments such as BEIS, IGEM, universities and the voluntary sector. This is a cost-effective way to gain data, by making the most of research commissioned by others.

Event evaluation and feedback

To measure the effectiveness of our engagement methods and channels, we seek feedback through event evaluation forms, reviewing the results following each formal activity. This allows us to make sure it has been successful and to make adjustments in our engagement planning and activities as needed. Our events regularly have stakeholder satisfaction ratings of 90%+.

Providing feedback about what we have done as a result of listening to feedback is critical, and we do this in a range of ways. For example, when we engage with our major gas users, we give clear feedback about how they have influenced our planning, processes or the development of new and more efficient technologies.

By contrast, when we engage with customers on a wide scale basis, feedback needs to be bite sized and easy to understand – often using social media. An overview of our activity is given through our annual stakeholder report, which we promote to key community representatives and through social and traditional media.

We send reports, written by our independent facilitators, to our Critical Friends Panel (CFP) members and Regional Community Workshop attendees, post events – and report on our actions at follow-up meetings.

Stakeholder engagement making a difference to what we do and how we do it

We can demonstrate changes to the way we operate which came from listening to customers and stakeholders. For example, we have:

- adopted a more finely targeted approach to carbon monoxide awareness to reach those most in need;
- used our innovation processes and frameworks to seek support from others to resolve areas of concern for customers;
- significantly increased the number of customers we engage with directly;
- used more sophisticated statistical analysis to understand the root causes of customer satisfaction using CHAID analysis (a method used in this case to identify the drivers of satisfaction;
- deployed local Customer Support Officers (CSOs) to provide information and support to customers in their homes and communities;
- changed our reinstatement contracts to provide a faster service, as this was a recurring area of customer concern;
- changed some of the tooling and cleaning equipment we provide to operational teams;
- stepped up gas pipe replacement communications and CSO visits for small businesses in response to feedback from the Federation of Small Businesses on how disruptive our roadworks can be for members.

Responding to feedback

An example showing how our activities have been influenced by stakeholder engagement is our approach to the provision of carbon monoxide (CO) alarms.

Between 2013 and 2016, we attended the summer shows, providing free CO alarms and awareness information to around 3,000 people (costing c.£100,000/£33.33 per contact).

In 2013, our CFP challenged us to be more targeted with our CO awareness, to include younger generations. In direct response, we initiated partnerships with the Royal Welsh College of Music & Drama, Age Cymru and Devon and Somerset Fire and Rescue Service.

In 2016, we reviewed our CO Strategy following feedback that there may be a more targeted and cost-efficient way to raise CO awareness.

This new strategy was presented to our CFP who wholeheartedly supported our approach and encouraged more partnership working and education for school children.

Consequently, we reviewed all our partnerships and began working with Care and Repair Cymru and six Fire and Rescue Services to provide free CO alarms to customers in vulnerable situations.

In 2017 we introduced our schools programme, which saw our newly appointed colleague Gas Safety Ambassadors educating primary school children about the dangers of CO. In 2018, we developed a 'super priority group' to further improve our targeting. This change meant that we were committing to 80% of our CO alarms being provided to those living in the most vulnerable situations. This approach was tested in our training where 100% of partners agreed this was the right thing to do.

In 2019, we educated 3,528 pupils through our Gas Safety Ambassadors programme and doubled the number of ambassadors. In December 2019, we anticipate reaching a further 300 pupils – totalling 3,828 pupils for the year.

Click **Chapter 7: Social obligations** for more information. 62

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

4. GD2 Enhanced engagement planning

Approach to enhanced engagement

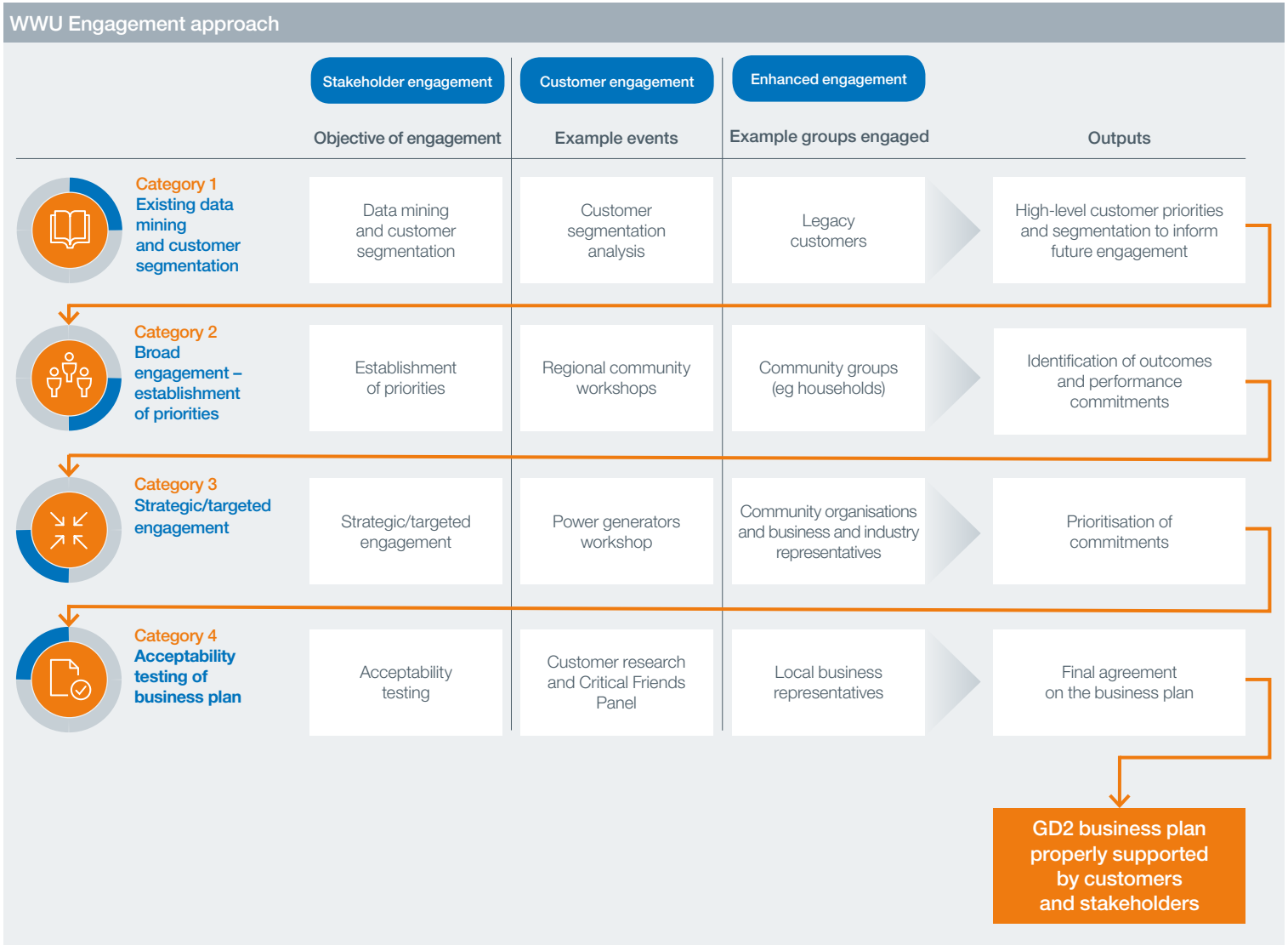
Our revised Engagement Strategy guides our enhanced engagement planning.

We established four categories of engagement activities that would help us develop each stage of the business planning process by taking into consideration the needs of our customers and stakeholders.

These categories were conceptual phases which would allow us to assess customer segments, their priorities and their views on our proposed outputs and commitments. They are also important to help us gain acceptance for our business plan as a whole.

The engagement was an iterative process, with each stage output feeding into the subsequent category.

All our engagement has been aligned to a relevant category, as per this graphic showing our engagement approach.



Chapter 5. Giving customers and stakeholders a stronger voice (continued)

Category 1
Existing data mining and customer segmentation

This category of engagement has enabled us to identify high-level customer priorities and customer segmentation that can be used to inform future engagement. We were able to complement our stakeholder segmentation and establish domestic customer segments with associated profiles, as below. Given we do not have a customer database, this engagement and resulting evidence helps us to understand who our customers are. Our consultation with 21,000 customers and stakeholders across the network, as well as the interrogation of 1.45 million pieces of annual customer data, have supported this evidence gathering.

High level customer segmentation

Further engagement and analysis enabled us to demonstrate the relative importance, perceived value and price elasticity of our business areas, and how this differs across our population, along with the identification of domestic customer personas.

Click **Appendix 5G** for further information on customer personas.

Our customer personas are attributed to four main segments, with the following characteristics:

- **Environmentally considerate:** 26% of customers tend to be older and more concerned about the environment than average, and place more emphasis on safety.
- **Apathetic and unengaged:** 29% tend to be less interested in investing in the environment, however they are focused on safety and reliability of service.
- **Live for today:** 18% of customers tend to be busy young millennials focused on social issues. They are the least engaged group, have stronger opinions and are only willing to pay for the things that affect them.
- **Environmentally engaged:** 28% of customers tend to be younger females, and are concerned about environmental issues.

We carried out further segmentation work that included regional differences and a range of other differentiations in relation to our business activities. Through this, we could make sure that we carried out appropriate engagement, so that feedback and subsequent analysis and triangulation would be able to shape our business planning and hone our GD2 customer commitments. This enabled us to make sure that we are proposing solutions that are appropriate for the full range of customer needs.

Click **Appendix 5B** for further information on our customer and stakeholder segmentation.

Customer personas and more detailed segmentation helped us to understand the most appropriate topics and communication channels we should use to engage with specific types. This is important, as detailed CHAID analysis of our customer research has shown us that knowing more about WWU drives up customer satisfaction of our services. So, it is important for us to raise awareness of who we are and what we do in the most appropriate way that is relevant across regions.

For example, we know that minimising our environmental impact and decarbonisation is most important to customers in the south west of England, and we know that on a customer level this is of greatest interest to younger females.

We are currently using our customer personas and applying this intelligence to support the development of more detailed communication plans for each customer type – which will aid our delivery of great customer service and our wider GD2 business plan.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

Category 2 Broad engagement – establishment of priorities

This category is both broad in terms of the methods employed and the depth of questions asked, allowing us to understand the outcomes customers want and the performance commitments they require. This engagement included:

- discussions at summer shows with over 7,000 customers in Wales and over 2,000 in the south west of England through our 2018 'Let's Connect' Consultation;
- regional workshops with 141 regional community representatives (May 2018 and May 2019);
- engagement with future bill payers in qualitative focus groups;
- a comparison of consumer priorities with industry and topic experts via a bespoke survey and one-to-one meetings;
- workshops with community organisation representatives (Critical Friends Panel);
- engagement with local government departments and elected members to understand their communities' priorities.

Click **Appendix 5D** to see how the identified priorities helped us develop our GD2 business plan commitments.

Category 3 Strategic/targeted engagement

For this category, we used the outcomes of category 2 engagement to guide targeted engagement with specific stakeholder groups, including engagement on the proposed commitments.

We engaged with other networks, utilities and the wider energy industry, government departments, energy groups and academics.

We have long supported local decarbonisation efforts and are involved in Local Area Energy Plans (LAEPs). We also engage with local stakeholders including local authorities and renewable and low carbon energy advocates. These engagements have heavily informed our own net zero ready vision.

We directly support others and share findings of our research, including our Freedom project and Pathfinder, to help local communities develop their LAEPs.

Click **Chapter 13 Our net zero ready vision 2035** for further information. 110

Click **Appendix 13E** for outline proposals to use these plans for further engagement and investment planning from GD2.

Regular BEIS Smart Metering Operations Group meetings, SPAA Intervention Solutions Sub Group catch ups and supplier bilateral meetings give us opportunities to engage with others (ie suppliers, GDNs, DNOs, Citizens Advice, Energy UK, ENA) to discuss how we can reduce faulty installations resulting from smart meter installations. Building on category 1 and 2 engagement, we undertook a targeted 'deep dive' on priority topics such as sustainability, costs and innovation. Impact Research facilitated a series of qualitative workshops with an educated Customer Panel.

We also held one-to-one interviews with 100 customers in vulnerable situations in their homes, as well as interviewing carers and support agency colleagues. This research was vital in building our Vulnerability Strategy and CVP, so we used experts in this field, Mindset, to better understand consumer vulnerability in relation to the use of our services and impact of our work. Through this engagement, we have identified the growing incidence of emotional vulnerability, which appears to be widespread and has been a consideration in the development of our customer GD2 commitments – and will play a key role in their delivery.

Category 4 Acceptability testing of the business plan

Acceptability testing has been phased in two parts, with the second phase including Willingness to Pay for domestic and SME customers. These results are referenced through this plan submission, including the results of face to face interviews with vulnerable customers to capture their understanding of and acceptability for our plan commitments. Engagement evidence has informed our 25 GD2 business plan commitments.

Click the **Executive summary** for all of our 25 commitments. 4

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

5. Our engagement findings

The following section provides the high-level findings that emerged from our engagement by topic.

Meeting the needs of consumers and network users

Increased awareness of WWU

Although our customers have a low awareness of WWU – they want to know more.

Increased understanding of our role was demonstrated to drive greater perceptions of satisfaction for our services. When explained, customers are impressed by what and how well we deliver – especially on safety and reliability. We are providing services they believed to be delivered by their suppliers and this drives a more positive perception of the value for money we provide.

Informed, expert stakeholders want to see greater external promotion of gas network activity. In response to feedback, underpinned by our Stakeholder Engagement Strategy, we will increase our engagement in GD2 to enable us to connect with more wide-ranging groups within our communities. We discussed and rejected the possibility of a customer brand awareness campaign. The CEG challenged the idea of a campaign, due to costs and the 'monopoly' nature of our organisation.

Customers living in vulnerable situations

We were not anticipating the breadth of multiple vulnerabilities that some individuals have to contend with. It was therefore not surprising that the services we provide for those living in vulnerable situations are placed ahead of general customer service. There was an alarming lack of understanding of the existence of Priority Services Registers (PSR). Stakeholders considered raising awareness of the PSR, and working towards a common register, a priority. This was also raised as a challenge by the CEG.

Strategic stakeholders said they wanted to see GDNs play a central role in providing support for those living in vulnerable situations as our energy system becomes increasingly complex. Those up to the age of 55, living in Wales and considered fuel poor were more likely to highly rate support of vulnerable customers.

Further collaboration with partners will help to further increase our understanding of the spectrum of vulnerability. Our promise to increase PSR sign-up by 200% and to campaign for a single utility-wide PSR will clearly address this.

Our better understanding of the many ways in which we can negatively impact those living in vulnerable situations before, during and after our works will serve to ensure that we conduct ourselves in a sensitive manner where for example customers are suffering from anxiety or issues relating to autism.

Customer service

As a result of our excellent track record in this area, customer service was deemed a low priority but we are expected to at least maintain our current performance, focusing on complaints and compensation. Overall satisfaction for connections is 89% but according to CHAID analysis, could increase a further 10% if communication, quality of work and time taken were improved upon.

In response to the above feedback, we will amend our customer survey to allow feedback by phone and an online survey. Addressing root causes of complaints – something the CEG challenged us on – will help us address these before they become an issue.

We will improve communications for our connections customers, with the relaunch of our Connections online self-service portal, the introduction of a 'track my engineer' app and identifying a named contact at each local authority.

Our acceptability and willingness to pay research has shown that in this area our commitments focusing around our business activities were rated higher by SMEs, with domestic customers supporting vulnerable customer and gas theft initiatives.

200%

We promise to increase PSR sign-ups by 200% and campaign for a single utility-wide PSR.

Delivering value for money

Innovation

Customers consider innovation to be a business as usual activity, providing an opportunity to improve services at a reduced cost. Informed stakeholders felt that time pressures and cost restrictions should not be allowed to stifle innovation, and collaboration between networks could be incentivised around future energy solutions.

We have ambitious innovation plans in response to this feedback, including an investment level of £13.3m. We will use the incentivised funding to deliver large and higher risk projects that bring societal benefits. Business as usual innovation will continue to deliver lower risk projects that facilitate an improved customer experience and reduced costs. Collaboration will allow us to identify solutions to common challenges.

We need to ensure that whilst collaboration is beneficial, it may not be compatible with competition. In our acceptability and willingness to pay research, maintenance of average bill prices was rated the second highest of the commitments – after attendance at emergency interruptions, by both domestic and SME customers.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

Delivering an environmentally sustainable network

Sustainability and the environment

Interest in our activities that would support decarbonisation and protect the environment was much more widespread than we had envisaged.

Concerns were wide-ranging and included areas such as leakage reduction to protect the environment, the reduction of our carbon footprint and our use of non-recycled plastic pipes to upgrade older, leaky metallic pipes. Our robust Environmental Action Plan (EAP) will help to drive our sustainability agenda in GD2. Our alignment with the Sustainable Development Goals (SDG) will ensure that environmental issues remain front of mind for our colleagues, customers and stakeholders.

Our vision for a net zero ready network by 2035 also demonstrates our commitment to a greener future. In our acceptability and willingness to pay research, both SME and domestic customers agree that sustainability is important. For domestic customers, moving to a zero-waste company is key, while SMEs want us to reduce our CO_2 emissions through our commitment to our replacement programme.

The future of energy

Most customers were comfortable with the concept of hydrogen, although did have some concerns around safety. Reaching our decarbonisation targets must be a priority, according to expert stakeholders and it is important that we have future-proofed assets. They also want a national conversation around the future of heat to better engage customers. Stakeholders want 'low regret' but urgent investment to provide a future-proofed system in the short term.

Significant work is taking place to ensure that when we start transporting hydrogen, we do so safely and that our assets are resilient for the future. We will be continuing to engage at national and local levels to provide leadership, evidence and modelling capability for future of heat discussions.

Maintaining a safe and resilient network

Safety

Safety is the most important priority for our customers and they want us to continue work to limit risk to our network.

In our acceptability and willingness to pay research, both SME and domestic customers ranked attending emergency gas escapes in under an hour and continuing the gas pipe replacement programme as their most important priorities. For SMEs, the top four rated commitments in terms of willingness to pay related to safety. Those aged 55 and over are more likely to rate emergency gas interruptions as important. Although some customers asked whether we could 'fast track' our mains replacement programme, we are unable to safely complete this in a shorter timescale.

Customers want us to consider improving communication and support for those on the PSR and those living in more rural communities, always aiming to minimise disruption and the number of excavations.

Safety will remain at the top of our priority agenda in GD2.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

6. Evidence triangulation

How we designed our approach

To accurately interpret disparate sources of feedback and draw the correct conclusions for this plan, we have learned from best practice and legislative guidance, and have consulted with independent experts.

We have closely scrutinised the use of both synthesis and triangulation by the water sector in PR19. Our approach was informed by those who were considered 'best-in-class', whilst also incorporating opportunities to build on their work.

We have utilised legislative guidance from the 'Magenta Book' published by HM Treasury, building key concepts directly into our approach to evidence this. This provides guidance for evaluation, setting out standards for best practice and adds an additional level of rigour, as do the Cabinet Office's standards (ie Green Book) for our quantitative analyses.

Finally, we have partnered closely with independent experts to ensure that our evidence base is credibly interpreted, providing a consistent, unbiased appraisal of the broad range of opinions that we have collected in preparation for GD2.

A three-stage approach for gaining and utilising evidence

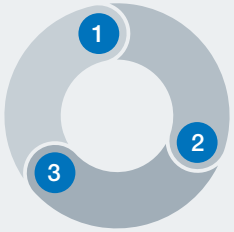
A bespoke approach established to utilise evidence

We have developed a three-stage approach for gaining and utilising evidence. This approach, shown in the diagram below, demonstrates how we worked with the research and engagement undertaken to develop our proposed business plan.

1. Engagement

- Planning and scoping of topics and stakeholders to engage.
- Execution of engagement across regions and customer and stakeholder groups.

Wales & West Utilities, mindset, Accent, IMPACT and other partners



2. Synthesis and evaluation

- Collection and management of feedback by topics in central database.
- Reporting back to WWU business owners on engagement results and findings.
- Evaluation of each source by assigning a 'weighting' of four different criteria.

Sia Partners

3. Triangulation

- Decision-making by WWU business owners on specific commitments and service levels, based on evidence collected.

Wales & West Utilities

Engagement

In gathering our evidence base for the GD2 business plan, we have tapped into a significant number and variety of sources, including:

- existing research or engagement, conducted by us or others, not directly related to GD2;
- performance data, benchmarking various years of our past performance, or comparing our performance to that of our peers;
- specific, targeted research or engagement that has been planned and executed for the sole purpose of informing our GD2 plan.

All the feedback and evidence gathered during this process was carefully recorded to maximise its usefulness for informing our proposals.

Synthesis and evaluation

Synthesis and evaluation involve all aspects of collecting, categorising and assessing the evidence received. This is the second and most important aspect of our approach.

The objective of the synthesis stage is to organise insights in a way that can be easily interrogated and used to inform our early proposals, allowing us to extract the maximum amount of value from the evidence. The collection and organisation of the evidence base was conducted by our expert partners, who extracted specific pieces of feedback from each source, positive or negative, that is associated with each commitment. Structuring evidence is the foundation on which we built a clear link between insight and action – an audit trail taking the reader from source, through feedback, to action.

The evaluation of evidence allows our output owners to understand the 'weighting' they should place on each piece of evidence, knowing how much value to place on each piece of feedback. We have based our approach to evaluating evidence on the principles laid out in HM Treasury's Magenta Book for qualitative evaluation. These include:

- methodologically sound;
- rigorously gathered;
- credibly interpreted.

The objective of the evaluation stage is to provide a consistent, absolute weighting for each piece of evidence – a clear benchmark with which to prioritise differing opinions.

The evaluation of our evidence base has been conducted by Sia Partners, who, after collecting and organising our evidence, applied the principles above to assess the insight gathered to date. This ensured a credible interpretation of the evidence and maintained consistency across the database.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

Triangulation

To draw the correct conclusions for this plan, after having collected, accurately interpreted and evaluated each piece of feedback, we used evidence triangulation.

The overarching objective of the previous steps, and triangulation more broadly, is to identify the ideal point of convergence of customer and stakeholder opinion. We aim to find the proposal that satisfies the broadest segment of those surveyed while respecting sound cost benefit analysis and engineering justification.

We have approached triangulation as an iterative process – identifying snapshots of all evidence available to output owners at critical points in the process. These snapshots depict all the evidence available to the output owners when submitting their proposals at each stage.

Overview of this approach in practice

The process to collect and evaluate our feedback has been structured at a commitment level; we identified points of view from all sources concerning each of our commitments. These have evolved throughout the business planning process, further increasing the importance of demonstrating how evidence was used in this process.

Each evidence source was examined by our independent experts to establish key metadata including:

- Date of engagement/research
- Number of stakeholders engaged
- Stakeholder/customer segments engaged
- Type of source (eg RIIO-2 focused, business as usual engagement)
- Method of engagement
- The method used for collection

Each evidence source was then read again in detail, with key quotes/passages (the 'feedback') extracted and linked to the appropriate output. These links were supported with document references included for simple cross-referencing. All the information was stored in a clearly referenced database which will remain the single source of truth for our evidence, providing a granular view of all insight gathered throughout the business planning process.

For all sources of evidence, Sia Partners assigned a score for each of the four metrics derived from the Magenta Book.

The evaluation was performed on an absolute basis to be comparable across all commitments (ie one single measure of 'Methodologically Sound' was applied across all sources of feedback on all commitments). The scale of scoring sources ranges from 0 to 3 and is applied across all four criteria. Each score is weighted equally (25% each) in order to derive a final average score for the source, which is rounded to the nearest full value.

All sources and the insight they provided on each output were summarised in tables, alongside a weighting score. These scores were used by output owners to inform decisions for the business plan.

This engagement is summarised in the triangulation appendices.

Click **Appendix 5F** for full draft synthesis reports for this submission.

We've used independent triangulation to understand our customer priorities.

Triangulation information has been reviewed to reflect engagement throughout to clearly represent how our proposals have evolved, based on the remaining events of our pre-GD2 engagement plan and the specific feedback received from the RIIO-2 Challenge Group and CEG.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

Stakeholder conflicts

Where there is conflicting feedback we have considered a series of questions to help us resolve conflicts, which include:

- Should all levels of opinion be treated with similar weighting? (no need for expert opinion).
- Is expert opinion more relevant over qual or quant customer opinion?
- Does the mass of opinion lead to actions that are cost prohibitive? (eg CO alarms for all customers).
- Would the mass of opinion lead to unacceptable disruption for society? (eg complete all repex work as quickly as possible – also cost prohibitive).
- Would taking action on mass opinion result in an unfair balance of cost split between current and future customers? (eg complete all repex work as quickly as possible).
- Would acting on mass opinion result in putting customers at an unacceptable safety risk? (eg reduce bill costs by not investing further in gas pipe replacement/maintenance programmes).

Where we have received conflicting stakeholder feedback, we have outlined the rationale for how we have come to our decision on what action to take in our output justification appendix.

Click **Appendix 3A** for our outputs justification document.

Click **Appendix 5E** for our triangulation summary report.

Click **Appendix 5H** for full details on stakeholder conflicts.

Summary of stakeholder conflicts and resolution

Deliverable	Conflict	Resolution
Consumer Vulnerability 'use it or lose it' allowance	Differing views ranging from providing CO alarms to all, to targeted distribution and some felt it was not our responsibility at all.	Our commitment is based on our SROI tool to target our efforts where we can add most value – broad awareness messaging, directly educating school children and using partners to distribute CO alarms to super priority customers.
Fuel Poor Network Extension Scheme (FPNES)	RIIO-2 CG and CEG challenged lack of ambition in FPNES numbers. Citizens Advice report flagged potential conflict with decarbonisation of heat but wider stakeholders support FPNES if gas is best option for the home.	The lack of funding for new heating systems limits our ambition but will be flexible if new funding becomes available. Ofgem require partners to demonstrate gas is the best option for a property for FPNES funding to be provided.
Enhanced GSoP payments	Differing views ranging from providing CO alarms to all, to targeted distribution and some felt it was not our responsibility at all.	Our commitment is based on our SROI tool to target our efforts where we can add most value – broad awareness messaging, directly educating school children and using partners to distribute CO alarms to super priority customers
Mains replacement	Customers asked us to do more mains replacement to improve safety and the environment but this was not supported by Locals Authorities. Ofgem also set a 'high bar' for any ramp up.	The labour market limits our ability to increase repex so our programme is in line with HSE requirement and supports the views of local authorities. Our net zero uncertainty mechanism includes provision for a ramp up to support heat decarbonisation.
Company cars and mileage	Regional stakeholders disagreed with our focus on company cars alone – they said it was too narrow and needed to focus on all our operational travel.	Our commitment now reflects their feedback and we will explore green alternatives for our operational fleet. We have also increased our ambition to have zero emissions fleet by 2035 to support biodiversity and improve air quality.
Net zero ready network by 2035	Many customers want us to invest now in a low regrets approach however there were differing opinions on who pays for this from customers, to government to developers – majority didn't want to see large bill increases for this.	To deal with this conflict we have costed up a 'no regrets' proposal which offers less risk than a 'low regrets' proposal however we have not included this in base funding and to protect customers we have proposed an uncertainty mechanism.
Investing in innovation and working collaboratively	Whilst innovation was widely supported there were differing opinions on the balance of innovation that delivers in the short term RIIO-2 timescales vs the investment needed to deliver longer-term UK climate change targets.	Our proposal is now balanced to include WWU funded projects that are more certain and deliver in the shorter term in addition to a new innovation allowance for projects addressing UK-wide future energy system transition issues. On the latter, we are committed to working collaboratively with BEIS, Ofgem and the wider industry.
Innovation collaboration	Whilst there was support that collaboration was beneficial there was a conflict that this approach may not be compatible with competition – need a stronger incentive on this to better achieve shared goals.	The sector has matured from working in isolation to being highly collaborative and the NIA will continue to play an important role in this. Our established approach will continue to facilitate a highly collaborative programme for shared costs and benefits.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

7. CEG and RIIO-2 Challenge Group (CG) challenges

CEG challenges informing our plan

The appointment of a CEG has helped to drive our approach to engagement in GD2 and we have warmly welcomed this development in the regulatory framework.

The CEG is delivering significant value and has provided us with challenges that have helped to shape our thinking and our plan.

At a high level, they challenged us on our overall business vision and long-term strategy, our ambition on sustainability, our CVP evaluation methodology and outcomes and our Theft of Gas ODI. They also commented that our outputs were not fully justified in our earlier submissions.

We will strengthen our consumer voice by continuing the Customer Engagement Group.

The most significant challenges we received from the CEG in reference to our engagement approach planning phase have related to:

- stakeholder definitions and segmentation;
- strategy and governance – including how we embed engagement into our business planning;
- triangulation and gap analysis;
- regional differences and addressing the issues around diversity;
- topics – specifically challenging us to engage on 'the hard issues of bills, sustainability and vulnerability' and consider the trade-offs;
- conflicts and risks.

Within each chapter of this plan, we address the relevant CEG challenges. In summary, and by Ofgem category, they challenged us in the following areas:

Meeting the needs of consumers and network users: The CEG was concerned that our ICS commitment was based on a small-scale prompted survey and challenged us to look at best practice elsewhere before developing our Community Fund. They also questioned the fact that we did not have a vulnerability strategy; that we were insufficiently demonstrating the outcomes we wanted to achieve for those living in vulnerable situations; and that our partnership approach was insufficiently strategic.

Our FPNES ambition in GD2 being lower than it was in GD1 attracted comment from the CEG. They also wanted us to better justify what is best for customers, with clearer links to fuel poverty and to our vulnerability strategy, and to the future of energy.

Delivering value for money: We have been consistently challenged on our 0.5% efficiency proposal. The CEG's view is that this lacks ambition. This remains our only open challenge from the group.

With regard to our innovation portfolio, the CEG expressed that it was too heavily focused on technical engineering and lacked consideration of customer service and vulnerability innovation.

Delivering an environmentally sustainable network: The CEG challenged our early net zero strategy, commenting that it was too narrow and did not adequately consider scenarios from other sources. They also questioned the level of ambition in our first draft Environmental Action Plan, noting that the focus was on compliance rather than proactive leadership and that we had undertaken limited engagement.

Maintaining a safe and resilient network: We were challenged to demonstrate how the different workload drivers impacted on investment and how this linked to monetised risk and ultimately to benefits for consumers. The CEG also wanted to better understand how we bring the needs of vulnerable customers into our asset investment decision making.

Increases in repex costs were also flagged by the group; first to clarify their understanding and secondly around the robustness of the evidence we were providing about these cost increases.

The CEG also challenged our new theft of gas bespoke financial ODI, questioning in particular why we should receive a share of the benefit from this initiative. They commented on the limited scope of our diversity strategy and that our cyber resilience chapter failed to fully identify risks and solutions.

Click **Appendix 5I** for a summary of the CEG feedback and our response.

Click **Appendix 5J** for more information on the CEG governance.

RIIO-2 CG challenges informing our plan

The RIIO-2 CG has challenged us in a number of areas which have served to strengthen our plan.

In response to their feedback, we have strengthened our engagement proposals, included stakeholder trade-offs and shown how they and the CEG have influenced our plan. We have also clearly demonstrated how we plan to be a resilient entity in GD2. Our outputs and incentives were identified as not being justified sufficiently and our October plan included further justification in response to this.

Following Ofgem's letter regarding net zero, the RIIO-2 CG was keen to see how this broader scope had been incorporated into our plan. We now demonstrate the pathway to achieving our ambition of a net zero ready network by 2035 along with a number of detailed appendices with supporting evidence.

Our ambition with regard to our 0.5% efficiency proposal, the FPNES and our EAP also attracted comment from the CG, and like the CEG, they flagged the increases in repex costs at deep dive sessions in October 2019.

Click **Appendix 1E** for more information on our response to the RIIO-2 Challenge Group.

223

challenges received from the CEG, 222 resolved.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

8. Engagement into the future

Our evolved strategy will ensure a robust focus on stakeholder engagement through GD2 and will take account of our lessons learned in GD1.

Click **Appendix 5A** for a summary of lessons learned.

Setting targets for the future

We will baseline our current performance on our commitments at the end of GD1 to enable effective target setting for the business across the GD2 timeline for delivery of our commitments and other deliverables. From here, GD2 engagement will be planned to make sure we take full account of the lessons learnt to date. We will start with perception testing of our commitment baselines with our stakeholders to help us develop regional delivery plans.

We will also develop commitment delivery milestones with customers and stakeholders and discuss their communication and engagement preferences. Then we will re-engage with the stakeholder groups with whom we originally developed commitments, taking care to check for new or emerging segmentations. We'll also fill gaps noted through our evidence triangulation, an exercise that we will continue during the rest of GD1.

This will be critical in the development of our engagement programme for GD2, which can be scrutinised quarterly by the CEG.

Taking engagement further

We are seeking to build on what we have learnt from our current engagement and research in GD1. Consumer and stakeholder data and statistical analysis, mapped to regions and to increasingly defined consumer and stakeholder demographics, will enable us to develop our engagement further. This, in turn, will support increased, more in-depth and bespoke opportunities for a wider range of stakeholders to contribute to our work.

Our GD2 focus areas

Enhanced collaboration and challenge in GD2

In GD2, we are ambitious and want to challenge ourselves to continuously improve our stakeholder engagement. Ongoing collaboration and consultation with engagement specialists, topic experts and interested parties within our communities will be central to driving our success in GD2. In order to facilitate this, we propose:

- an enduring role for the CEG during GD2 – to provide independent assurance of delivery of our RIIO-2 business plan in line with stakeholders' priorities and expectations. Our plan has benefited significantly from the group's scrutiny in the lead up to submission. This analysis has not only helped to shape our plan but has changed the way we operate, encouraging greater cross team collaboration and transparency. In our commitment to sustainability this ongoing challenge will serve to keep us on track to achieve this ambition;
- that Ofgem's own assessment process could be realigned to allow for independent and continual assessment of network companies' Stakeholder Engagement Strategy and programmes, taking principles from assessment guidelines such as the OGC Gateway Process peer review technique. CEG Members would assess customer and other stakeholder engagement and subsequent actions in delivering our GD2 business plan and additional customer benefits. This independent involvement would allow for a deeper and prolonged scrutiny of engagement plans and costs and drive improvements;
- the CEG has a budget to allow for its own independent stakeholder research, to provide additional levels of assurance of our engagement quality;
- an annual CEG stakeholder assessment report to accompany an annual stakeholder engagement report from the company to Ofgem, in addition to an annual report for stakeholders on our engagement activities.

Our commitment

Evolve our GD1 Critical Friends Panel and create a new GD2 Citizens' Panel, in a 'centrally facilitated, locally delivered' approach to enhanced engagement.

Click **Appendix 5F** for further information on our engagement.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

Scope of engagement activities for RIIO-2

The broad scope of our GD2 engagement activities has been discussed with the CEG, as well as with our Critical Friends Panel, and customers taking part in enhanced engagement via Educated Customer Panels.

Our approach for GD2

Below, there is a summary of our GD2 stakeholder engagement plans, using the same four categories as our enhanced programme. This will inevitably evolve as priorities and topics of interest change over the period, particularly in light of our sustainability vision and net zero ready by 2035 commitment.

We've increased our engagement investment through GD1 and will evolve our 'centrally facilitated, locally delivered' strategy, using operational colleagues alongside our network of Stakeholder Champions and Gas Safety Ambassadors.

The ambassador role will be evolved into STEM ambassadors to support energy futures messaging and education campaigns. This is supported by an increased level of annual investment in GD2. Investment in external resources to support our strategic evolution will continue, as well as to carry out qualitative and quantitative research and provide assurance to our Board and to Ofgem. We will carry out an independent relationship scan of business relationships with stakeholders twice during GD2, to drive best practice engagement and support continual embedding of engagement across the business.

We'll continue to communicate with stakeholders via a monthly e-newsletter, summarising engagement and delivery, as well as signposting future opportunities to get involved. We'll also be reporting under the SDGs and Wellbeing of Future Generations (Wales) Act which will be new for GD2. Our reporting plan will be tested with stakeholders in 2020, along with a detailed sustainability delivery plan.

WWU stakeholder engagement evolution

2013 – Start up
- New reporting requirements.
- Establish relationships.
- Create a team and a programme.

2013/14 – Build
- Capturing good customer practice.
- Creating stakeholder processes.
- Education internally.

2014/18 – Embed
- Change how we do things.
- Feedback influencing operational decisions.

2018/19 – Influence
- New strategic stakeholder strategy for pre-GD2 engagement.
- Feedback influencing strategic decisions.

2019 onwards – Sustain
- A stakeholder focused business plan.
- Ready for the future.
- Stakeholders influencing our future plans and our day to day decisions.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

Engagement plan for GD2

Category 1 Existing data mining and customer segmentation

Use our Alva sentiment analysis tool, to gauge live and trending topics of interest to customers.

- Analyse trends and topics of interest from data gathered from regulatory and internal customer feedback.
- An annual review of the segmentation customer and stakeholder segmentation and domestic customer personas, to ensure accurate reflection interaction with business activities, including regional and other differentiating factors.
- More use of existing research from inside and outside the sector to reduce unnecessary research spend and provide value for money engagement, and development of a company research repository as a whole business insight resource.
- Commit to annual quantitative customer research study to supplement qualitative customer engagement with topics informed by stakeholders' priorities as identified in category 2, as well as in support of operational and strategic plans.

Category 2 Broad engagement – establishment of priorities

- Qualitative customer focus groups in support of operational and strategic plans.
- Evolution of Critical Friends Panel to be more regionally representative, with more regionally accessible meetings.
- Continue an annual series of regional community workshops, independently facilitated, with sessions enabling us to report on company activities in areas stakeholders expressed an interest in, with discussions held in smaller groups.
- Ad-hoc questionnaires to seek feedback from specific groups on particular areas of interest.

Category 3 Strategic/targeted engagement

Collaborative gas network engagement through ENA GDN stakeholder group, to support national stakeholders and expanded to include transmission and an evolved remit to include best practice engagement outside of energy and utilities. Biomethane engagement across networks will also be included in an expanded remit, to encourage broad, informed and consistent engagement across the UK.

- Hyper-local community engagement, led by the stakeholder team, including local operational involvement – looking at local issues. These may be topics of interest raised by the community, engagement in advance of new replacement projects or opportunities in advance of net zero.
- Expanded involvement in regional infrastructure strategy groups – supporting holistic view of significant infrastructure developments and enabling longer-term joint planning to support development and minimise disruption in local communities.
- Annual site visits for major users complemented by quarterly webinar/webex/e-meetings and sessions to update and involve these stakeholders.
- A Wales Green Gas Panel to also promote biomethane best practice and support Welsh Government decarbonisation plans.

Category 4 Acceptability testing of the business plan

- Regular AA1000SES audit of our stakeholder performance.
- Use of our SROI tool to assess the benefit of initiatives and activities.
- Continue use of acceptability testing for any unexpected plans – particularly changes in light of our net zero commitment.

Click **Appendix 5K** for our AA1000SES independent assessment.

Click **Appendix 5A** for Our Journey and Lessons Learned Log.

Chapter 5. Giving customers and stakeholders a stronger voice (continued)

9. Our annual business stakeholder performance

Cost of our approach		
£m (2018/19 prices)	GD1 ave pa	GD2 ave pa
Stakeholder expenditure	0.6	1.1

We are proposing an increased investment in GD2 of £0.5m to support the requirements of enhanced engagement. This is included in baseline costs.

In response to the request for clarification from the RIIO-2 Challenge Group, specific drivers for these costs are:

- the continuation of the CEG (£0.3m per year) – including the payment and expenses of members, a small research budget and report writing costs;
- the creation of the new Citizens Panel (£0.03m per year)– including payments to retained members for consistency;
- the evolution of the Critical Friends Panel (£0.06m per year) which will require additional facilitation and report writing costs;
- the creation of a Wales Green Gas Panel (£0.03m per year).

The continuation of our commitment to an enhanced Stakeholder Engagement Team throughout GD2 accounts for the additional £0.1m of increased costs.

Proposals to measure the value and impact

We will measure the value and impact of our engagement programmes using our Social Return on Investment tool as well as a new sustainability index to rate progress, which will be included in our annual sustainability reporting.

AA1000SES rating

We are committing in GD2 to an annual audit against the stakeholder engagement AA1000SES standard.

We have had an independent assessment against this standard to RAG rate our approach to engagement for this business plan submission.

Click **Appendix 5K:** AA1000SES rating.

We will measure the value and impact of our engagement programmes using our Social Return on Investment tool.

The following table shows the results of this assessment.

AA1000SES rating	RAG		RAG
Commit to the AA1000 accountability principles	●	Mobilise resources	●
Integrate into organisational governance	●	Build capacity	●
Integrate into organisational strategy	●	Identify and prepare for engagement risks	●
Integrate into organisational management	●	Invite stakeholders to engage	●
Establish the purpose of engagement	●	Brief stakeholders	●
Establish the scope of the engagement associated with the purpose	●	Engage	●
Mandate and ownership	●	Document the engagement and its outputs	●
Stakeholder identification	●	Develop an action plan	●
Profile and map stakeholders	●	Communicate engagement outputs and action plan	●
Determine engagement level(s) and method(s)	●	Monitor and evaluate the engagement	●
Establish and communicate boundaries of disclosure	●	Learn and improve	●
Draft engagement plan	●	Develop and follow up on action plan	●
Establish indicators	●	Report on engagement	●

Conclusion

Everything we do as a responsible and sustainable business must be informed by our customers and stakeholders.

During GD1, we have made significant steps to improve our stakeholder engagement processes, reviewing our strategy and further embedding stakeholder engagement across the business.

We commit to stretching ourselves even more in GD2, proactively listening to what customers and stakeholders are telling us matters most to them.

We will forge new partnerships and make stronger connections with organisations that can help us better understand our customers – all to ensure that we can deliver an exceptional and inclusive service for our customers, long into the future.

Chapter 6. Customer service

1. Highlights of our plan

- Our customers have played a principal role in shaping our plans for today and tomorrow and have asked us to maintain our excellent levels of customer service.
- Customer expectations are continuously increasing, making it a challenge to maintain customer service excellence performance in GD2 at the current levels.
- We are targeting an overall CSAT score of 9.2 in GD2, compared to 8.6 in GD1.
- Our continued ICS ServiceMark accreditation will demonstrate that we're delivering UK leading service.
- We will push ourselves to consistently resolve over 85% of complaints in just one day.
- Delivering great service will continue to be a fundamental part of our culture with colleagues focused on this from their very first day with us through induction, training, performance management and coaching.
- We will go beyond our regulatory requirements when customers need more tailored support, communications or services.
- We are committed to minimising the duration of all interruptions and limiting our average unplanned time to under 10 hours.
- Following positive feedback, we will invest in more Customer Support Officers (CSOs) to increase our face to face communication with customers.
- We will pay higher GSoP payments and additional voluntary payments when things go wrong.

85%

of complaints resolved within 1 working day in GD2.

9.18/10

scored in our customer satisfaction surveys in 2018/19.

We will increase compensation when things go wrong.

2. Our GD1 performance

We have delivered excellent levels of customer service in GD1 and are very proud of our performance.

In summary:

- We're the only GDN to receive ICS ServiceMark Distinction status.
- Our customer satisfaction scores (CSAT) have improved from 8.69 to 9.18 since 2013/14.
- Our complaints volumes have reduced by 40% in GD1 from 2,519 to 1,514.
- We're currently resolving 84% of complaints on day one, that's up from 45% in 2013.

- We're performing very well against the GSoP and have voluntarily doubled payments since 2017/18.
- We consistently go above our regulatory targets, attending emergencies in under an hour on average.
- On average, our customers only experience a gas interruption once in their lifetime.
- We're one of the quickest GDNs to restore supply – three and a half hours for a planned interruption and eight hours for unplanned.
- We've created a 'customer-first' culture amongst colleagues in GD1 to drive success.
- We were the first network to develop a Connections Online Quotations portal.
- We have led industry changes that will allow suppliers' customer details to be shared, to enable bespoke communications for those impacted by our works from 2020.
- We rigorously measure our customer service performance using live customer service performance dashboards, CSAT score analysis, daily exec-led teleconferences and regular benchmarking and auditing of our processes.

Chapter 6. Customer service (continued)

3. Our customer first culture

Since 2005, there has been a cultural shift in the business, moving from a mainly engineering-focused company to a now also customer-focused one. This has strongly influenced our customer service journey (see below). The customer is now at the heart of everything we do and this was further reinforced by the introduction of new company values in 2013.

We take every opportunity to improve service for customers and focus on exceeding their expectations.

- We celebrate great service, holding an annual colleague Customer Conference; an opportunity for the whole business to come together to shape our future plans and customer services.
- In 2015 we introduced our Customer Service Championship Cup. This fiercely-fought annual competition encourages cross-functional collaboration and teamwork to drive innovative solutions to known customer service challenges. Our CSOs initiative is just one of the many successful innovations to come out of this competition to drive our performance.
- Customer service is also a central theme in our colleague Celebrating Excellence Awards where we take pride in showcasing our best examples of service excellence.

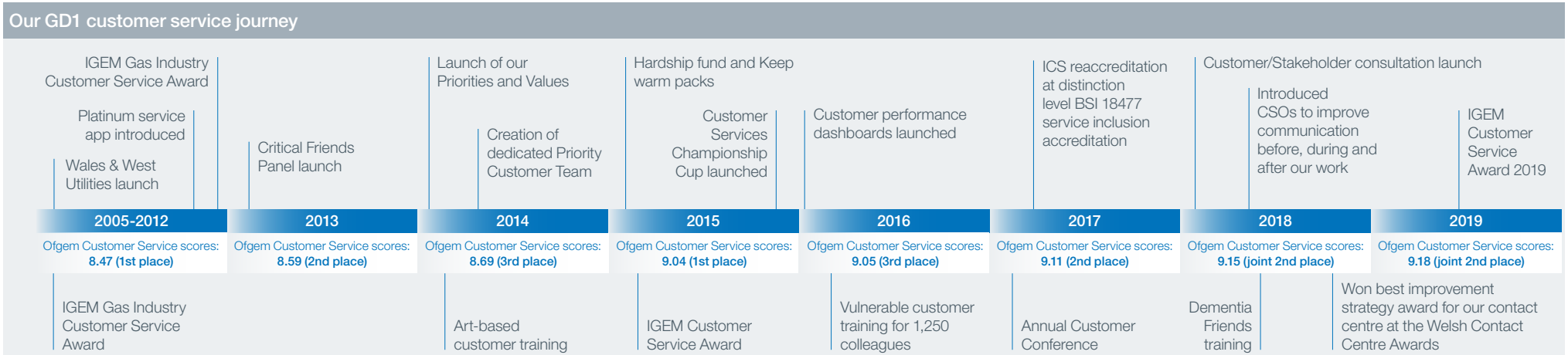
Our Customer Service Strategy is based upon the Institute of Customer Service Model and is owned by our Executive team and closely aligned with our Stakeholder Engagement and Consumer Vulnerability strategies.

Click **Appendix 6A** for further information on our Customer Service Strategy.

Our Customer Service Steering Group deliver our strategy and meet monthly with operational colleagues to review regional performance and monitor projects, discuss the latest research and sign off any new initiatives and innovation projects.

In preparation for GD2, we have introduced a new omni channel call centre system in October 2019 and begun a trial of new customer satisfaction survey questionnaires and channels. New IT systems to be rolled out in 2020 will put the customer firmly at the heart of all decision making and reporting.

Our GD1 customer service journey



Chapter 6. Customer service (continued)

4. Understanding our customers

We have to work harder to understand our customer base, given that we don't interact directly with most of our customers, unless our works impact their property or community, and we don't bill directly for our services or maintain a customer database.

Our range of customers


Domestic customers


Vulnerable customers


Residents of multi occupancy buildings


Small businesses


Large businesses


Shippers and suppliers


Local authorities


Power generators


Developers


Third sector organisations

We have used feedback to map customer journeys through our key processes. Our research – which included 27 attitudinal statements – has allowed us to segment customers into four categories with personas and attributes attached to each. We have been able to identify customer drivers and where they would need the most support, along with what they see as their greatest frustrations and their communication preferences. This work will enable us to pre-empt their needs to create highly satisfied customers who feel looked after, understood and considered.

We serve a diverse group of people in differing regions, with different rules and regulations as a result of the devolved Welsh Government. We need to make sure that our customer service levels remain high across all areas and that we do not leave anyone behind.

Our worst-served customers

Ensuring customers all get a level of service they expect, which meets their individual needs.

Whilst our headline performance against all measures is very good, we recognise that a minority of customers are not as well served. To improve our performance in GD2, we are developing tools that will help us better identify and manage these 'worst-served' customers.

Our Customer Performance dashboards are accessed by managers across the business and discussed at the Executive-led Customer Steering Group and allow us to compare performance by:

- Worktype.
- Geographical area – down to postcode.
- Delivery by direct labour or contractor.

Whilst we don't hold detailed demographic data for customers, we plan to develop our capability to use demographic data at an area level to further segment customers in GD2.

In some cases, we can manage customers in real-time such as supporting those left off gas for more than 24 hours by offering not only alternative heating and cooking, but hot meals, transport, or alternative accommodation until we resolve the issue. In other cases, the root cause analysis of an issue or complaint will highlight areas for improvement in a process or the local delivery of a service.

The following table explains how we currently measure 'worst-served' customers, what our performance targets are and what positive actions we will take to address these issues.

We will also introduce a suite of voluntary payments to ensure all customers are included and enhance the statutory GSoP payments.

Measurement of 'worst-served' customer

Measure	Internal target performance	'Worst-served' measurement	Action
Customer satisfaction	9.18 /10	Individual customer satisfaction score of less than 7/10.	Contact customer where details are available to discuss and see if we can do anything to resolve outstanding issues.
Complaints	85% resolution in D+1 95% resolution in D+31	Geographic areas where D+1 / D+31 resolution is less than 75%.	Operations Managers will address localised issues supported by the office to provide additional training.
GSoP	100% on each measure	Any GSoP failure.	Investigate all failures, pay compensation plus any other reasonable costs and undertake root cause analysis of failures.
Interruptions	Average less than 10 hours for unplanned and 3.5 hours for planned interruptions	Any customer off gas for more than 12 hours. (Gas off to gas back at appliances.)	Offer additional support until back on gas and pay all reasonable costs. Safeguard during the interruption and automatically pay voluntary compensation of £25 where interruption is longer than 12 hours, in addition to GSoP.
Connections lead times	Less than 20 working days	Lead time for domestic connections is beyond 20 working days for a customer who is ready for works.	Liaise with Operation Managers to identify additional resources to deliver the work to meet customer requirements.
Poor pressures	Resolution in 30 days	Customers who experience more than 2 interruptions to supply in a year.	Asset Management and Operations will seek interim and final solution to resolve the issue.

Chapter 6. Customer service (continued)

5. What our customers and stakeholders are telling us

We have engaged in 20,000 face to face community conversations, to discuss our work and services with the people that rely on them. Safety remains the top priority for our customers, and they want us to minimise the disruption our services cause to them and their communities.

The CEG has challenged us to address the root causes of complaints, and to better understand who our worst-served customers are. In response to customers' requests for clear, timely and bespoke communications, we will tailor our approach, investing in self-service tools such as customer apps, whilst maintaining traditional communication channels for those who prefer them.

Engagement informing our commitments

Attend gas emergencies in under an hour on average, to keep our customers safe. Safety is the most important priority for our customers and stakeholders. Based on engagement with over 2,500 people, we know that attending gas emergencies in under an hour is accepted by stakeholders. This was not initially a commitment in our July plan, however given the significant feedback, we decided it was a critical service that should not be overlooked. In regional workshops, 96% of attendees agreed that an hour's response time was appropriate.

Overall, both SMEs and domestic customers considered this to be the most important commitment and the one they are willing to pay the most for out of all of our commitments. There were regional differences regarding this commitment, with SMEs in England showing more support for it than those in Wales.

Maintain our ICS accreditation and the BSI for inclusive service provision. Our ICS commitment received a low score during our summer 2019 acceptability testing. Customers also highlighted that they would not be willing to pay more for us to deliver this commitment. The CEG challenged that our ICS commitment was based on a small-scale prompted survey, and was not part of the standard ICS ServiceMark survey. However, we went on to evidence that the assessment criteria is based upon a statistically robust external benchmarking survey. The CFP responded more positively, saying that it fosters trust amongst customers, and some customers in vulnerable situations commented that the accreditation provided them with 'peace of mind'.

Stakeholders had mixed awareness of BS 18477, and acceptability for the commitment itself was low. However, our engagement shows that supporting customers in vulnerable situations has a high perceived value for domestic customers in particular, and our commitment will ensure we are measured against best practice. Noting the conflicting feedback, we are proposing these as reputational, not financial ODIs.

Increase our commitment to reliability by promising an average time off gas of less than 10 hours for unplanned interruptions through a new LO. Despite achieving some of the shortest interruption times across all GDNs, stakeholders tell us that we need to do more to minimise interruption times. The CEG stressed the importance of minimising the volumes and durations of our interruptions, whether planned or unplanned. 99% of those attending our regional workshops in 2018 asked as part of our 'Let's Connect' consultation campaign said keeping gas interruptions to a minimum was 'important/very important'. Consumer vulnerability engagement revealed the significant impact interruptions can have on customers' emotional wellbeing.

Acceptability testing has shown us that fuel poor customers place more importance on reliability than those who are not fuel poor and over 55s are more likely to rate emergency gas interruptions as important vs their younger counterparts. Both domestic and SME customers demonstrated a strong willingness to pay for this commitment, second only to emergency response.

Enhanced compensation for failures under the Guaranteed Standards of Performance and voluntarily pay customers £25 if their gas is interrupted for longer than 12 hours. Over 19,500 stakeholders were supportive of our commitment to pay automatic compensation when a gas interruption exceeds 12 hours. 62% scored resolving complaints quickly and compensating customers when things go wrong as 'important'.

Those in fuel poverty place more importance on reliability and compensation than those who are not living in fuel poverty. Qualitative and quantitative feedback from stakeholders revealed that stakeholders supported higher payments than those proposed by Ofgem, however they were not willing to pay towards this compensation.We did not include this commitment in our July plan as we already had a commitment around limiting average time off gas to under 10 hours. We did however want to commit to voluntary enhanced compensation payment for failures under the Guaranteed Standards of Performance when things go wrong.

There was some discrepancy around how much compensation payments should be, varying from £50 (CFP) to those who felt effective communication was more important than financial compensation. We propose to set the level of compensation at £25 with a view to keeping this under regular review.

Click **Appendix 5F** for further information on our engagement.

Chapter 6. Customer service (continued)

6. Summary of our GD2 outputs

Customer service outputs — Click **Appendix 3A** for further justification on these outputs

Measure and type	Explanation	Proposal/target	Stakeholder views	2018/19 performance	Comparative performance	Other requirements	Customer benefits
Common output measures with a common target							
Customer Satisfaction Survey ODI F	A financial ODI with penalties and rewards based on customer satisfaction survey scores across the three key work areas: – Emergency work – Planned work – Connections work	Based on the current methodology, we are looking to achieve an overall score of 9.2 /10 across the three surveys. Ofgem will confirm the new baseline scores and penalty and reward mechanism following the trial in 2019/20.	Stakeholders recognise our excellent performance in this area and want us to maintain our performance while evolving our services to meet changing needs.	9.18/10 overall Emergency 9.56 Planned 8.80 Connections 9.18	Currently second GDN in overall scores behind SGN Scotland, with overall score of 9.18/10 for 2018/19. Planned work score 8.8/10 ranks us fourth.	Revised questionnaire and change of survey channels to be trialled between October 19 and March 20. We support static targets with an absolute reward or penalty – yet to be determined by Ofgem.	The CSAT output in GD1 has led to a step change in customer service levels, innovations and healthy competition across the GDNs. Customers are receiving an overall better service as a result.
Complaints Metric ODI F	A financial ODI with a penalty only to incentivise the timely and high-quality resolution of complaints. Focused on resolution times, repeat complaints, and Ombudsman complaints.	Maintain performance in dealing with complaints while addressing the root causes of complaints and driving down the volumes – whilst also ensuring compliance with the Complaint Handling Regulations.	Stakeholders recognise and support our prompt response while ensuring the quality of our responses. The CEG have challenged us to further address the root causes of complaints.	We achieved a score of 2.51 against a target score of less than 11.57 to avoid a penalty. 84% of complaints resolved in one working day in 2018/19.	Overall in GD1 our complaint score places us 2nd behind NGN. The overall GDN GD1 average score is 7.27.	Ofgem have confirmed that the complaint metric will be calculated in the same way in GD2. The target score is yet to be determined by Ofgem.	Customers can be assured that when they are not happy with our work, their complaint will be resolved quickly and with a quality mutual resolution.
Guaranteed Standards of Performance (GSoP) LO	A set of legal minimum standards with associated compensation relating to our core services for interruptions, connections and customer service (compensation excluded from base totex)	Minimise failures and make all payments automatic by GD2. We are committing to maintaining our GD1 payment levels where we will pay between 45% and 66% more to each customer than the statutory payment.	Stakeholders want us to minimise failures and focus on looking after worst-served customers. However, there was no consensus on the level of payments or new GSoPs. Citizens Advice and other stakeholders want to see automatic payments.	Met licence obligations. Payments of £80k paid to customers under the statutory scheme and the voluntary scheme.	Good performance against most standards in comparison to the other GDNs. Paying double payments for failure since 2017 compared to statutory requirement.	No clear driver for new GSoPs but some appetite for appointment standard. Please see our bespoke outputs for details of the voluntary GSoPs commitment to connections customers and voluntary payments for interruptions.	Customers will be automatically offered compensation for all standards in GD2, avoiding the need for the most vulnerable customers to claim payments. They will receive higher payments than the statutory requirements.
Emergency response time LO	LO to attend 97% of gas emergency calls within 1 hour for uncontrolled and 2 hours for controlled escapes.	Commitment to meet this LO while controlling costs.	Stakeholders rank this as their top priority and an area they are most willing to pay for, agreeing an average of 1 hour to attend emergencies was acceptable whilst also flagging the importance of prioritising support for vulnerable customers.	Uncontrolled 1 hour 99.8%. Controlled 2 hours 98.9%.	We have met the LO every year during GD2 whereas some GDNs have failed in at least one year.	Control the costs of the service while exceeding our LO. Additional commitment to attend all gas escapes in under an hour.	Customers can be assured that we will respond to emergencies in under an hour to keep them safe. We will also identify registered vulnerable customers and prioritise their calls where practical to do so.

Chapter 6. Customer service (continued)

Customer service outputs

Click **Appendix 3A** for further justification on these outputs

Measure and type	Explanation	Proposal/target	Stakeholder views	2018/19 performance	Comparative performance	Other requirements	Customer benefits
Common output measures with bespoke targets							
Average restoration time for unplanned interruptions ODI F	A financial penalty ODI: the average time taken to get supply back on after an unplanned interruption. Major incidents involving over 250 properties will be weighted.	To keep our annual average unplanned interruption time below 10 hours.	Our Critical Friends Panel (CFP)supported the GD1 target of 24 hour restoration 90% of the time. 62% of customers said our new average under 10-hour interruption proposal was acceptable to them and overall they were willing to pay more for this.	6 hours (average) excluding large incidents. 9 hours (average including large incidents)	Our GD1 average performance of 8 hours compares to a GDN average of 26 hours. This comparison falls to 14 hours if Cadent London are excluded. NGN are the only other gas network with an average in GD2 of below 10 hours.	Direct link to GSoP1 – and a new bespoke output – voluntary payments for 12 hours interruption including 2 hours to connect appliances. Our ambition is to deliver our 6-hour GD1 performance (excluding large incidents).	All customers will benefit from shorter interruptions on average. Vulnerable customers are safeguarded during interruptions including alternative heating and cooking, keep warm packs or alternative accommodation and hot food where required.
Bespoke output measures							
ICS ServiceMark Accreditation ODI R	Reputational ODI benchmarking against the best customer service providers in the UK.	Maintain our ICS ServiceMark accreditation.	Stakeholders have been split over this proposal.They have accepted that the cost is low and that there are benefits in building trust with customers. Hence we propose a reputational rather than financial ODI.	ServiceMark accreditation with distinction status. 93.6/100 external benchmarking survey. 84% on internal business ServiceCheck survey.	Utility average 74.7/100. NGN also have the ServiceMark accreditation. Nationally recognised benchmarking across all UK business sectors.	We will access the latest research, innovation and best practice provided by ICS to improve our service further.	ICS ServiceMark gives customers trust in us if they do not know the WWU brand. Membership of ICS will help keep our service levels high to all customers. We will return the £15k (<1p per customer) annual costs to customers if we lose the accreditation.
Enhanced GSoPs ODI F	A penalty only incentive where we will automatically pay additional compensation to customers over and above the statutory GSoPs (compensation excluded from base totex).	Proposed payments will be 45-66% above those being proposed by Ofgem – in line with the level of our GD1 doubling of payments.	Our CFP could not reach a consensus on payment levels, however the doubling and automatic payments were supported by Citizens Advice. These outputs were supported by 65% of stakeholders and have been discussed with the CEG.	Doubled payments resulting in an additional £80k of payments to customers.	Only one other network – NGN – currently pays double GSoP payments, they also make these payments automatically when they fail.	We will publish our new commitment in our customer charter and automatically make all payments. We will minimise the failures through effective processes, systems and resourcing.	When things go wrong, customers will receive compensation that is more reflective of the inconvenience caused by the poor service than the statutory requirement.
Voluntary interruption payments ODI F	A package of voluntary compensation payments for planned or unplanned interruptions lasting more than 12 hours (gas to appliances) and a new 2-hour standard if a customer was not home when we completed our works (compensation excluded from base totex).	We will pay £25 if a customer is without gas at their appliances for more than 12 hours. We will pay £20 if we do not attend a customer's property within 2 hours of a call to us or within an agreed appointment time.	Our studies revealed that 62% of respondents scored resolving complaints quickly and compensating customers if things go wrong as 'very important'. Reliability is a top priority and our national engagement showed some support for an appointment standard.	New for GD2.	NGN have been paying some voluntary payments to customers for interruptions in GD1.	GSoP1 will still apply to unplanned interruptions longer than 24 hours. We will publish our new commitment in our customer charter and automatically make all payments.	This new standard will ensure customers are appropriately compensated for interruptions to their gas supplies providing additional protection well above the statutory requirements. They will also be compensated if they don't receive a prompt response.
Connections voluntary GSoPs ODI F	We will be extending the quotations GSoPs to isolations, larger development sites and mains diversions as well as for green gas enquiries (compensation excluded from base totex).	We will mirror the equivalent GSoP timescales and payments for these work types.	A review of our performance shows these customers receive a worse level of service compared to others and the principle of paying compensation to all was supported.	New for GD2.	We will be the first network to pay compensation for these types of works.	We will publish our new commitment in our customer charter and automatically make all payments.	All connections customers will receive a similar level of service and compensation payments when we fail to meet timescales or our quotations are not accurate.

Chapter 6. Customer service (continued)

7. Our GD2 focus areas

Customer service

Our overall ambition for GD2 is to better understand our customers so that we can create a tailored approach to service and communication. We will deliver for customers on the above outputs by focusing on the following areas:

- Continuing to strive for customer service excellence.
- Identification of customers living in vulnerable situations (see our social obligations plan for more detail).
- Connections business.
- Planned interruptions.
- Unplanned interruptions.

The increased GSoPs form part of our CVP, benefitting all groups of customers through higher levels of compensation payable when things go wrong.

Our commitments

Maintain our ICS accreditation and the British Standard for Inclusive Service provision. We propose these as bespoke reputational outputs.

Enhanced compensation for failures under the GSoP and voluntarily pay customers £25 if their gas is interrupted for longer than 12 hours. We propose a bespoke penalty only financial incentive to support this. CVP

Customer service excellence

	Customers and stakeholders said	In GD2, we commit to…	Our GD2 planned activities
Service levels	We should maintain current levels of customer service. Stakeholders have told us that scores above 9/10 are excellent.	At least maintain our customer satisfaction scores using an updated survey that better reflects customer priorities and obtaining feedback by phone for connections and emergency work, as well as an internet based survey. Retain the ICS ServiceMark accreditation and score over 90 in the external benchmarking survey.	Continue benchmarking ourselves externally via our ICS membership and understanding of changing customers' requirements and best practice. Invest in colleagues through values-based training and recognition and reward. Develop our service offering through a structured programme of stakeholder engagement and customer focus groups. Retain Customer Bureau and Complaints management team with dedicated priority customer experts and phone number.
Complaints	Our internal target to resolve 85% of complaints within D+1 is appropriate. We must target the root cause of complaints.	Score less than 2.5 under the complaints element of the Broad Measure of Customer satisfaction. Resolve 85% of consumer complaints with D+1 with no Ombudsman findings against us.	Continue Exec-led daily telephone conferences on new and unresolved complaints. Collect real-time data from site and customer, and build systems to allow quick collating of complaints information and issue resolution. Segment complaints data by PSR customers, area and demographics to tackle top three areas of complaints (communication, length of time to complete the work and quality of work).
GSoPs CVP	Stakeholders had little appetite for new GSoPs, but wanted changes to the existing ones.	To work to higher GSoP standards than proposed by Ofgem with tighter timescales and higher payments to customers. Where we fail a standard, the payment will automatically be paid to the customer for all standards.	Identifying and supporting worst-served customers. Introduce a suite of voluntary payments targeting and compensating the worst-served customers.
Communications	Customers want a choice of channels and clearer and more timely communications.	Invest in technology to provide omni channel service options. Maintain the traditional channels ensuring our services are fully inclusive and no one is penalised for their choice of channel. Continue to invest in our frontline CSOs. Click **Appendix 6B** for more detail on our CSOs.	Invest in self-service tools to reflect requirements. Comply with Welsh language directives.

CVP £320k additional GSoP compensation payable to customers in GD2.

Chapter 6. Customer service (continued)

Connections

Compared to GD1, customers will have more options to self serve or experience reduced timescales for the quotation from the office.

They will have the ability to track engineers coming to their homes, and when things do go wrong we will automatically pay compensation above the statutory requirements. This forms part of our CVP.

20,000

We'll provide 20,000 quotes per year to a wide range of customers.

Connections business

	Customers and stakeholders said	In GD2, we commit to…	Our GD2 planned activities
Quotations process	Our Online Connections portal is a great innovation, but can be hard to use for some. Customers do not rank the Connections application process very highly on the customer satisfaction surveys. Business and developers have told us they would like more ability to self-serve.	Re-launching our Connections portal developed with customer feedback and collaboration in GD1. Extend the range of services on the Connections portal in GD2 to include housing developers, demolition companies, Independent Gas Transporters and Utility Infrastructure Providers, biomethane and gas-fired power developers.	Provide more self-service channels across a full range of devices. These will be co-created with customers and tested via focus groups and trials.
Planning	Timescales are very important to customers. 'Time to provide a planned date' receives one of the lowest scores on the satisfaction surveys (despite us achieving 99.9% for GSoP 9 and GSoP 10).	Maintaining lead times for domestic customers below 20 days on average. Implement a 'track my engineer' app to allow customers to know who is coming to their house and when.	Implement new auto-allocation planning tools to optimise work delivery. We believe that these offer the potential to allow up to 80% of customers to get an immediate firm planned date upon payment.
GSoP CVP	When things do go wrong compensation should reflect the inconvenience caused.	Paying the same level of compensation as we are in GD1 which will result in payments at least 45-65% higher than proposed under the revised statutory requirements. Paying the equivalent of the statutory GSoP payment to those currently excluded (housing developers, isolations and diversions). Making all payments automatic.	Publish a WWU commitment and schedule of payments for Connections GSoPs on our website and in our customer charter.
Local authorities	Local authorities require utilities input into the development of their local development plans and site-specific consultations.	Build a layer on our GIS mapping system to hold local authority data on sites identified for development or redevelopment. Having a clear point of contact for enquiries from all local authorities that we deal with for local development plans and planning applications.	Attend local consultation events where we can have significant input and add value. Provide local authorities with a point of contact within our business to deal with consultations and development plan discussions. Exchange data on our mains replacement programme and other major projects such as reinforcement.

Chapter 6. Customer service (continued)

Interruptions and emergency services

Our commitment to compensate customers for interruptions over 12 hours forms part of our CVP. Based on customer profiles, we expect 95% of payments to go to domestic customers (25% will reach vulnerable customers.)

Our commitments

Increase our commitment to reliability by promising an average time off gas of less than 10 hours for unplanned interruptions through a new licence obligation.

Attend gas emergencies in under an hour on average, to keep our customers safe.

New Customer Support Officers improve customer satisfaction from 8.66 to 8.80.

CVP

Customers will benefit from £450k of voluntary interruptions compensation.

34,000

We will deliver an average of 440km of replacement mains and around 34,000 service interruptions per year in GD2.

Planned interruptions

	Customers and stakeholders said	In GD2, we commit to…	Our GD2 planned activities
Communications	They understand the need for works, but want: – more advanced communication of a project; – updates when project dates change; – more information on site.	Introduce a new advanced notice letter and simple and timely project updates. Provide a follow up reminder 48 hours before the confirmed interruption of the gas supply. Using CSOs as the key point of contact on replacement schemes. For more on our CSOs, see the case study on **Page 61** and **Appendix 6B.**	Use customer forums and feedback to evolve our letters and then automate via our new systems. Engage with a wide range of local stakeholders when planning works to minimise the impact to businesses and homes. Provide regular customer updates on interruptions, giving them the ability to track engineer visits (Track my Engineer App).
Time off gas CVP	Time off gas during a planned interruption should be kept to a minimum. If a customer is out when we visit, they do not like the commitment of 4 hours to attend when they contact us – and we should adjust this.	We will commit to the planned interruption lasting no more than 12 hours and paying a customer £25 where gas is not at the ECV and appliances in this timescale. We commit to responding within 2 hours (purge and relight) if the customer is out when we initially call. If we fail to do so, we will pay £20.	We will publish these payments on our website and in our customer charters and communications with customers. All payments will be made automatically.

Emergency service and unplanned interruptions

	Customers and stakeholders said	In GD2, we commit to…	Our GD2 planned activities
Emergency response	LOs of attending at least 97% of escapes within the 1-hour or 2-hour timescales is appropriate.	Continuing to meet the outputs defined in our licence of attending a minimum of 97% controlled escapes within 2 hours and 97% of uncontrolled within 1 hour, with an additional commitment to respond to all escapes in under an hour on average. Proactively supporting vulnerable customers that we have to cut off for safety reasons, keeping them warm and providing access to hot food.	Seek value for money by negotiation of the National Emergency Contact Centre contract. Effective utilisation of engineers. A review of how we deal with major incidents with local authority teams.
Time off gas CVP	Our average timescale of less than 8 hours (excluding large incidents) was seen as good performance.	To keep the average interruption time, including incidents, to less than 10 hours.	Voluntarily pay compensation if gas is off for more than 12 hours.
GSoP CVP	Customer should be financially compensated where the gas supply is not available for an extended time.	We will pay £60 to domestic and £100 to businesses for every 24-hour period that gas is unavailable (50% more than the statutory requirement). We will introduce a voluntary payment of £25 payable to every customer who is left off gas for more than 12 hours. We commit to responding within 2 hours (purge and relight) if the customer is out when we initially call, paying £20 if we fail to do so.	We will publish these payments on our website and in our customer charters and communications with customers. All payments will be made automatically.

Chapter 6. Customer service (continued)

Improving communication with Customer Support Officers

Following a drop in our customer satisfaction scores for planned work in 2017, we set about examining our scores, complaints and customer service data to try and discover what was causing this.

In-depth analysis revealed that our communication around planned work needed improving and was negatively influencing overall satisfaction scores.

In response to this, and to improve communication before, during and after the work, we rebranded customer communications and began a three-month trial, deploying CSOs over two geographical patches

The new CSOs were able to build relationships within the communities, recognising and addressing any issues and providing information and reassurance for customers.

They proved particularly useful at identifying any customers living in vulnerable situations and their specific needs.

The trial was deemed a huge success based on increased customer satisfaction scores, reduced complaints, a reduction in enquiry calls and improved efficiency. Five more CSOs were then recruited to start the 2017/18 financial year, covering our entire network.

From when the CSOs started in June 2018, we saw CSAT scores for planned work improve from 8.66 to 8.80 with a further improvements in 2019/20. We also moved from 4th to 2nd place in the GDN rankings. In the same period, complaints about planned work reduced by 12%, complaints about communication dropped by 44%, and customer calls reduced by 20%.

Based on the positive impact that the CSO role has had on our customer satisfaction scores, we are committed to increasing CSO numbers into GD2 and beyond. In May 2019, along with our planned work contract partners, we won the IGEM customer service award for our significant improvement in the customer experience for planned work.

In addition, CSO David Carter was a finalist at this year's IGEM Young Person's paper competition. His paper and presentation covers the evolution of the CSO role and is entitled 'Improving communication during mains replacement work'.

Click **Appendix 6B** for our CSO case study and CBA.

There is nothing you could do to improve the service I have received from all I have had contact with. All staff have been helpful, polite, informative, and friendly. When I have had questions, these have been answered quickly and completely.

You have the most professional staff, yet offer a service that feels like a family concern who care and take a rare pride in what you do. Companies like you make for a better future.

Feedback through our customer survey.

Conclusion

We know that although our performance during GD1 has been excellent, we must continue to drive our performance in GD2. Expectations are increasing and becoming more complex, and to maintain our scores as they are currently, we will need to work harder to deliver for customers in the future and stay ahead of the other GDNs.

We want to go above and beyond what people expect from their customer service experience. Informed by stakeholder feedback and rigorous data, we will treat customers as individuals by tailoring our communications and offering a bespoke service.

We will also innovate, bringing new services to customers. Track My Engineer tools will allow customers to know when an engineer will arrive. New self service options developed with our customers will transform their experience of dealing with us and offer 24-hour access to our services.

Chapter 7. Social obligations

1. Highlights of our plan

- We care about our customers and commit to identifying and safeguarding those impacted by our works, providing a fully inclusive service that does not leave anyone behind.
- We will provide additional services and support through our colleagues or via partnerships, with multiple services applied to one household if applicable.
- We will continue to fund first time gas connections via our Fuel Poor Network Extension Scheme (FPNES), delivering at least 2,500 new connections in GD2.
- We have mapped our services to deliver against the key five themes in Ofgem's Consumer Vulnerability Strategy 2025.
- We're the first GDN to receive whole business accreditation against BS 18477 for Inclusive Service Provision. We commit to maintaining this.
- We'll invest £750k a year to identify and support vulnerable customers and reduce the risks of carbon monoxide (CO). This will be funded by a 'use it or lose it' allowance with 25% ring fenced for GDN collaborative projects.
- We will invest £1m on NIA innovation projects for vulnerable customers in GD2.

CVP

We have valued our 'use it or lose it' services with a CVP net benefit of over £70m in GD2.

At a glance: Investing in social obligations

Investing in social obligations

2018/19 Prices (£m)	GD1 Per year	GD2 Per year	GD2 total
Provision of alternative heating/cooking	0.24	0.29	1.45
Vulnerable customer services	0.28	0.37	1.85
CO and gas safety	0.23	0.19	0.95
Collaborative GDN projects	0.03	0.19	0.95
FPNES	2.30	1.64	8.20
Total	**3.08**	**2.68**	**13.4**

2. Introduction

We work in around 100,000 homes and communities each year across our network and are well placed to help identify and safeguard consumers in vulnerable situations.

Vulnerability comes in all different forms; it may be physical, mental, emotional, geographical or financial. For some, it is a permanent state but for others it may be a transient one.

Our stakeholder research has shown how we can affect our customers and we will do everything we can to mitigate this, providing additional services whenever possible.

We know that an ageing population and growing numbers of dementia, diabetes and mental health cases means we will be dealing with increasing numbers of people living in vulnerable situations in GD2.

We also expect the requirement for tailored services to increase due to a greater demand for communications in Welsh and other languages.

As a responsible business, we are committed to a sustainable approach going forward and making sure we play a positive role in and amongst the communities we serve. Colleagues go above and beyond to provide customer service excellence for everyone, whatever their circumstances, and they understand how important it is to make sure that those customers who require additional support have their voices heard.

In this chapter, we explain how, informed by our stakeholders and driven by our Consumer Vulnerability Strategy, we will safeguard people during our works. We also describe the additional services we can offer, either directly or through strategic partnerships which provide a real financial and health benefit for many years.

3. Our GD1 performance

Safeguarding customers and delivering value added services is nothing new for WWU. We have:

- provided alternative heating and cooking to 50,000 homes, completed 500 free service alterations, referred 18,000 to the PSR, helped over 2,200 homes to tackle fuel poverty through maximising income and accessing energy efficiency measures, provided 25,000 free CO alarms.

Innovation for customers has been high on the agenda during GD1. We have:

- Introduced Keep warm packs, heated seat covers and LCVs.
- Used data mapping to identify off gas fuel poor households and overlay vulnerability data to allow targeting of homes and communities by our partners.
- Developed FRESH vulnerability mapping with Warm Wales and the University of Cardiff, allowing us to overlay complex data on poor health and income to identify areas of housing that may require support. The CAB recognised FRESH in their local authority guide to tackling fuel poverty and BEIS referred to it as best practice.
- Introduced SignVideo and Language Line services for customers.
- Investigated the safeguarding of customers at streetworks (ongoing).

Chapter 7. Social obligations (continued)

4. Vulnerable customer strategy

In GD1, we worked with Sia Partners to develop our Consumer Vulnerability Strategy – in parallel with our Stakeholder Engagement and Customer Service strategies – to deliver real outcomes for customers living in vulnerable situations.

This strategy – which we describe in more detail at the start of Part B – sets out our ongoing mission to support customers living in vulnerable situations and outlines the practical steps that will be taken to enable us to achieve our objective. Our strategy and services are aligned to Ofgem's Consumer Vulnerability Strategy 2025 and we are proud of the contribution our services are making to customers across the five key themes.

A significant part of delivering our strategy is the successful identification of those who need extra support. In GD1, we have been identifying those living in a vulnerable situation by:

- **Accessing existing suppliers'** Priority Service Register (PRS) via a secure xoserve portal.
- **Training customer facing colleagues** to identify and sensitively manage priority customers, including those not registered on the PSR.
- **Tapping into Local Authority Resilience teams** in the event of a major incident.
- **Combining services with our partners** We work with partners who have access to hard to reach vulnerable homes, are trusted, and have good geographical coverage and access to funding.

Consumer Vulnerability

- **We will formalise existing and create new partnerships in GD2 under a new LO proposed by Ofgem.** Our partnership evaluation tools enable us to identify and evaluate potential organisations before we commit to entering into a partnership with them and then to set measurable SLAs to monitor and value the partnership.
- **We are also working with other utilities to ensure PSR data is shared effectively and quickly.** We are currently building a programme of work with Welsh Water and are part of the Welsh Government Jigso project looking to link up priority customer data across multiple sectors. We will apply this learning to other organisations across the south west of England in GD2.

- PSR customers are recorded against one or more of 35 Needs Codes that are common to the gas and electric sectors. However, with 500k[1] (21%) of the 2.4 million households with a gas connection in our area on the PSR, we further prioritise that data to ensure we target those most in need first. The three priority groups are those living with a serious physical health condition, those with physical impairments and those with mental health conditions.

Click **Appendix 7A** for our Consumer vulnerability strategy.

Click **Appendix 7B** for our strategy mapped to Ofgem's Consumer Vulnerability Strategy 2025.

1 Research shows this figure could be as high as 40%

In GD1, we have evolved our awareness programme to make sure we can deliver improved outcomes for those most at risk from CO.

Measuring social return on investment (SROI)

Working with external partners allows us to understand what benefits society based on cost.

We make sure that all our activities provide either a net financial or social benefit – or both.

Everything we do provides either a net direct financial benefit or an SROI, which we measure via our cost benefit analysis (CBA) tool.

Created with Sia Partners, our SROI tool incorporates both traditional CBA and valuation of the social impacts using the HM Treasury Green Book methodology.

Combining these two approaches allows us to demonstrate the total economic value, including both the financial and social impact, of a project, making sure we meet an individual's needs. We can then decide whether to deliver the service directly or via a third party.

Click **Appendix 7C** for an overview of the methodology used in the models supporting the investments laid out in this chapter.

Chapter 7. Social obligations (continued)

5. Overview – customer and stakeholder feedback

Working with others to identify customers' needs and also to identify and support hard to reach, vulnerable customers.

In-depth customer focus groups and one to ones with customers living in vulnerable situations – alongside conversations with partners and representative organisations such as Hijinx theatre and BAME organisations – have helped us to better understand the sheer breadth and complexity of consumer vulnerability.

The CEG challenged us on the numbers of people we have engaged with, however, our research has had to be qualitative, rather than quantitative, due to the complex nature of the topics. They also challenged that our partnership approach was not strategic enough and we were not clearly demonstrating the outcomes we wanted for vulnerable customers. In direct response to this, we have produced a Consumer Vulnerability Strategy and developed a new partnership evaluation tool.

Click **Appendix 7A** for our vulnerability strategy.
Click **Appendix 7D** for our Partnership tool.

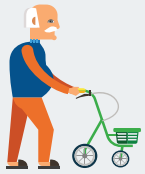
Our consumer vulnerability research highlighted the impact of even a short interruption on customers in vulnerable situations. Our engagement revealed that in general, vulnerable individuals and their carers do not know about the support available to them, but are impressed at the assistance WWU provides. Many customers believe that priority groups within the broader 'vulnerable customer' category must be identified; for example, emotional vulnerability is often linked to other more visible vulnerabilities.

Engagement informing our commitments

Continue our leading work in data sharing agreements, with the aim of aligning the gas, water and electricity sectors into a virtual common PSR – while working towards a single PSR for all utilities in GD3.

Our consumer vulnerability engagement programme demonstrated the lack of knowledge around the PSR and the various types of vulnerabilities that exist. Based on 10 engagement events in total, including 3,362 stakeholders, there was strong support for sharing data and information between utilities and third parties to avoid multiple sign-ups to different registers. SMEs are more willing than domestic customers to pay for increased partnerships across the utilities. Stakeholders also believe that WWU should work towards a common PSR with shared access. Our CFP suggested that suppliers work together to share PSR data, as well as smart meter data.

This commitment was reinforced in 2016 at two cross utility Stronger Together Conferences for gas, electric and water utilities that we co-hosted. These conferences identified a desire to collaborate; sharing data on PSRs and working jointly in communities impacted by our works. This feedback has led us to make a firm commitment in this area.



Stakeholders support our proposal to create a Community Project fund to expand the reach of services and key messages to priority customers.

Work alongside partners and carer networks to increase the number of PSR sign-ups by 200% compared to 2018/19.

Respondents to our vulnerability interviews were surprised that utilities and suppliers were not already working together to raise awareness of the PSR and increase sign-ups and wanted us to work harder to collaborate. Stakeholders asked us to do more to identify those harder to reach people. In our July plan, we committed to increase PSR sign-ups by 150%, however following additional insight, we decided to adjust this commitment to 200% (12,000 per year). Domestic customers are more willing than SMEs to pay for support to those considered vulnerable. However, acceptability testing carried out in June 2019 revealed that only 28% of those surveyed would be willing to pay more on their bill to fund this, so we have taken this into consideration when adjusting our commitment.

Further support vulnerable and fuel poor customers by investing £750,000 a year in wide ranging initiatives with partners and increasing CO support measures, almost doubling our GD1 investment.

This commitment is endorsed by over 20,000 stakeholders, however there was some conflict around how much of a role we should play in supporting fuel poor customers. Whilst our input is seen as admirable, stakeholders felt we should be working alongside partners outside the gas network to deliver. As a result, we have amended our commitment.

Expert vulnerability stakeholders such as National Energy Action (NEA), want to see the FPNES continue into GD2, with funding going to those homes most in need. Local authorities want the FPNES to continue as it provides key funding to support local initiatives such as Warm up Bristol, Warm and Well Cornwall and the Welsh Government NEST and Arbed projects. The CEG and the RIIO-2 challenge group both challenged why our GD2 FPNES ambition is lower than it was in GD1. We explained to them how our engagement with partners and central heating system funding providers has led to this forecast. We will continue to review this on a regular basis and are committed to undertaking additional connections if funding is available for more heating systems.

Stakeholders support increased awareness of the dangers of CO. Policy Connect wants GDNs to remain engaged with the All Party Parliamentary Committee on CO, to influence policy and raise awareness. Some stakeholders believe that our involvement with the distribution of CO alarms is not necessary, whilst others would like us to give every home a free CO monitor. At Regional workshops and our CFP stakeholders advised us to establish formal partnerships with selected third parties to help deliver our services and provide referrals This would create mutual benefits and cost efficiencies.

Stakeholders support our proposal to create a Community Project fund to expand the reach of services and key messages to priority customers. The CEG challenged us to look at best practice elsewhere before developing our Fund, we since had discussion with UKPN and NGN are now learning from others.

Click **Appendix 5F** for further information on our engagement.

Chapter 7. Social obligations (continued)

6. Summary of our GD2 outputs

Customer service outputs — Click **Appendix 3A** for further justification on these outputs

Measure and type	Explanation	Proposal/target	Stakeholder views	18/19 performance	Comparative performance	Other requirements	Customer benefits
Common output measures with a common target							
Consumer vulnerability minimum standards LO	A new LO to identify vulnerable consumers and provide support including partnership working.	We will identify customers, provide a range of services and expand our partnerships.	Stakeholders support the focus and services for vulnerable customers including our partnership working but ensuring we don't duplicate the work of others.	Met LO £0.4m reward at SEIS panel.	Comparable performance amongst GDNs but behind some DNOs, particularly on SEIS.	Further work needed to define requirements for this output with Ofgem in 2020.	Customers in vulnerable situations will be proactively identified and supported before, during and after our works.
Consumer Vulnerability Reputational Incentive ODI R	A new reputational ODI to annually report on the support given to vulnerable customers and host an annual joint GDN showcase event.	We will produce an annual report inc some common GDN metrics to be agreed. We plan to hold a series of annual regional stakeholder showcase events.	Stakeholders support the focus on vulnerable customers during our works and the additional services we offer.	New requirement.	New requirement.	Further work needed to define requirements for this output with Ofgem in 2020 inc the three or four key GDN metrics and how the annual report will be assessed.	The annual report will provide transparency and the annual showcase events will allow smaller local groups as well as larger organisations to help us develop services and partnerships.
Common output measures with bespoke targets							
Consumer vulnerability and CO safety 'use it or lose it' allowance PCD	A 'use it or lose it' allowance to support vulnerable customers and raise CO awareness.	A programme of works based on an annual fund of £750k with 25% ring fenced to collaborative GDN projects.	Overwhelming support and acceptance from customers following extensive engagement albeit with some conflicts of opinion in terms of our role in CO.	New output.	Comparable with the other GDNs. Recognition at DRS for work with health sector.	The GDNs have set up a new group from Jan 2020 working with key stakeholders from across the gas industry and charity sector to create the process and projects for GD2.	Customers will benefit financially through increased household income, lower tariffs, energy efficiency measures as well as warmer and drier homes leading to social benefits.
FPNES PCD	Funding of first time gas connections to eligible fuel poor homes.	A total of 2,500 connections (£8.2m) to fuel poor homes in GD2 – 700 per year in 2021/22 reducing to 300 in 2025/26.	Customers support the FPNES where gas is the best option. CEG & RIIO-2 CG want more ambition but accept our caution given the lack of visibility of funding for central heating systems.	1,083 connections.	On target in GD1 along with SGN Scotland and NGN. Unlike SGN Southern and Cadent who are at risk of missing their target.	Ambition limited by third party funding for first time central heating systems and Ofgem require partners to demonstrate gas is best option before FPNES funding given.	Homes that receive a connection will save on average £680 a year on heating bills and improvements to health and wellbeing delivering wider societal benefits as measured by our SROI tool.
Bespoke output measures							
British Standard for Inclusive Service Provision – BS 18477 ODI R	Reputational ODI to deliver best practice as measured by BSI accreditation across our whole business.	Maintain standard through annual audit process.	The BS 18477 standard is seen as best practice, recommended by Ofgem and endorsed by our customers and stakeholders.	BS 18477 accreditation.	Leading – first GDN to receive accreditation. NGN and SGN recently accredited. National benchmark standard.	The annual audit ensures our employees are trained and delivering services business-wide, and are adapting to any new statutory requirements.	Vulnerable customers will be provided with improved service levels which are bespoke and best practice. We will return the £15k (<1p per customer) annual costs to customers if we lose the accreditation.

Chapter 7. Social obligations (continued)

Innovation in GD2 for vulnerable customers

We have identified £1m of spend on NIA (Network Innovation Allowance) funding for vulnerable customers in GD2. Key themes of projects as agreed with stakeholders will be:

1) Use of data sets to better identify vulnerable customers combined with analytics to drive effective and targeted programmes of work. We envisage this work will allow us to:

- identify vulnerable, low income households for fuel poverty and energy efficiency programmes;
- identify homes at most risk of CO incidents and target awareness and free alarms.

2) Development of technology to reduce interruptions numbers and duration, and to provide further support to customers; eg provision of hot water for cooking, hot drinks and bathing and improved forms of temporary heating which is particularly important if the interruption is protracted.

3) Studies and trials of sensors linked to appliances for customer safety and energy efficiency in the home. We need to do further work in this area to scope projects and these may be joint GDN projects.Examples might be new CO monitors and gas detectors linked to shut off devices on the meter or appliances. We will also work with partners on developing smart controls to drive energy efficiency following up our hybrid heating work in GD1 with PassivSystems.

7. Consumer vulnerability incentive

Working towards a future where all customers' needs are met, ensuring no one is left behind.

We will produce an annual report to support the Customer Vulnerability Incentive Licence Obligation. The report will set out:

- how we identify and safeguard customers during our works;
- our social obligations work and outcomes for customers;
- our response to the annual stakeholder engagement incentive.

The report will include how our partnerships help us to identify and support homes, and how we have evaluated the social return on investment. It will also refer to how we have met our LOs and GSoPs, and utilised the 'use it or lose it' allowances.

We will work with Ofgem and the other GDNs to develop a small number of key metrics for the report and how the report can mirror Ofgem's Consumer Vulnerability Strategy 2025 key themes.

As per the proposed new LO, we will run three to four annual showcase events across our network. We will invite local stakeholders to discuss what we have achieved and how we can improve outcomes for those living in vulnerable situations.

The additional services we offer to customers in vulnerable situations

- Maximising income
- Tackling energy and water debt
- Energy efficiency advice
- Sign-ups to the Priority Services Register
- Tariff advice and switching
- Accessing energy efficiency measures
- CO awareness and alarms
- Locking cooker valves

8. Safeguarding customers during works in GD2

In GD2, we will focus on the following seven areas to make sure we are best placed to safeguard our customers, whatever their situation.

- Planned interruptions
- Unplanned interruptions
- Dealing with large incidents
- Connections
- FPNES
- Fuel poor connection targets
- 'Use it or lose it' allowance.

Planned interruptions

Our mains replacement and associated service work will impact around 34,000 customers each year in GD2. With 21% of customers being on the PSR, we estimate that over 7,000 vulnerable customers will be impacted each year.

We will ensure everyone on the PSR is identified and the works programmed to minimise impact.

Customers will receive a written communication from us at least seven days before the interruption, followed by a visit from a CSO. They will identify and agree any specific actions for that home, and communicate this to the team leader.

Through training and contracts we will ensure all customers are treated equally, whether served by our own engineers or contractors.

This might include:

- regular updates via preferred communication method;
- alternative heating and cooking;
- keep warm packs seat covers;
- prioritised reconnections/2-hour appointments;
- voluntary payments for extended interruptions and enhanced GSoP payments.

Unplanned interruptions

Responding to emergency calls to ensure the health, safety and wellbeing of the general public is a priority.

We forecast that 8,000 customers may experience an unplanned interruption to their supply each year in GD2.

We are committed to identifying PSR customers via our IT systems and providing support on site. The range of services will be as laid out above for a planned interruption.

Our engineers have been provided with language translation and British Sign Language Apps to aid communication and we will also make sure that every customer receives a written explanation outlining the situation and next steps.

Our social obligations team will provide additional support if we need to shut off a vulnerable customer's supply and ensure they are back on gas as soon as possible. We will help them contact landlords and source funding for repairs and broken boilers and use our Hardship fund where required, to ensure no one is left in a cold home.

Dealing with large incidents

If/when a large incident does occur, we commit to the following actions:

- Resourcing the incident appropriately, seeking support from local contractors and other GDNs where required.
- Setting up an incident room and customer contact centre on site and utilising our customer support vehicle.
- Deploying our incident app to engineers, allowing us to segment the area and prioritise the most vulnerable.
- Providing specialist customer support on site via our CSOs and via our office-based Customer Service team.
- Offer and provide alternative heating and cooking.
- Arrange hot food catering and provide food vouchers, and ad hoc financial support.
- Where required, seek support from Local Resilience forums via the local authority.
- Promptly pay any GSoP payments due.

The smart meter roll-out is expected to reduce our ability to provide a temporary meter, as we currently do for suppliers under PEMs contracts.

Customers worry about the costs of using the alternative heating and cooking we provide, so we will provide a £10 fuel voucher to each household in GD2.

£50k

We have included an extra £50k for alternative heating and cooking for when gas suppliers are interrupted.

Connections

In the case of a new gas connection, the customer will not have a gas supply contract in place and will therefore not appear on the suppliers' PSR. Our staff have been trained to identify vulnerability and will record any agreed actions to be taken on site so that our engineers are informed when they arrive on site to deliver the work.

We will ensure that communications with the customer are in a format and channel that best suits them. On site, we will ensure that customers have regular communication either face to face or by text on the progress of their job.

Working with our partners, we will clearly communicate the funding we can provide from our Fuel Poor scheme and help the customer to identify sources of third party funding for the boiler and heating system.

In the case of service alterations, we can identify customers on the PSR. We will offer funded alterations to the gas supply in line with our LOs and will ensure that any customer who meets the criteria, whether on the PSR or not, is treated the same.

Chapter 7. Social obligations (continued)

9. FPNES

Ensuring all households have access to affordable energy, doing our best to bring customers out of fuel poverty.

Making sure that all households have access to affordable energy is a key priority. The FPNES provides eligible households with funding towards a new gas service.

We are not able to fund the heating system and must therefore work with partners to link up the funding streams to deliver a joined-up service. We have taken a proactive approach to this in GD1, along with our main fuel poor partners Warm Wales and Flintshire Council. We have supported bids for funding and then worked to develop efficient processes and delivery of works to ensure we hit our targets.

The NEA UK fuel poverty monitor report 2018 shows that 11% of homes in England are in fuel poverty. This is higher in some areas, particularly where there is limited access to the gas network.

For example, in Cornwall, only 60% of homes are connected to the gas network. This, combined with low average incomes, results in almost 15% of homes being in fuel poverty. In Wales, a newly published 2018 fuel poor report[2] shows 12% of homes are in fuel poverty.

As part of our innovation project REACH, we have developed tools to identify those properties which are not on gas, are economical to connect, and who display characteristics of being in fuel poverty.

We will look to collaborate with organisations funded to identify vulnerable customers and tackle fuel poverty. Our GD1 fuel connection target was increased from 10,800 to 12,590. Significant changes made to the eligibility of the scheme following our reforecast have made achievement of this target very challenging.

Fuel poor connection targets in GD2

Analysis has shown that we have around 90,000 homes in our network that would be economical to connect. Based upon fuel poor statistics, this equates to around 10,000 homes that could be eligible for the scheme. Our ambition would be to connect all of these homes if the customers so wished. However, we are limited by customer choice, and also funding for new heating systems, and a recognition gas is not always the best option for a household.

The following table shows the current funding streams and how these change or stop during GD2.

In GD2, we commit to:

- at least 2,500 FPNES connections;
- using our SROI tool to demonstrate household savings (c. £680 per year) and social benefits of the scheme;
- ensuring all customers are provided with available funding and advice on tariffs and energy efficiency.

Funding streams

Scheme or source of funding	New gas heating systems forecast for 2019	End date of funding	Forecast heating systems forecast in 2021	Forecast heating systems forecast in 2025
Welsh Government NEST	150	2022	100	0
Welsh Government Arbed	600	2022	300	0
ECO 3	None directly	2021	50	0
National Grid Warm Homes Fund	500	2021	0	0
Social landlords	100	Ongoing	100	50
Private landlords	100	Ongoing	100	150
Local authorities/Direct Funding from household	100	Ongoing	50	100
Total	**1,550**		**700**	**300**

A realistic view of the workload is therefore as follows, and we are asking for funding for this volume of connections.

► Forecast workload

Year	2021	2022	2023	2024	2025	Total
Wales	400	300	300	200	200	1,400
South West of England	300	300	200	200	100	1,100
FPNES total connections	**700**	**600**	**500**	**400**	**300**	**2,500**

2018/19 prices

	GD2 (£) per year	GD2 total	Customer benefit (£)	Social return on Investment
FPNES costs	£1.6m	£8.2m	£5.8m	£4.3m

Chapter 7. Social obligations (continued)

Ofgem have stated they will put in place a reopener which will retain the flexibility to stop the FPNES in response to development in government heat policy.

We wish to see this extended so a re-opener would allow us to reforecast numbers and obtain funding in response to a significant change in government policy in England or Wales, which supported major investment in gas connections and extension of the gas network (such as a national infrastructure project for energy efficiency or decarbonisation).

Going forward, we will continue to provide support to 'on gas' homes in fuel poverty and to use the 'use it or lose it' allowance described over the next pages to support this work.

We are already working with organisations to take a more holistic view of rural off gas areas. Opportunities to use farm waste (to create biomethane which could serve a local pipe network) do exist, although the challenge of seasonal demand needs to be addressed.

We are also promoting the concept of hybrid heating systems as a solution to reduce the costs of homes that are on LPG or oil heating systems. Case studies have shown savings of 50% on energy bills are achievable by combining a heat pump and controls with the existing heating system.

We have already seen some supplier-led schemes for hybrid heating systems and controls, and we will signpost customers who are off gas/use LPG and oil systems to these schemes.

10. 'Use it or lose it' allowance strategy CVP

Ofgem has proposed a new GD2 'use it or lose it' allowance output to provide additional support to vulnerable customers. This forms part of our CVP. We will be building upon GD1 programmes of work, increasing the level of our ambition. The services will be delivered via:

- follow-up services to customers who have been impacted by our works at that property in their community;
- working with partners to identify vulnerable homes and communities, finding the most hard to reach, vulnerable people.

Stakeholders want us to invest even more in this area. We will review opportunities as they arise with a view to adding additional funding into schemes which demonstrate real value for the customer and/or society, either directly or through partnerships. 61% of stakeholders support the PSR, but this is far higher for vulnerable customers and their carers.

25% of the £30m 'use it or lose it' allowance will be ringfenced for work with the other GDNs. This equates to £7.5m during GD2 or £1.5m per year. This is a large sum of money compared to the collaborative work done in GD2 and will require us to work with national stakeholders to create projects that are both ambitious and far-reaching.

We have already met as a group of networks to agree a structure for future coordination of this funding and the sub groups that will support the initiatives that will commence in January 2020.

Priority Service Register (PSR) CVP

Understanding our customers allows us to take adequate steps to look after the most vulnerable.

We will use part of the funding to raise awareness of the PSR, providing multi-channel options to sign up customers and to refer these sign-ups to suppliers, electricity network operators and water companies.

Proposed vulnerable customer services for GD2

Service	Volumes P.A.	Annual investment	GD2 investment	Net CVP
PSR sign up	12,000	£0.05m	£0.25m	£60.0m
Hardship fund	200 cases	£0.04m	£0.2m	–
Locking Cooker Valves	100	£0.01m	£0.05m	–
Fuel Poverty and Energy Efficiency	1,200 homes helped	£0.22m	£1.1m	£12.5m
Community Project Fund		£0.05m	£0.25m	£2.7m
Total		**£0.37m**	**£1.85m**	**£75.2m**

Our investment in CO in GD2

Service	Volumes P.A.	Annual investment	GD2 investment	Net CVP
Promote CO messages (homes)	250,000	£0.015m	£0.0750m	
CO monitors and awareness	5,000	£0.075m	£0.0375m	
Awareness only including measurement of understanding	5,000	£0.050m	£0.0250m	
Schools events and support for GDN school competition	50	£0.050m	£0.0250m	
Total		**£0.0190m**	**£0.0950m**	**£1.000m**

Chapter 7. Social obligations (continued)

We will also work alongside the other GDNs and seek support from other utility companies to work with the energy and water regulators to create a single cross utility PSR by the end of GD2.

Our commitment

Continue our leading work in data sharing agreements, with the aim of aligning the gas, water and electricity sectors into a virtual common PSR – while working towards a single PSR for all utilities in GD3.

We have trained our colleagues and partners to sign customers up to the PSR via apps, forms and websites. We will also use social media campaigns to reach targeted priority groups. In GD1 we have signed up 12,000 homes over a 4-year period from 2014 to 2018. A social media trail in 2019 has opened our eyes to the power of social media and the cost efficiency of their channel. We are forecasting 10,000 sign-ups in 2019.

In GD2 we are committing to at least 12,000 sign-ups per year.

These customers will be added to the gas, electric and water PSRs and will receive a range of support services as well as financial benefits. Based on the number of customers receiving these benefits, we calculate the CVP as having a net value of £60m.

Our commitment

Work alongside partners and carer networks to increase the number of PSR sign-ups by 200% compared to 2018/19 to 12,000 per year.

Locking Cooker Valves (LCVs)

LCVs reduce the chance of a gas related incident by allowing a carer to lock/unlock the supply to a gas cooker. This service is delivered in-house by our engineers and was developed with third parties and through collaborative work with other GDNs. Our stakeholders support the installation of LCVs, with 63% of the consumer vulnerability research participants considering our provision of them to be essential. Feedback highlighted that LCVs could also be useful for parents with small children. We will continue to promote this service to health professionals and landlords with a forecast of 100 installations per year in GD2.

Hardship fund

Helping to support customers that are in fuel poverty, providing advice and financial assistance.

We commit to ensuring no customer is left in a cold home. Where a customer requires our support following a gas escape we will work with partners to access funding to repair and replace broken boilers and appliances. Our Hardship fund will allow us to contribute towards the costs, or fund in full where necessary.

We will allocate £40k a year into a Hardship fund using any unused money for other initiatives.

CVP

For every £1 invested in the PSR, there will be £270 of net value to customers.

Fuel poverty and energy efficiency

Working with partners to make sure all customers have access to affordable heating.

Whilst the FPNES provides funding for first-time gas connections to homes, we recognise that fuel poverty also impacts those already connected to our network, as well as off gas homes in towns and rural areas.

Under our Healthy Homes Healthy People project with Warm Wales we are working with local authorities and health professionals to identify vulnerable homes.

We then visit the home and assess the person and the property. Services we can offer include:

- maximising income through unclaimed benefits;
- tackling energy and water debt;
- tariff advice and switching;
- accessing energy efficiency measures;
- energy efficiency advice;
- sign-ups to the PSR;
- CO awareness and alarms;
- locking cooker valves (LCV).

In 2018, we helped 1,239 homes access savings and measures worth £886k for an investment of £223k. This project was acknowledged and rewarded at the 2018 DRS panel with a reward of £150k.

Click **Appendix 7E** for our Healthy Homes, Healthy People case study.

We are committing to help at least 1,200 homes per year to achieve average savings of £650 per household during GD2 with delivery across our geography.

CVP

For every £1 invested in fuel poverty and energy efficiency, there will be £12 of net value to customers.

Community Project Fund CVP

The 'use it or lose it' allowance provides us with a mechanism to support community-based projects in GD2. This proposal – based on a similar scheme run by NGN in 2018 and a larger UKPN scheme – has been tested at regional workshops and is supported by 86% of the 50 organisations that attended. We will work with stakeholders to create the detail of the scheme and to assess fund applications. Applicants will need to show the expected impact of their projects and how they will acquire additional funding and volunteers.

We propose £50k is made available each year for community groups, charities, social enterprises, not for profit companies and councils. Communities will be able to apply for grants between £1k – £10k to deliver energy-related services for vulnerable customers. This forms part of our CVP.

Chapter 7. Social obligations (continued)

Carbon monoxide (CO)

Increasing awareness of the dangers of CO within schools and communities, making sure we target those who are most vulnerable.

In the UK, CO poisoning in the home accounts for an average of 50 recorded deaths a year and up to 4,000 medical visits.

Most deaths occur when people are camping, boating or in commercial properties. Despite a low number of deaths being due to domestic appliances each year, we continue to work with Policy Connect and APPCOG, providing alarms and advice to those most in need.

In GD2, we commit to reaching 250,000 homes each year with CO awareness messages, partly through our works, but also through partners and organisations such as the landlord's registration agencies. Each year, 10,000 homes will be engaged face to face by our staff and partners.

We expect to issue 5,000 free CO alarms to the most vulnerable homes. These will be people we engage with on fuel poverty and energy efficiency. Evidence shows that people on low incomes and in vulnerable situations are more likely to not service their appliances and dangerously heat their home with appliances intended for camping or outdoor use. We will measure their understanding of CO before and after our engagement.

We also commit to expanding our schools programme in GD2, targeting at least 50 schools and 4,000 pupils per year. This programme includes Safety Seymour training sessions delivered by our Gas Ambassadors to KS1 and KS2 children.

We have run a schools CO awareness competition with other GDNs during GD1. At the new GDN working groups, we will be looking to refresh this idea and seeking opportunities to run a nationwide campaign to engage with future energy users via schools and colleges.

We are also in the process of developing materials for older pupils/university students and are looking for opportunities to create sessions that cover gas safety, energy efficiency and how to decarbonise the UK energy system.

This work forms part of our CVP, valued at £1m across GD2 and GD3 – and is based on the avoided costs to the health service and society in order to deal with the impact of CO exposure (from GP visits to avoided deaths).

Our commitment

Further support vulnerable and fuel poor customers by investing £750,000 a year in wide ranging initiatives with partners and increasing CO support measures, almost doubling our GD1 investment.

CVP

For every £1 invested in CO awareness and CO monitors, there is a net £1.20 in societal value.

Caerphilly girl, 7, saves family from CO poisoning

Jaydee-Lee Dummett, of Caerphilly, recognised the deadly signs of CO poisoning when her four-year-old brother awoke disorientated in the night.

She remembered the gas emergency phone number after spotting the detector alarm had turned from green to red. Jaydee-Lee had recently attended a Safety Seymour gas safety session delivered at her school by three WWU Gas Safety Ambassadors.

Her quick thinking has been praised by engineers and Sean Ward, a WWU emergency engineer, said: 'The actions of Jaydee-Lee have saved her family's lives. Jaydee-Lee's school, Fochriw Primary, said she had become a 'role-model' for other pupils.

Jaydee-Lee was recognised at the Pride of Britain awards 2019 with a Child of Courage award https://www.prideofbritain.com/component/k2/jaydee-lee

Conclusion

We take our social responsibility very seriously and want to make sure we continue to have a positive impact on the communities we serve. Our stakeholders have reviewed the services we have offered in GD1 and support the services into GD2 and beyond.

We will continue to work alongside our existing and new partners to develop additional tools to help us better identify those who need our support most. We will also be more robust in evaluating the impact of our services on homes and society, and will refine our range of service and the delivery year on year.

Because of conclusive stakeholder feedback, our primary focus will be on raising the profile of the PSR and encouraging customers to sign up.

We will tackle fuel poverty by continuing to provide funded gas connections through the FPNES. We will tackle wider fuel poverty by addressing household income and energy costs of existing gas users and those close to the gas network.

We will continue to promote the dangers of CO, but focused on the most vulnerable and at risk in society; doubling our provision of free issue CO monitors.

We will also focus our business volunteering activities on improving communities and the lives of vulnerable customers, with a business commitment to matchfund and allow colleagues time during working hours to participate in projects.

C

Delivering value for money

This section of our business plan sets out the ways in which we will provide an efficiently priced energy solution to meet our customers' needs.

We do this by keeping our component of customers' bills as low as possible and by using competition and innovation to drive efficiency across the business. We also set out how uncertainty should be dealt with.

In this section:

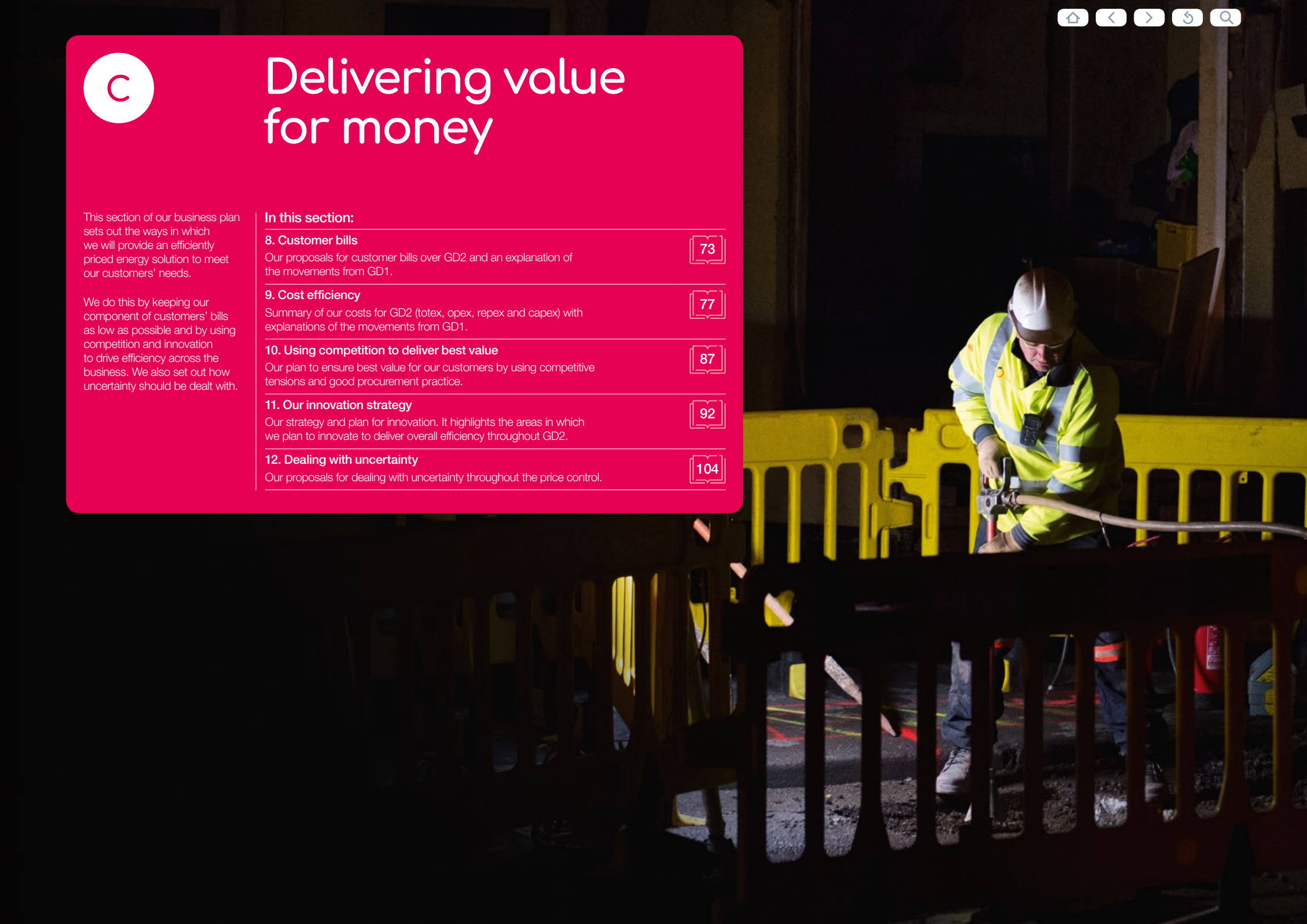
8. Customer bills 73
Our proposals for customer bills over GD2 and an explanation of the movements from GD1.

9. Cost efficiency 77
Summary of our costs for GD2 (totex, opex, repex and capex) with explanations of the movements from GD1.

10. Using competition to deliver best value 87
Our plan to ensure best value for our customers by using competitive tensions and good procurement practice.

11. Our innovation strategy 92
Our strategy and plan for innovation. It highlights the areas in which we plan to innovate to deliver overall efficiency throughout GD2.

12. Dealing with uncertainty 104
Our proposals for dealing with uncertainty throughout the price control.



Chapter 8. Customer bills

1. Highlights

- Our eight-year average GD1 charge per domestic customer is £133[1]; one of the lowest across all gas networks.
- As a result of our efficient delivery, we will have returned £72m to shippers through lower charges in GD1 that should be passed on to customers. Customers will also receive a further £81m benefit over future control periods as a result of our performance during this price control.
- During GD1 our owners have subsidised charges by around £10 a year of the average bill, because efficiently incurred debt costs were not fully funded. This is not sustainable and needs to be properly addressed for GD2.
- If this £10 were included our GD1 average charge would be £143 – still placing us well within the range of gas distribution networks.
- We will keep our charges as low as possible in GD2, while ensuring that we continue to operate a safe and reliable network.
- At £133 the forecast average charge in GD2 is flat compared with our current level, and is lower than the fully funded charge of £143.

2. Introduction

Our commitment

Keep network charges down to the lowest practical level, maintaining the average GD1 household bill of £133 a year into GD2.

As a regulated gas network we do not bill customers directly. Our charges for running the gas network are charged to customers via their supplier and are paid for through the customer's energy bill. Our charges typically make up around 20% of the total gas bill. We are committed to keeping our proportion of the bill as low as possible.

A number of elements make up these charges:

- Our operating expenditure, known as 'fast money' and is recovered on an annual basis.
- Our capital expenditure, known as 'slow money' and is paid for by customers over 45 years.
- Non-controllable items, which include licence fees, formula rates, pensions, National Transmission System (NTS) charges and shrinkage.
- The costs of financing our business, including the cost of capital.

This chapter provides insights into:

- the building blocks that make up our network charges and the movements between GD1 and GD2;
- The views of our customers and stakeholders about our charges;
- The factors that will impact on the future bill for current and new users of our network;
- The bill impact of NTS operator charges.

Customer bills for the GD2 period will be an outcome of the finalised Allowed Revenues at the end of this price control process. Ofgem will publish its final determinations in November/December 2020. The process does include an appeals mechanism. The GD2 period begins in April 2021.

3. Building blocks of our network charges

During GD1 our average charge has been £133 for a domestic customer. This is one of the lowest of all of the GDNs, based on a comparison of charges that we have referenced and which uses the information that is published by the GDNs.

The network charges that Ofgem publishes in its annual report, by contrast, are based on "an estimate" that uses a 12,000kWh average quantity of gas in order to ensure comparability with the retail bill publications. This analysis does not, however, show a true comparison of the charges for individual networks as recognised by Ofgem, which is why we use the GDN published data.

Our commitment to delivering value for money has been demonstrated through our totex outperformance, which is detailed in Chapter 4: Track record. This will result in £153m being handed back in lower charges.

We do not agree with the current Ofgem working assumptions for the cost of capital revenue allowances. This is covered in more detail in Chapter 22: Financeability. The current Ofgem cost of capital assumptions result in a c.£63m pa shortfall in revenues required to cover our efficiently incurred financing costs. The average domestic GD2 bill would be £114 using these assumptions.

Based on our business plan, we set out below a comparison of the building blocks of average domestic customer charges between GD1 and GD2.

It should be noted that all of the charges set out above exclude NTS charges, which are described later in this chapter. This approach is consistent with the comparisons that are currently provided by all of the GDNs through industry and regulatory reports.

Click **Appendix 8A** for a further explanation of the bill in response to CEG feedback.

GD1 average annual domestic customer charge

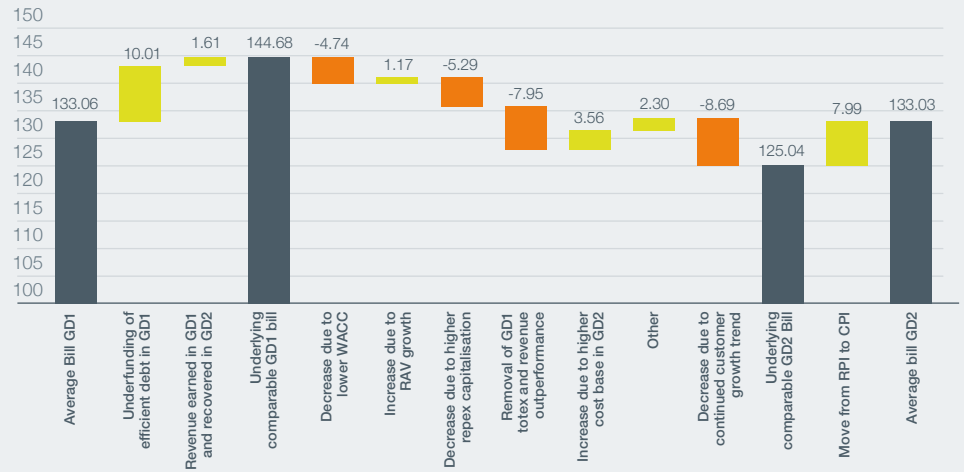
	GD1 average annual charge (£s)	GD1 debt costs added (£s)	GD2 average annual charge (£s)
Cost of debt	9.86	19.26	17.08
Cost of equity	16.47	16.47	13.68
Tax allowance	3.63	3.63	4.35
RAV depreciation	38.33	38.33	38.62
Non-controllable opex	19.98	19.98	22.66
Fast pot expenditure	42.08	42.08	29.91
Incentives	2.19	2.19	0.75
Other	0.52	0.52	-2.01
Total	**133.06**	**142.46**	**125.04**
Transition to CPI from RPI	0.00	0.00	7.99
Total after RPI to CPIH transition	**133.06**	**142.46**	**133.03**

1 All figures quoted in 18/19 prices unless otherwise stated.

Chapter 8. Customer bills (continued)

We explain the changes in charges through the following figure and accompanying narrative, which shows a full trace of bill movements between GD1 and GD2.

Waterfall of our charges between GD1 and GD2 (£)



Waterfall includes movement for customer growth trend which is allocated over totals in the table on the previous page.

GD1 charges

Our average charge for a domestic customer in GD1 is £133.06.

- The underfunding of our efficient debt cost during GD1 has been subsidised by our owners, which is not sustainable.
- There are some items that occur in GD1 which are funded in GD2 (as a result of the adjustments two years after they are earned).
- This provides an underlying GD1 charge of £144.68.

GD2 charges

In GD2 there are then structural adjustments comprising:

- assumed lower allowances for the cost of equity;
- offset by a higher return on capital from growing Regulatory Asset Value (RAV);
- In addition, mains replacement expenditure will all be treated as slow money in GD2, after transitioning from 50% to 100% slow money over the course of GD1.

We then adjust for:

- the handback of the totex incentive reward we earned in GD1 through outperforming our totex allowances;
- the increased totex costs we will incur in GD2 to ensure that we deliver our commitments;
- the impact of increased domestic customer numbers, lower gas volumes consumed by domestic customers, and increased non-domestic customers.

This provides a comparable GD2 charge of £125.04.

Finally, we adjust for the NPV neutrality adjustment, which reflects the forwarding of revenues from future price controls into GD2, to compensate for the estimated cost of the transition at the start of GD2 for the move from RPI to CPIH.

This results in a GD2 charge of £133.03.

At the headline level between GD1 and GD2 our bill has stayed flat, at £133. The bill based on the assumptions for the 'Ofgem Actual Company' would be £114.

Click **Chapter 22: Financeability** for further information. 194

However, the underlying comparable bill has reduced by almost £20 from £144.68 in GD1 to £125.04 in GD2. This ensures that we remain financeable and deliver on our commitments to our consumers, representing value for money.

£133

forecast average annual customer bill in GD2, broadly aligned with GD1.

4. Customer and stakeholder feedback

Working in partnership with others to better understand stakeholders' needs.

During 2018 and 2019, we held a series of 'value for money' exercises and workshops with our Critical Friends Panel (CFP), customers and stakeholders across the network.

Regional stakeholders were very much of the view that we deliver good value for money for the services we provide. When asked to vote on this the average score across all of the workshops was 8.6 out of 10.

A number of stakeholders were not actually aware of all of the services we deliver, or how much of the gas bill is related to those services. At the end of the workshops, when stakeholders were asked to reflect on value for money, there was overwhelming endorsement that current charges represent excellent value for money.

More recently, in July 2019, we held a 'deep dive' around the subject of value. Here customers expressed their views about financial risk and the areas where costs are increasing, including the mains replacement programme and cyber security.

Chapter 8. Customer bills (continued)

Customers also considered financial returns to our owners and debt costs. The overall view of customers who attended qualitative focus groups was that our forecast bill levels appeared to be fair.

This further testing, including informing participants about the regulations in place and how we make a profit, showed a higher acceptance of our charges. Stakeholders felt reassured that if they were paying more, the money would be put into investment and not into profit. They thought that we were doing a lot for the minimal proportion that we took from the customer bill. When comparing our consumer bills with those of other GDNs, stakeholders felt that they would accept a slight increase in the bill if it was in line with the market and justified in terms of the work done.

The acceptability testing of our initial plan revealed an overall acceptance of the bill commitment of 65% (one of the highest results); 27% would be willing to pay more if we could ensure delivery.

The CEG challenged us to better justify what is best for customers, with clearer links to fuel poverty and to our vulnerability strategy, and to the future of energy. In response we have developed our Consumer Value Proposition (CVP) which demonstrates the additional value that is delivered to different groups of customers. More information can be found in Chapter 2. The CVP has been reviewed by the CEG.

Our Willingness to Pay research in autumn 2019 concluded that after safety, the next area of priority for domestic and SME customers is keeping network charges down to the lowest practical level by maintaining the average bill at £133.

Overall, those who live in south west England and in urban areas are more likely to pay more for enhanced services compared with other groups.

Future customers (18-24) are also more likely to pay for enhanced services overall against the average, with particular monetary support for reliability, the transition to a green fleet, continuing with a risk-based approach and investing in innovation.

Based on 11 engagement events, including 3,441 stakeholders, there is overall support for maintaining our performance levels and keeping network charges as low as practical – at the same cost as in GD1. Based on this feedback, we are committing to maintaining the GD1 household bill at £133 average a year into GD2.

Click **Appendix 5F** for detailed information about our engagement.

5. Affordability and fuel poverty

Independent bodies such as the Energy Savings Trust and Which recognise that it is cheaper to heat homes by gas central heating than heating by electricity:

"The average annual cost for heating and hot water using electricity in the UK would be around £776 per year if you use 4,200 kWh of electricity and are on a standard single rate tariff. That is £200 more per year than gas heating." (Electric central heating 2019, Which).

We are committed to keeping customer bills as low as possible through GD2. The CEG challenged us to demonstrate how we have considered affordability, fuel poverty and the future of energy impacts on customer bills.

We will deliver on our commitment by:

- Continually looking for ways to improve the efficiency of the services we provide for customers and stakeholders.
- Excluding uncertain costs such as net zero spend from base totex requests. For example, we are proposing a new industry-wide uncertainty mechanism to be co-ordinated by Ofgem so that only fully justified investments are undertaken by all networks. This will avoid unnecessary cost stranding.
- Decision making with affordability as a key consideration. We cannot offer social tariffs/subsidies, but we use cost benefit analysis (CBAs) and our social return on investment (SROI) tool to evaluate cost decisions.
- Continuing to provide the Fuel Poverty scheme to lower the cost of connection for those who meet the eligibility criteria. Our partners also provide additional services to support those in most need, including efficiency measures advice, fuel switching support and access to the Priority Services Register (PSR).
- Ensuring that our innovation strategy continues to address fuel poverty and vulnerability and supports us in our ambition to find the lowest cost solutions for the different communities in our region. For example, we will continue the ground-breaking research that uncovered the benefits of hybrid heating (Project Freedom), which found that an off-grid property saved up to £700 a year in heating costs while providing a warmer home.
- Keeping our charging methodology under review so that every network user pays their fair share of charges. This is becoming more important as the use of our network evolves and supports more electricity generation and green gas injection.

6. Considerations impacting future charges

Considering how our network can be used in the future; delivering a green energy solution at a reasonable cost.

We are committed to ensuring that our bills are cost reflective for all users, and we engage with other gas networks, shippers and Ofgem to make sure this happens[2].

We engage on an ongoing basis with shippers, who operate in an evolving marketplace. We are pleased to act as the lead network in providing this key stakeholder with the information they need to help their charging to customers.

Citizens Advice has called on gas networks including ourselves to make 'voluntary contributions' back to consumers related to windfall gains. Their analysis is flawed and there are no windfall gains being received by our owners. The cash return to our owners is significantly less than the base allowed return for GD1. During GD1 our regulatory allowance for debt costs is lower than our actual efficiently incurred costs. Our regulatory licence defines our obligations and charges. We continue to deliver on our regulatory commitments, and to provide service and safety standards that position us as a top performer in our sector.

2 This is also a Gas Distribution Licence Obligation for all networks.

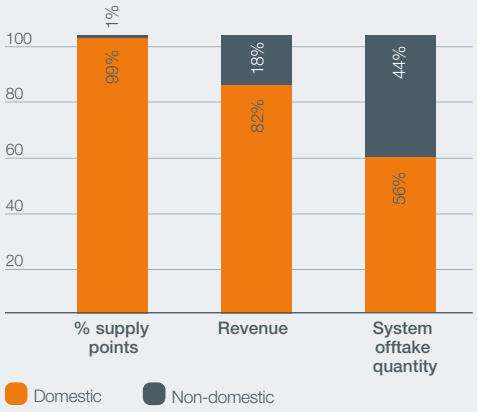
Chapter 8. Customer bills (continued)

This is endorsed within the Ofgem annual performance reports.

The use of our network is constantly changing. We now have 19 biomethane connections and 37 gas fired electricity generators connected to our network. This is in addition to the current 2.5 million supply points that rely on gas for their heating and cooking.

To give context, there are times when a large power station demands more gas than the whole of south Wales. This evolution has taken place over GD1, and is likely to continue as we develop whole systems energy solutions to meet our carbon targets.

Domestic vs non-domestic network usage (%)



We will keep bills as low as possible in GD2 by continually looking for ways to improve the efficiency of our services.

The chart above shows that our non-domestic customers (power stations and large industrial users) make up just 1% of the supply points connected to our network. At peak times, however, these customers account for 44% of total network usage. By contrast, non-domestic load currently accounts for around 18% of revenues. Charges to each user category are subject to our charging methodology, which is approved by Ofgem and is consistent across all GB gas distribution networks. These charges reflect the costs of serving those customers at different pressure tiers.

Domestic customers' charges can vary if significant large industrial loads are added to or removed from our network. We are committed to keeping our charging methodology under review so that all network users pay appropriate charges. For example, as we connect more biomethane sites, we will ensure biomethane producers pay appropriate charges. Similarly, as more electricity generation is connected to our network we will need to make sure customers also pay the correct charges.

GD2 charges are currently forecast based on our existing methodology. However, we are still exploring alternative charging options, should the use of our gas network continue to change. We will explore whether the gas network's energy storage and flexibility provided as a backup to renewable energy could be billed differently. This work will take into consideration the changing nature of the energy system and its usage.

7. NTS charges within the bill

Since 2012, and following industry consultation, it was agreed that 'Gas Exit Charges' from the NTS Operator would be charged to GDNs who would charge shippers. This was a significant change to industry arrangements. Prior to this, the NTS charged shippers directly. The principle behind this move was to incentivise GDNs to book appropriate capacity on the NTS system to minimise overall costs to shippers – and ultimately customers. We support this principle.

During GD1, NTS charges have been volatile, impacting our customers. This is not sustainable and the process needs to be corrected to benefit all parties. At over £40m a year in some years during GD1, the charge from the NTS is the single biggest cost we incur. The volatility has been significant, particularly in comparison with our upfront allowances. This has resulted in two key issues:

- Significant volatility of charges for shippers.
- Significant cash flow shortfall for us, as a result of a two-year lag between NTS changes and our funding allowances.

In addition to this significant volatility, NTS charges must comply with new European Union charging arrangements by October 2019. This has introduced more uncertainty, potential volatility and cash flow shortfalls. We have seen significant increases in NTS charges to us from 2014/15 to 2017/18 – an almost 100% increase from £23m to £42m. There has also been a large variation in forecast charges to us for the period 2018 to 2021. We will seek to keep customer bills as low as possible in GD2, continually looking to improve efficiency.

Given our experience in GD1, we will engage weekly with the NTS charging team. We have been the lead network representative at NTS industry charging forums and have kept Ofgem updated with any issues. We must develop an outcome for NTS charges that delivers a more stable and predictable charging regime for shippers. There needs to be a regulatory solution that avoids any windfall gains or losses for GDNs as a result of changes to NTS charges.

We will continue to work with all industry participants to ensure a satisfactory outcome to this disruptive volatility for GD2.

Conclusion

We will seek to keep customer bills as low as possible through GD2, by continually looking to improve our efficiency levels.

In order to deliver our services sustainably, it is critical that we are properly funded. Shareholders cannot continue to subsidise the business for underfunded debt costs in GD2. These costs were efficiently incurred, and Ofgem has an obligation to ensure that we are financeable as a business – subject to the usual tests of efficiency.

Modelling shows that our business is sustainable, at an average domestic charge of £133 through GD2 – albeit with very limited headroom. Stakeholders consider that we are delivering excellent value for money and support us maintaining our performance levels, keeping charges as low as practical – the same as in GD1.

Chapter 9. Cost efficiency

1. Highlights of our plan

- By the end of GD1, our total expenditure including non-controllable costs will be over £2.5bn. We are forecasting to deliver all of our eight-year outputs at a saving of 19% of controllable allowances – outperforming controllable totex by £421m (2018/19 prices).
- We will have returned £72m to shippers in GD1, and a further £81m of our outperformance will be returned in future years. For gas consumers to see the benefit, shippers will need to pass these savings on through lower energy prices.
- To deliver all outputs required by our stakeholders in GD2 in an efficient manner, annual totex of c.£236.4m per year (2018/19 prices) is required. In delivering these outputs we strive to maintain an upper quartile efficiency position. With this in mind we have externally benchmarked the majority of our business activities, with very positive feedback on our level of efficiency.
- Further improving on our performance in GD1, we are targeting an ambitious average 1.5% per year (0.5% pa compounded) efficiency challenge to the whole of totex in GD2 – amounting to around £18m over the five years, or a cumulative 3% by the end of the period. This is at a higher rate than the current UK economy average forecast of 0.3% per year (Bank of England TFP), which creates a very stretching target when also considering the costs already taken out of the business to date.
- The underlying unit costs of work to be undertaken are broadly similar between the two price controls, despite the obvious growing cost pressures on many of our activities.
- We recognise the unpredictable nature of Real Price Effects (RPEs) and therefore support an approach using appropriate indices.
- The table below shows the summary of average costs across both price controls, along with the average allowances for GD1.

Our commitment

Continue to improve efficiency levels, targeting an efficiency challenge of 0.5% per year – to make sure that customers get best value for money, saving a further £18m over GD2.

Price control average comparisons

£m 2018/19 prices	Average GD1 annual allowances	Average GD1 annual spend (8-year forecast)	Average GD2 annual spend
Controllable opex	109.5	92.0	96.9
Repex	103.6	80.0	88.4
Capex	64.2	52.6	51.1
BAU totex	**277.3**	**224.6**	**236.4**

2. GD1 totex expenditure

Totex position

Since 2005 we have reduced costs year on year, whilst delivering all outputs and work targets.

GD1 allowances and forecasts

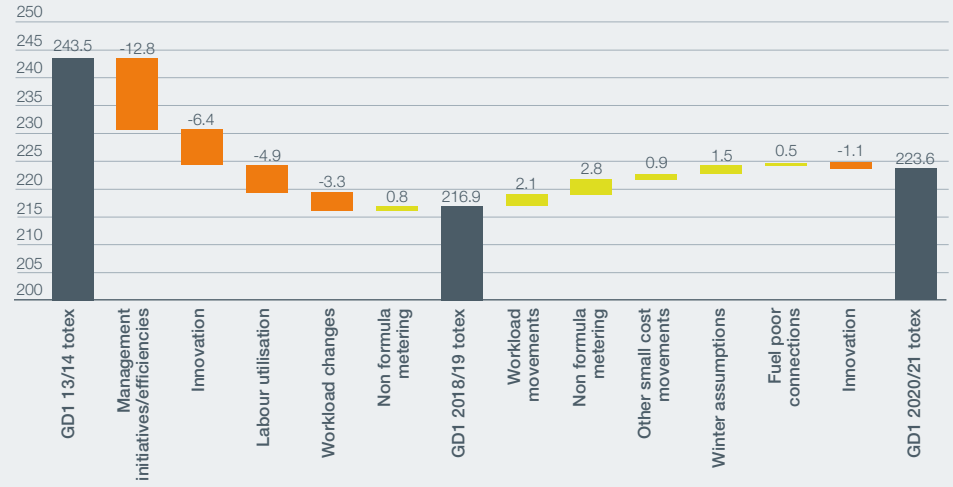
£m 2018/19 Prices	GD1 allowance	GD1 forecast	Difference
Controllable opex	875.9	736.4	139.5
Repex	828.9	639.9	189.0
Capex	513.8	421.2	92.6
Controllable totex*	**2,218.6**	**1,797.5**	**421.1**

* Non controllable forecast for GD1 is £0.7bn.

Click **Chapter 4: Track record** for detailed explanations of spend and outperformance. 25

The graph below shows the controllable totex movement across six years of actuals and the final two years forecast to the end of GD1, which demonstrates how we are actively managing costs through the period.

Totex moving through RIIO-GD1, 2018/19 prices (£m)



Chapter 9. Cost efficiency (continued)

GD1 expenditure to date (2013/14 – 2018/19)

Our controllable expenditure has reduced over the six years to date as described below:

Management initiatives

Delivering an affordable and clean energy solution for the future.

Throughout GD1 we have focused on delivering outputs, improved service levels and cost reductions. The £12.8m of management initiatives has delivered benefits to WWU, whilst reducing costs to the consumer. The introduction of new shift patterns and performance management systems has improved the productivity of field workers. Cross training our staff across different activities to utilise unproductive time and ensure all work is completed has added to the benefits. Changes to terms and conditions, a younger workforce and a focus on productivity have also contributed to the efficiencies.

Innovation

Investment in new working practices brings monetary, safety and social benefits.

Investment in new working practices has resulted in a benefit of £6.4m since the start of GD1 (this equates to a total of £9.7m including cost avoidance). As a result of these innovative techniques we have improved productivity, safety and the customer experience, and have ensured a reliable energy supply for the future.

Process innovation has delivered a £0.5m/yr cost reduction, increasing our first time permanent reinstatement rate vs 2012.

Labour utilisation

Improved utilisation across all work activities has brought many benefits – from reducing external spend on contractors to service improvements and improved productivity. Examples of this include first call operatives undertaking mains replacement and maintenance activities, and repair staff working on replacement activity in the summer months when leakage is at its lowest

Workload variations

Due to the specific requirements of each year's programme of work, and our drive to complete this work early in the price control for consumer benefit, workloads have fluctuated annually. For example, a higher mains replacement workload at the start of the period has enabled us to get ahead with the risk reduction in our programme. Customer driven work also varies from year to year, along with asset intervention cycles.

Non-formula metering

We have successfully secured this non-formula work since 2005, which is outside of the regulatory deal. The work is carried out by our first call operatives in the downtime that inevitably occurs due to the nature of the emergency work. The revenue generated by this work offsets the full (unsubsidised) costs of the 24/7 emergency activity – with customers benefitting from lower residual regulatory cost. We are currently unique among GDNs in offsetting emergency cost in this way.

Click **Appendix 9A** for further information on loss of metering.

GD1 forecast expenditure (2019/20 – 2020/21)

As we move into the final two years of GD1 there are a number of assumptions built into the forecast.

Workload phasing – and output delivery is increasing workloads by £2.1m, linked to the phasing of asset intervention cyclical work, as well as plant and vehicle replacement cycles. We are still on target to achieve all outputs by the end of GD1. This is related to workload cyclical processes not deferral of work.

Non-formula metering contracts – loss of non-formula metering activity discussed above will result in the inevitable stranding of non-productive time for emergency service staff – resulting in a £2.8m increase in formula opex.

Winter forecasts – winters experienced so far in GD1 have been very mild compared with the '1 in 20 winter' we are required to plan and resource for. While the 'Beast from the East' experienced in 2018 had some characteristics of a more severe winter, it was very short lived. The last severe winter we experienced was back in 2010/11, when we experienced costs almost £2m greater than milder winters – however even this winter was not a 1 in 20. An assumption of a more severe winter is made for the forecast years (but not a 1 in 20). The higher costs mostly relate to the additional leakage we would face – coupled with the additional logistical difficulty of getting to these escapes, particularly in more remote areas.

Fuel poor targets – and demand for new connections is estimated to increase in 2020/21. This results from fuel poor targets and projected economic activity. This will also affect the volume of our reinforcement work.

Click **Chapter 17: Connecting homes and businesses** for further information. 164

GD1 comparative totex performance and cost assessment methodology

Whilst we constantly review our performance internally, we also seek to ensure we are efficient across our sector. The benchmarking regression results that Ofgem published in the 2017/18 performance report on business efficiency

Top down totex regression

GDN	2013/18 5-year	2017/18*	2018/19	2019/20	2020/21	Cumulative
EoE	5	8	5	7	6	5
Lon	8	7	8	8	8	8
NW	7	4	4	4	4	4
WM	3	3	3	2	2	3
NGN	1	2	1	3	3	1
SC	4	5	6	5	5	6
SO	2	6	7	6	7	7
WWU	6	1	2	1	1	2

* From the Ofgem annual report 2017/18.

Chapter 9. Cost efficiency (continued)

(the most recent available) are detailed in the table below. We have included forecast data for all GDNs to the end of GD1.

Ofgem's analysis shows that we are the most efficient network in totex regressions for Ofgem's most recent annual report and our projections show us as second for the remainder of GD1. This does not consider the one-off benefits we have achieved in GD1. If we adjust the regressions for these benefits, we are placed in the middle of the pack for 2017/18.

Click **Appendix 9B** for details on one off cost savings.

The work we have undertaken to enhance our efficiency includes initiatives such as maximising the utilisation of resources, measuring and managing performance at the granular team level, optimisation of asset decisions and work, and fully market testing activities and expenditure.

Our performance during the first five years has involved accelerating workload where appropriate to generate consumer benefits earlier, along with investment in systems and performance management, to help deliver lower network charges in the second half of GD1.

We forecast and monitor workload and outputs against Ofgem targets monthly in order to identify any impacts to consumer bills and delivery changes. We are not anticipating any workload deferrals into GD2 from GD1.

Despite the positive results of current benchmarking, we believe the current methodology does not fully reflect the real underlying cost drivers of the networks. We have shared our own analysis and evidence with Ofgem, which we also set out in the next section.

Cost assessment methodology

We are currently working alongside Ofgem and the other GDNs to improve the assessment methodology used in setting GD1. Our high-level findings so far, which are supported by our consultant's report, are:

- current regression analysis does not consider the relative condition of assets between GDNs;
- the weightings of Composite Scale Variables (CSVs) do not consider the relative cost of each of the underlying activities or the effort involved in carrying out those activities;
- modern equivalent asset value (MEAV) is a scale driver and does not reflect anything other than the scale or relative size of the network assets, while the main cost drivers include condition, health and customers. An alternative cost driver needs to apply health indices to current MEAV calculations to consider the additional effort in more frequent maintenance, call out, faults and intervention required;
- cost drivers do not take account of the fixed costs of departments – the underlying costs for fixed overheads should be removed from regressions and dealt with as a non-regressed cost item.

We explain our views in relation to the more detailed opex, repex and capex regression analysis in the sections that follow. We are committed to continuing to work with Ofgem and the other GDNs to develop the cost assessment methodology further in the lead-up to Initial and Final Determinations.

Click **Appendix 9C** for further information on methodology and cost driver alternatives.

3. GD2 totex expenditure

Explanation of average GD1 to GD2 total controllable totex

To deliver all our commitments in GD2 we have assessed in detail the expenditure we will need to make. The table below shows the average expenditure between price controls.

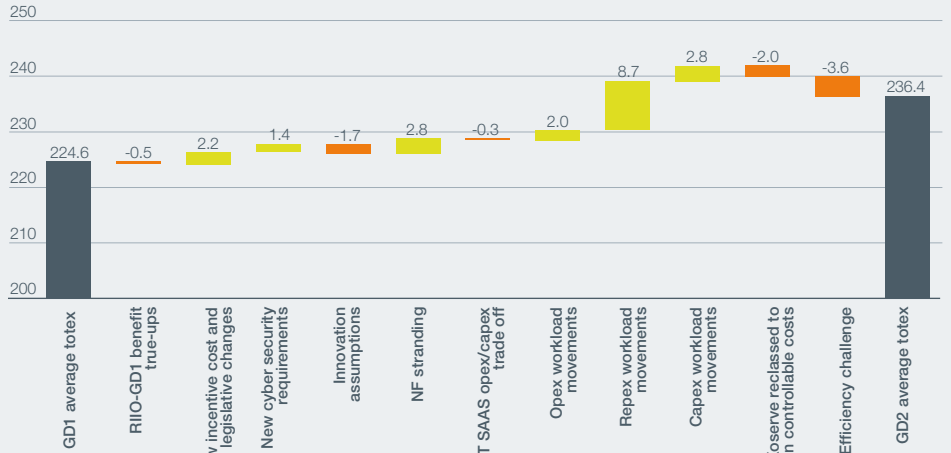
Average price control totex

£m 2018/19 prices	Average GD1 annual spend (8-year forecast)	Average GD2 annual spend
▶ Controllable opex	92.0	96.9
▶ Repex	80.0	88.4
▶ Capex	52.6	51.1
▶ **Controllable totex**	**224.6**	**236.4**

Our average controllable totex is increasing between GD1 and GD2. In summary, this is due to some significant changes to market factors, workloads and addressing stakeholder feedback.

The material movements are discussed below.

Totex GD1 average v GD2 average, 2018/2019 prices (£m)



Chapter 9. Cost efficiency (continued)

GD1 benefit true ups – in GD1 we have benefited from some one-off credits and contractual wins. Releasing £6.7m of accruals relating to pre GD1 has lowered our cost base by an average £0.8m per year. However, these costs need to be added back to the future cost base as they are classed as 'atypical' costs and we will not benefit from these again. Our current mains replacement alliance contract has benefited from a pain/gain sharing mechanism and, as this contract ends in 2020/21, £1m pa needs to be added back to reset the artificially low costs we have incurred in GD1.

Click **Appendix 9D** for our GDI mains replacement performance.

Click **Appendix 9B** for information on our one off benefits for information on our one off benefits.

The PSUP costs incurred in GD1 will not be repeated into GD1; which amounts to £2.3m average per year.

New incentive costs & legislative changes – we have included £0.8m per year for the vulnerability 'use it or lose it' allowance. This is included following Ofgem's confirmation of the allowance in the May 2019 RIIO-2 Sector Specific Methodology Decision Document and has been tested for support by our stakeholders.

Click **Chapter 7: Social obligations** for our proposals on the value we plan to add by investing this money. 62

Street works legislation and small workload movements are contributing a minimal cost increase across opex, repex, and capex per year.

► **Cyber security –** while Ofgem is now the relevant Competent Authority on cyber security for the energy networks, they are currently consulting on their requirement, so we have included a re-opener mechanism to address these costs. Our cyber investment as part of our IT security plan is £1.4m per annum on average.

Click **Chapter 21: Business IT security plan** for further information. 189

Innovation – we welcome the recent decision to retain the NIA. We have excluded innovation costs until we understand the funding mechanism. Our innovation chapter discusses future requirements.

Click **Chapter 11: Our innovation strategy** for further information. 92

► **Non-formula meter work** is reducing in GD2 to zero. Customers have benefitted in GD1 from our gaining non-formula meter work contracts (around £6m less charged to customers – as an average year in GD1). We have made use of the unproductive time which occurs as a result of our LOs, however this is coming to an end due to the loss of meter work. As smart meters are installed and older meters removed, the requirement to do this work for suppliers diminishes, therefore pushing non-productive time back into opex. We have not included costs on the impact of smart metering in our base totex, this is explained in Chapter 12: Uncertainty mechanisms.

Click **Appendix 9A** for further details on loss of metering.

IT software as a service (SAAS) – as technology changes and cloud storage is introduced, the need for physical storage diminishes, which in turn increases opex costs and reduces capex costs resulting in a net reduction in IT costs of £0.3m per year.

Click **Appendix 9E** for more information on the IT SAAS costs.

Repex workload movements – the expenditure is increasing by an average £8.7m per year due to:

- the workload mix and technique to lay mains is changing as the work becomes more challenging; this accounts for around half of the increase;
- the pipe material mix moving towards more ductile iron and steel, increasing the labour effort, adding an additional £2.6m per annum;
- regional movements in work have resulted in mobilisation costs and material prices and changes of £1.7m per year.

We estimate a cost avoidance of £0.5m/year if trials of our live innovation project 'Cryogenic Cracking' are successful.

The Alliance pain/gain contract benefit of £1m per year is also impacting the cost increases within repex.

£3.6m
cost efficiency reduction per year.

Efficiency challenge – we have applied an ambitious 1.5% average (0.5% pa compounded) totex efficiency saving which reduces totex by £3.6m per year. This has been applied across all areas included in totex. Over the five-year price control this is just under £18m and a c.3% challenge. We plan to achieve this through BAU innovation projects and the continuous focus we have on improving the productivity of our workforce.

Click **Appendix 9F** for the productivity reports – WWU specific

Click **Appendix 9G** for the productivity reports – joint GDN

Real price effects – Ofgem has indicated they are looking to index RPEs. Until the indices are agreed as part of the business plan process, and as agreed with Ofgem, we have not included a forecast of RPEs in our base submission.

Click **Appendix 9H** for the RPEs consultant's report.

Independent benchmarking reports

We have commissioned external organisations to test the efficiency of a number of our back office functions including Finance and Procurement, People and Engagement, IT and Office and Deport Property Portfolio.

Click **Appendix 9I** for the finance independent benchmarking reports.

Click **Appendix 9J** for the people & engagement independent benchmarking report.

Click **Appendix 9K** for the office & property independent benchmarking reports.

Click **Appendix 9L** for the IT independent benchmarking reports.

Chapter 9. Cost efficiency (continued)

4. GD2 operating expenditure

Explanation of cost movements

In order to better understand our cost base and ensure we are as efficient as possible we look at our regression position. We have run the period to date and forecast positions using the GDN submitted data.

Below is the opex regression that Ofgem currently uses to benchmark the GDNs.

Opex regression top down forecast annuals

GDN	2013/18 5-year	2018/19	2019/20	2020/21	Cumulative
EoE	8	4	7	7	7
Lon	6	8	8	8	8
NW	3	7	6	6	6
WM	7	6	5	3	1
NGN	2	2	3	2	5
SC	1	3	4	5	3
SO	5	5	1	1	4
WWU	4	1	2	4	2

We are upper quartile for the GD1 price control, demonstrating an efficient level of costs. However, we deteriorate in 2020/21 due to the stranding back of FCO waiting costs currently being charged to non-formula metering work on the expiry of our contracts for that work, and a prudent winter assumption. Other GDNs have already lost non-formula work earlier in this price control.

We are striving for upper quartile in GD2 and will displace as much stranded non-formula costs by using FCOs on other workloads and efficiently delivering work. Some of the non-traditional workloads we utilise FCOs on include purge and relights for mains replacement, connections surveys and maintenance activities.

As set out above, the current methodology for opex benchmarking is not fully reflective of the cost drivers and should be updated to include the observations below.

Opex cost efficiency methodology

Our observations

- Current regressions do not consider the relative condition of maintained assets between GDNs or the opex/capex trade-offs for IT or network management work.
- Weightings of the CSVs do not take into account the cost of each of the underlying activities or the effort involved in carrying out those activities.
- Work management needs its own set of drivers, which are currently not reflected in the CSVs.

Our suggested approach

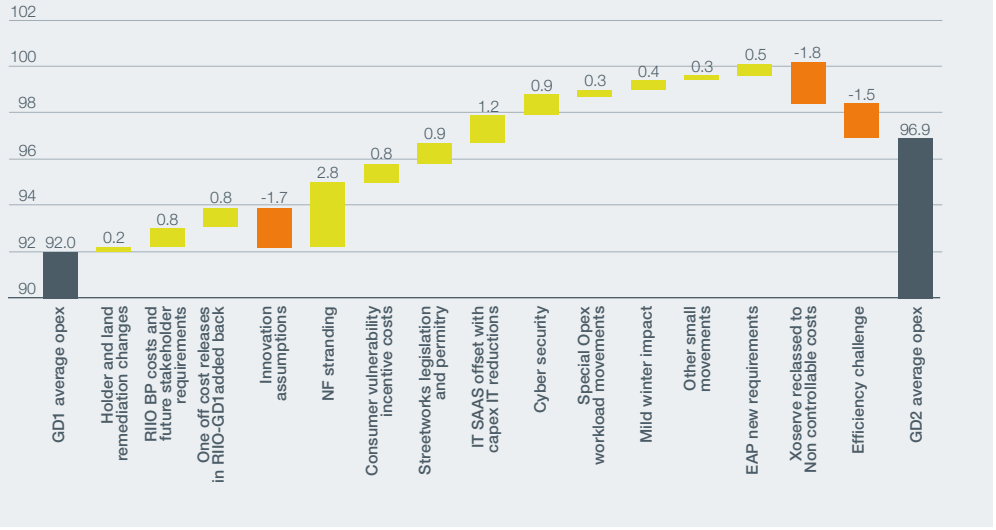
- Cost drivers need to apply health indices to current MEAV calculations to consider the additional effort in more frequent maintenance, call outs and faults and intervention required.
- Work management needs workload drivers including MEAV and relevant operational workloads.
- Cost drivers ignore the fixed costs of departments – more underlying costs for fixed overheads should be removed from regressions.

Click **Appendix 9C** for cost efficiency benchmarking consultant's report.

The waterfall below shows the main movements across the comparative average years for GD1 and GD2 in detail, with the main drivers explained in the totex section previously.

We continue to focus on efficient costs and delivering our outputs and maintaining safety standards, which is reflected in our cost base and is not significantly changing between price controls.

Opex GD1 average v GD2 average 2018/2019 prices (£m)



Chapter 9. Cost efficiency (continued)

5. GD2 replacement expenditure

Explanation of cost movements

The benchmarking of repex is carried out using synthetic unit costs based on an historical average of the GDN's performance. We have forecast the last three years using this approach and the shared RRP forecast cost and workload data.

Repex regression – Top down

We are in the top half of the table for the five years' regressions and, based on our analysis, are improving towards the end of GD1, to upper quartile.

Efficiency improvements made at the latter end of the price control are masked by the pain/gain contractual mechanism.

Click **Appendix 9C** for cost efficiency benchmarking consultant's report.

We will continue to negotiate competitive market prices for mains replacement works.

The regressions run as part of the benchmarking are not reflective of the most current data available and Ofgem should consider the items below.

Repex cost efficiency methodology

Our observations

- Current regressions do not reflect latest unit costs because they are not updated for the current experienced unit costs and are missing some activities from the synthetic unit costs calculation.
- The weightings of the CSVs do not consider the cost of each of the underlying activities and effort involved in carrying out activity, which means the driver is not reflective of the cost base incurred.
- Special crossings and multi occupancy building costs are not reflected in synthetic unit costs used by Ofgem and therefore any spend in these areas impacts the ranking in the regression. During the last five years we have completed large expensive special crossings, which will have an adverse impact on our position.

Our suggested approach

- Synthetic unit costs need to reflect market rates of work by diameter, technique and number of connections required.
- Special crossings and MOBs should be part of non-regressed activities and efficient costs assessed separately.

Click **Appendix 9C** for cost efficiency benchmarking consultant's report.

The waterfall below shows the main movements across the average comparative years of GD1 and GD2, in detail, with the main cost drivers explained.

MOB work – is reducing from GD1. Our focus on replacement and refurbishment reduces from GD1 based on volumes of these type of buildings in our network and the risk removed over GD1.

Special crossings – these are unique mains replacement projects which require specialist labour, specific planning and technical leads to complete, and are typically found on bridges over rivers or railways.

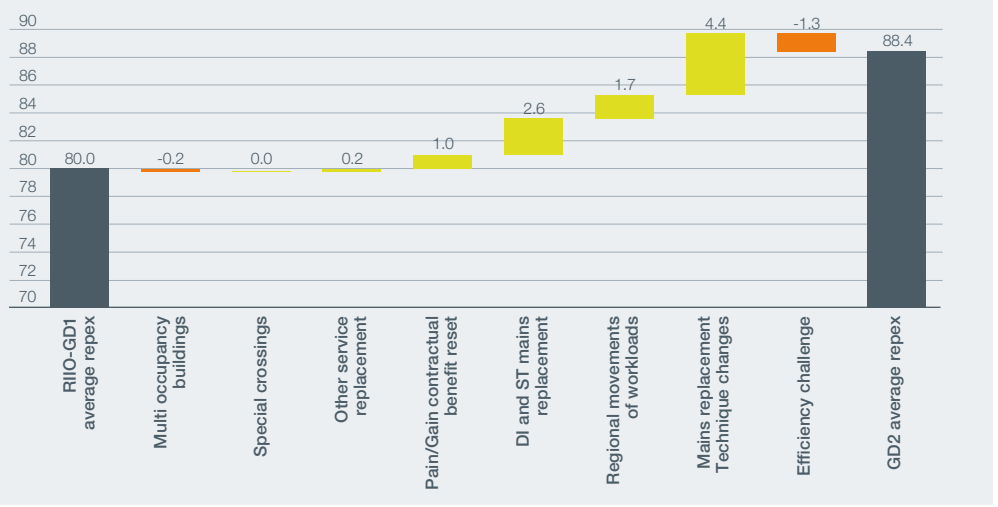
Many of these expensive projects have been completed in GD1 in line with risk profiles; a notable project completed in GD1 is the Bideford Bridge project, a listed bridge with a specific requirement costing us c.£1.1m to complete.

Other service replacement – the average winter assumed for GD2 is higher than the mild weather experienced in GD1 as already mentioned. Therefore there is a small increase in non-mains replacement services and relays following escapes.

Repex regression top down forecast annuals

GDN	2013/18 5 year	2018/19	2019/20	2020/21	Cumulative
EoE	3	5	6	6	5
Lon	8	8	8	8	8
NW	1	3	3	3	3
WM	7	2	4	4	4
NGN	5	1	1	1	1
SC	6	6	5	5	6
SO	2	7	7	7	7
WWU	4	4	2	2	2

Repex GD1 average v GD2 average 2018/19 prices (£m)



Chapter 9. Cost efficiency (continued)

While we have fully delivered on our GD1 commitment, including by diameter band within Tier 1 work, we are forecasting an increase in costs for this work in GD2 by an average of £9.7m per year.

Mains replacement cost drivers

Reviewing how we contract our mains replacement work.

- Smaller and more diversified projects leading to reduced efficiency. There is diminishing opportunity to create the very large and efficient projects that we achieved in GD1, because the remaining risk profile is driving work to the network extremities and to smaller schemes, which are less efficient and relatively more costly.
- Higher levels of open cut work or technique changes (versus insertion), which is more expensive, with smaller projects, totals £4.4m.
- The pipes that need to be replaced in GD2 have been analysed extensively and we will need to use the 'open cut' technique significantly more than in GD1 where the insertion technique is not viable. This is more expensive because of the increased materials needed to reinstate the excavations, the longer time taken for the increased excavations, and the disruption to roads requiring more street furniture (barriers and traffic lights). Open cut, which is a main cost driver, is increasing to 20% compared to 8% of total workload in GD1.
- More work being undertaken in Devon & Cornwall causing regional movements, where aggregate and tipping related costs are higher, totals £1.7m.
- The work involving more ductile iron and steel mains replacement, which have greater engineering challenges than spun and cast iron, totals £2.6m.The resetting of the current pain/gain sharing mechanism with our Alliance partners and a shorter five-year contract duration, totals £1.0m. The savings from the existing pain/gain mechanism within our current eight-year repex contract to deliver mains replacement will no longer be available as this contract ends in 2021. We will need to renegotiate a new contract based on current efficient costs for GD2.

Click **Appendix 9D** for further detail on our mains replacement performance in GD1.

6. GD2 capital expenditure

Explanation of cost movements

Capex regressions are based on a mixture of weights and the majority is a scale driver determined using the asset base of individual networks (MEAV). We have run future year regressions using the Ofgem methodology and the forecast information included in the annual RRPs. Please see table below.

Capex regression 'top down' forecast annuals

Our performance during the first five years is impacted by the inclusion of £18.5m worth of PSUP costs, which have no cost driver included in the regressions, and therefore moves us down the rankings in comparison to some of the other GDNs' CPNI work.

Connection workloads are not fully accounted for in the weightings and some work types are missed from the scale driver ie fuel poor workloads.

Our efficiency improvements are made at the latter end of the price control as land and property costs reduce and the phasing of work and asset replacement varies.

The regression drivers that are currently in use are not fully reflective of the cost base; recommendations for improvement are below.

Capex cost efficiency methodology

Our observations

- The current capex regression does not reflect workload weightings in the CSV; connections and mains reinforcement are less than 10% but incur closer to 50% of the costs, impacting the driver weighting and not reflecting the costs incurred.
- Fixed costs of departments are not considered in regression; departments such as connections quotes and diversions back office teams are required regardless of workloads so need to feature in the CSV.
- The MEAV driver does not consider the relative condition of assets, only the network's scale, as discussed in previous sections.

Our suggested approach

- Using synthetic unit costs that reflect market rates of work by diameter, technique and number of connections required (for both connections and reinforcement) would improve the regressions and add missed unit costs such as Fuel Poor.
- Updating MEAV to consider the health of assets along with volume and scale would balance the CSV and better reflect the cost base incurred.
- The weighting of the CSVs should be updated to reflect workload and costs, which would help improve the R^2 and result in improved correlation between costs and the driver.
- Any benchmarking should also be done on a consistent gross cost basis for all work to avoid the inconsistency on income, including timing and rate differences between GDNs.

Click **Appendix 9C** for cost efficiency benchmarking consultant's report.

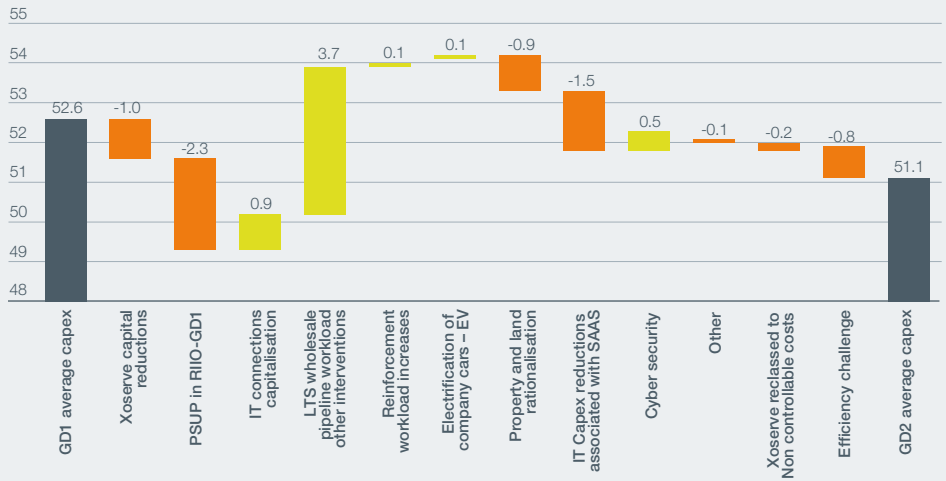
Capex regression top down forecast annuals

GDN	2013/18 5-year	2018/19	2019/20	2020/21	Cumulative
EoE	2	6	6	5	4
Lon	7	5	5	7	7
NW	5	4	4	3	3
WM	3	1	1	2	1
NGN	6	7	8	8	6
SC	4	8	7	6	8
SO	1	2	3	1	2
WWU	8	3	2	4	5

Chapter 9. Cost efficiency (continued)

The waterfall below shows the main movements across the comparative years, in detail, with the main drivers explained.

Capex GD1 average v GD2 average 2018/2019 prices (£m)



► **PSUP costs –** have been incurred and agreed through the uncertainty mechanism process and we are not expecting these to reoccur in GD2 now that the sites that required upgrade were all completed by 2018/19.

IT connections capitalisation – we changed our accounting policy in 2017/18 to capitalise IT costs associated with the connections business to allow us to reflect the costs incurred and include in the connections charges.

► **LTS wholesale pipeline –** the inclusion of a 13km pipeline replacement over three years, 2022-24, is pushing up LTS costs. We have not carried out any of these workloads during GD1 and by nature they are expensive, at around £1m per km to install.

This pipeline accounts for on average a £2.6m per year increase; the remaining increase is linked to the capital interventions required to maintain the health and condition of the asset.

Click **Chapter 18: Transmission and pressure management** for further information. 173

► **Reinforcement workloads –** are increasing between price controls, due to the need to provide more gas connections in response to increased demand in some areas and to support gas fired power stations in others.

Click **Chapter 16: The distribution network** for further information on the drivers of the increase. 148

EV charging stations – part of our environmental strategy includes decarbonising the network as much as possible. To support this we will be installing charging stations in our depots and offices across our region to enable the move to hybrid/electric company cars in the future.

Property strategy – work is expected to be completed in GD1, rationalising our property portfolio and purchasing depots where possible to save ongoing, more expensive rental costs. The costs required into GD2 relate to replacing end of useful life office furniture and some major fixture and fittings improvements.

IT SAAS capex and cyber security – please see comments under totex above for an explanation.

Our commitment

Ensure that the investments we make today will support future energy scenarios and therefore represent a 'no regrets' energy solution.

7. Unit cost analysis

To understand the costs of carrying out work we analyse our work activities on a unit cost basis. This means we can understand materials, labour and the support required to deliver the workload and outputs.

All costs are established on a 'bottom-up' basis using labour times per job, detailed material lists per activity, and fixed and overhead assumptions for back office departments. This allows us to understand the impact of the variability of workloads on the cost base and to drive efficiency.

Using this basis for costing makes our cost base certain. All uncertain costs are included in the uncertainty chapter and are not in base totex.

The forecast unit costs are based on our historic performance.

Click **Appendix 9E** for details, along with the cost drivers.

8. Improved productivity growth CVP

We recognise the need to deliver ongoing efficiency benefits to consumers. We have commissioned a joint GDN report and a separate WWU report to understand the current macroeconomic factors in establishing the growth rate. This provides a suitable challenge relevant to the gas industry and the wider UK economy.

A number of factors determine the level of efficient costs and productivity challenge. These include frontier shift efficiencies, catch up efficiencies, input price efficiencies, and scale efficiencies. These factors are all linked and need to be considered when looking at future and past performance for the gas industry. Historically there has been no consensus by regulators on how a benchmark for productivity growth is established across regulated companies.

GD2 unit costs are based on our historic performance.

Chapter 9. Cost efficiency (continued)

The efficiency challenge set by Ofgem for GD1 was linked to total factor productivity growth (TFP) (the ratio of all inputs to all outputs for an industry) for a number of UK sectors from 1990 to 2007. Since then, due to the economic down turn, loose monetary policy and future uncertainties, many industries have been forced to reduce short-term forecasts of productivity.

Our view on improved productivity growth currently sits at 0.5% per year compounded over the five years, resulting in nearly 3% per year by the last year of the GD2 price control. This is a core part of our CVP.

This assumption is linked to the Bank of England view on the inability to replicate pre-crisis productivity and assumes we are an upper quartile company as per our GD1 performance. This should set the benchmark for the other GDNs in relation to catch up efficiencies. Below shows the Bank of England's TFP view in the short term. If this was extrapolated forward, the 0.5% assumption we have included will be challenging to deliver in GD2.

Table 4: Average annual total factor productivity growth

	1998 /07	2008 /10	2011 /14	2015 /18 Q3	2018 Q3 /22 Q1
TFP growth[1]	1.0%	-0.6%	-0.1%	**0.2%**	**0.3%**

1 Bank of England February 2019 inflation report.

Click **Appendix 9F** for the WWU specific consultant report.
Click **Appendix 9G** for the GDN shared consultant report.

CVP Our efficiency savings will create an £18m saving to customer bills in GD2.

Our commitment

Continue to improve efficiency levels, targeting an efficiency challenge of 0.5% per year – to make sure that customers get best value for money, saving a further £18m over GD2.

9. Regional factors and cost pressures

Regional factors identify cost differentials across the eight gas networks. Where Ofgem's costs models do not capture these and adjust accordingly, we require a regional cost adjustment claim as part of the Ofgem cost assessment toolkit.

We have identified only two overarching factors which Ofgem need to consider for us. These are sparsity/density and regional wage differences. We also considered other 'in the round' factors which we document below.

Sparsity/density impacts us in GD2 in a similar manner to GD1 – our network is long, irregularly shaped and drawn out. This is clearly different from some other networks, most notably the West Midlands which is almost circular in shape. We have clusters of customers and large empty patches, with long driving times between local networks. Interestingly, 5 (33%) of the 15 UK national parks are found in our network, adding to the situation.

The urban areas are impacted by high customer density compared to less extreme networks, which also drive costs up in relation to above ground congestion including roads and buildings and low average speeds of travel.

Given this relationship between sparsity and density, we propose a joint regional factor to address this.

Regional wage differences have traditionally been calculated using a London weighting, with areas outside of the M25 receiving zero impact. Our consultants have identified that wages in London (industry specific) are not systematically different to the rest of the UK.

We are facing challenges in terms of labour availability and associated wages. This is partially due to demographics, local large projects such as Hinkley C and rail electrification, and the pull of higher wages offered by other GDNs as they attempt to deliver on their GD1 outputs.

Additional factors discounted on the basis of the sector specific methodology direction, based on materiality, are Welsh Government and Welsh language obligations. These cost us c.£0.8m per year in Welsh translation, additional printing, road signs and resources to communicate with both governments. This is a cost we incur and currently absorb as part of totex.

We face labour challenges in GD2 due to Hinkley C and rail electrification, amongst others.

We therefore propose just two regional factors for consideration, which reflects the Ofgem sector specific methodology and our cost base.

Click **Appendix 9M** for calculations on how this mechanism would work.

10. Real price effects

Real price effects can have a significant impact on our cost base, from wages to material prices including any linked to the oil price. We fully support the indexation of these costs to receive an allowance for the cost pressures we incur in the gas industry.

Ofgem has already stated in their Sector Specific Methodology Decision dated 24 May 2019 that they are considering setting upfront RPE allowances with an annual true-up relative to the outturn indices in each year of the price control.

Our report considering our approach covers the following items:

- our view of indexation
- the preferable indices's selection
- how we would calculate RPEs
- implementation of indexation
- expenditure categories impacted
- evidence for all proposed RPEs.

Our analysis concludes a labour RPE for GD2 of 0.6% per year based on our forecast cost structure, which is the most material area of RPEs. Our justification for other RPEs is covered in the appendix.

Chapter 9. Cost efficiency (continued)

Its key indexation is consistent with the frontier shift assumptions and RPEs are reflective of cost pressures experienced by the GDNs.

Considering this proposal and our view on ensuring the RPEs are cost reflective, the design of this framework and the RPE indices selected are key.

The indices also need to be applied to the correct expenditure categories. Ofgem mentions using the notional company, which we would recommend is reflective of the upper quartile company in GD1. That considers the efficient company totex cost base to calculate the RPEs. We fully support the indexation of RPEs.

Click **Appendix 9H** for a principles log for establishing the relevant indices documented by our consultants.

11. Customer and stakeholder feedback

We have sought customer feedback on our commitment to target a 0.5% efficiency level each year. Through a series of regional stakeholder workshops, we were given an average score of 8.6 out of 10 for our efforts in delivering value for money, while one workshop scored it 10 out of 10.

Our stakeholders told us to, at least, maintain our efficiency in order not to change their perception of the value we provide them.

Customers found the complexity of understanding how efficiency is calculated difficult which limited the amount of stakeholder feedback we received.

However, our innovation deep dive workshops indicated more interest in the non-financial aspects because participants expected bills to go up anyway in the long term post GD2.

The independent CEG has consistently challenged our 1.5% (0.5% pa compounded) efficiency proposal. Their view is that this lacks ambition, which is in line with the feedback we also received from the RIIO-2 Challenge Group.

While we understand that the 0.5% per year efficiency target (compounded) may seem low, it is well above the current UK economy average forecast of 0.3% per year (Bank of England TFP); as such it creates a very stretching target of almost 3% per year by 2026.

This is also combined with the cost already taken out of the business to date and our leading position on efficiency within the industry. This remains an open challenge from the independent CEG.

In addition to conducting a series of stakeholder workshops in 2019, we undertook a deep dive session on the topic of value for money. Those who attended were supportive of our ambitious efficiency target stating that it is good to challenge ourselves, especially with the future uncertainties and economic factors that are outside of our control.

Improving efficiency levels was the 5th (out of 25) most important commitment to domestic customers and SMEs during our willingness to pay research, with overall acceptability for the 0.5% pa compounded per year target.

In summary, the feedback that was collated from the eight engagement events that we have held with over 2,000 stakeholders indicates that there is wide support for our commitment to an average 1.5% efficiency (0.5% pa compounded), as demonstrated by an overall acceptability score of 60%.

Click **Appendix 5F** for detailed information about our engagement.

5/25

Improving efficiency levels was the 5th most important commitment for our domestic customers.

We have also consulted on our pension scheme. We are proactive at managing costs and risks associated with the scheme and the interests of our consumers. We consulted with over 400 stakeholders to understand the risk appetite using a variety of questions framed around simple everyday scenarios.

Overall customers were fairly risk adverse when it came to investment/repayment strategies and this is consistent with our current investment profile, with around 40% less risk being taken under the current investment strategy which has been in place since 31st March 2013.

Click **Appendix 9N** for further information the pensions stakeholder engagement.

Click **Appendix 9O** for pension evaluation.

Conclusion

Our controllable costs are increasing by 5% on average (between GD1 and GD2), coupled with improved service quality and a reliable network with a firm reputation for achieving licence obligations.

The main changes in the cost base relate to mains replacement which include increases in contract costs, changing techniques and smaller projects that are less efficient. In addition, the loss of non-formula meter work increases operating costs.

There are some additional costs due to legislation changes for street works and increased investment in cyber security as well as some small workload increases.

Our plan contains our view of the efficient costs to deliver the growing number of commitments and outputs we are required to deliver.

Ofgem has recently consulted on the cost toolkit for GD2, and has said it will take that consultation into account when it assesses the business plans that are submitted in December.

Our benchmarking results show us to be at least upper quartile in all areas of totex through GD1. We have broadly used our GD1 unit costs in preparing our business plan and therefore we expect to maintain that upper quartile position into GD2.

Chapter 10. Using competition to deliver best value

1. Highlights of our plan

- To ensure best value for our customers and deliver the outputs they require we use competitive tension and good procurement practice. We take our responsibilities in this area very seriously.
- Each year we purchase goods, works and services to the value of approximately £220m. We market test the vast majority of the goods, works and services that have a value above £5k and are sourceable[1] (ie are delivered through the supply chain). This equates to a programme of around 75-80 procurement events a year.
- Our approach has enabled us to maintain our overall expenditure at £220m a year (by driving cost efficiencies, ensuring we secure the best market rate, and helping us to mitigate cost increases).
- We are currently undertaking a substantial programme to fully market test all of our operational activities, representing a procured value of around £100m a year.
- An external benchmark of our back office, including the procurement team, that was carried out in 2018, found that we are sector leading in efficiency[2].
- The tender pre-qualification process and introduction of a Supplier Charter will align our procurement plan with our Environmental Action Plan.
- Environment, sustainability and bio-diversity will feature heavily in our decision making and contract award criteria.

1 Non-sourceable items are those we are not able to test such as business rates, taxes and pension payments.
2 ImprovIT & Alchemmy, 2018, Click **Appendix 9I**.

2. Our approach to early, late and native competition

Early and late competition

Ensuring a fair, transparent and responsible procurement process.

We fully support Ofgem's proposals in relation to early and late competition, as outlined in its Sector Specific Methodology decision document. We believe that our existing procurement process aligns with Ofgem's approach.

As part of our annual planning process we test projects against the criteria that are currently applicable to electricity transmission (new, separable, high value) to identify whether any projects would be eligible for early or late competition. None of our projects currently qualify for early or late competition under these criteria. Table 1 sets out a number of sample GD1 projects, and the results against the criteria.

Looking ahead to GD2, it is also the case that none of the projects in this business plan will qualify for early or late competition.

This includes our activities in relation to asset resilience and to deliver our net zero vision.

Our operations comply with relevant legislation including UK competition legislation and EU Procurement Regulations. These regulations operate under the principles of equal treatment, non-discrimination, proportionality and transparency. Importantly the regulations encourage early market engagement and in 2015 were updated to mandate tender specifications being available at the beginning of tender events.

Native competition plan

Native competition involves competitive processes occurring within the price control, where the incentive is native to the totex incentive mechanisms.

We believe that the procurement policy and procedures we have put in place facilitate strong native competition and will continue to do so into GD2. Our procurement process covers the whole life cycle – from identifying needs, through to the end of life of the asset or service. It involves options appraisal and critical 'make or buy' decisions (ie whether or not to provide services in-house).

Table 1: Sample projects

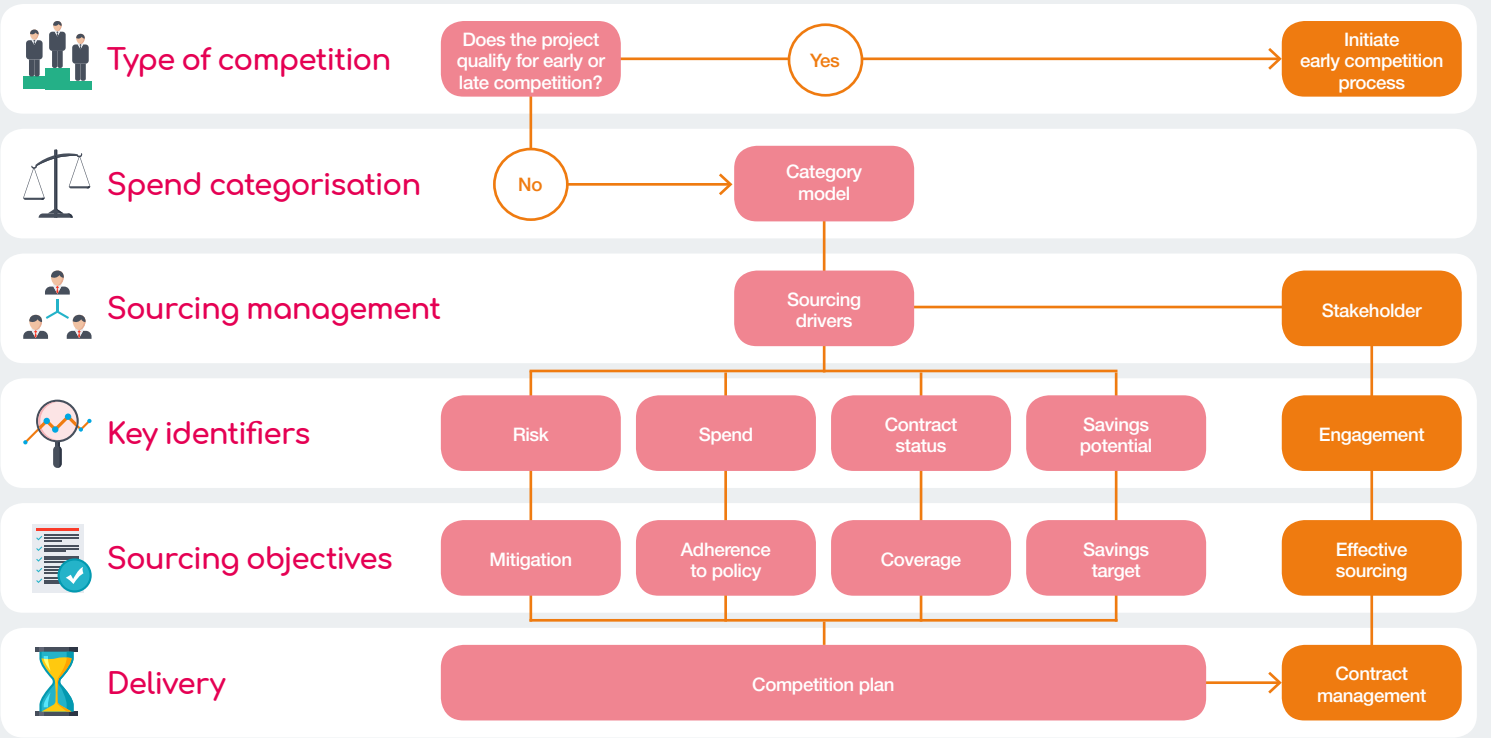
Project	Project value	New (complete new asset)	Separable	High value (>£50m)
Centre for the Protection of National Infrastructure Security	£15m	Yes	Yes	No
Enzen Support	£3m pa	No	Yes	No
Aerial Surveillance	£2m pa	No	No	No
Western Gas Alliance Contract	£60m pa	No	No	Yes

The key elements of our procurement strategy are as follows:

- We have an annual procurement plan (native competition) and run a programme of tender events to establish the correct mix of value for money, risk reduction, and fit for purpose solutions. This programme also ensures that an appropriate quality of goods and services are contracted.
- The process we undertake to create our competition plan is summarised in Figure 1 (overleaf). We have included the outcome of this process – our Native Competition Plan for GD2 – as **Appendix 10A.**
- Around 80% of the purchases we make are covered by contracts or framework agreements that we have run through this programme. This includes connections jobs and the reinforcement and diversions projects that exceed £50k. This approach goes above and beyond the minimum requirements of the EU Procurement Regulations.
- We have a policy requiring all remaining purchases over £5k to be market tested (where contracts or a framework agreement do not exist). We have an escalation process in place if market testing is not appropriate, which is signed off at Executive level.
- 100% of our above-threshold market testing is notified through either Achilles or the Official Journal of the European Union (OJEU).
- Where possible we use collaboration with other utilities and GDNs to increase market leverage, achieve lower costs, and to share best practice and innovations. In GD1, this collaboration has led to combined savings of £1.5m, on a £6.5m award value, with a 23%

Chapter 10. Using competition to deliver best value (continued)

Figure 1: Planning process to create our competition plan



saving. The full list of our collaborative tender events in GD1 is set out in Table 2 (overleaf).

- We have strong governance arrangements in place, including the use of supplier performance scorecards and our management of supply chain risk, via a detailed pre-qualification questionnaire for suppliers and the use of an approved vendor list (AVL).
- We focus on strategic, high-value, high-risk areas and use the best market intelligence we can to inform our analysis, identify trends and carry out benchmarking.
- Tender events are run when potential benefits are not outweighed by event costs. Decision making takes a holistic view to ensure that we meet the interests of all gas consumers.
- We follow procurement good practice with regards to stakeholder engagement. This includes within the business itself (to identify consumers' and stakeholders' needs) and through engagement with the supply chain. For example, in GD1 we held an event to consult with potential suppliers ahead of tendering our reinstatement work.
- As part of our commitment to ongoing transparency, in GD2 we intend to start publishing our annual above-threshold competition plan, which will reflect actual events. We will also publish the outcome of project awards, at the end of each year.
- Conflicts of interest are managed through a formal process for all tender events. Declarations from stakeholders are sought prior to the market being engaged.
- We use frameworks, innovation, partnerships, electronic catalogues and sourcing tools to encourage and foster competition.
- Our default approach is the Negotiated Procedure as defined in Articles 47 and 50 of the EU Procurement Regulations as this approach encourages competition and alternative solutions to be considered.

When market testing, we make sure that we consider the full range of quality/outputs/service and other regulatory requirements (such as those required by the HSE). In other words, we consider value to be about more than simply cost but to encompass aspects such as delivering excellent customer service, quality, reliability, sustainability and risk reduction. This is particularly pertinent in areas where procurement decisions can support and deliver the outcomes of our Environmental Action Plan.

The planning process covered in Figure 1 describes the process we go through to identify tender events that make up the Native Competition Plan. Our plan for GD2 is attached as Appendix 10A. In practice the plan is a rolling 18-month forecast of tender events that is refreshed every six months and reported to our Executive team.

Click **Appendix 10A** for our Native Competition Plan for GD2.

Chapter 10. Using competition to deliver best value (continued)

We also balance implementation and transition costs with future operational costs and residual values to make sure that whole life costs are considered in procurement decisions. Supplier solutions must be technologically agnostic to ensure open competition and uphold the principles of the EU Procurement Regulations. We will ensure that this continues by specifying outcomes and deliverables. We will also avoid brand specifications and any other limiting technological criteria in scope documents.

We carry out our market testing and purchasing activities through a directly employed procurement organisation. The efficiency of our award-winning team is evidenced by the use of external benchmarks, which have found our procurement expenditure to be "fair and reasonable" (ImprovIT & Alchemmy, 2018). We run all procurement events via an online portal for accessibility, automation of repeatable processes and to provide a robust audit trail. The toolset we use is considered upper quartile and best in class.

3. Benefits to date

The benefits for customers of our strategic delivery model can be judged by our outputs in the GD1 period to date. In summary, we have been able to:

- deliver 550 procurement events, bringing savings of on average 2.5% per year, against an average annual contract volume of 230 contracts;
- deliver environmental benefits from our supply chain;
- save £1.5m per year by collaborating with other UK utilities.

£1.5m

saved per year by collaborating with other UK utilities.

Table 2: Delivering savings through collaboration

Nature of contract	Year	Savings pa	Award value pa
Courier services and external mail	2014	£40,000	£133,000
Access covers and frames	2015	£1,300	£21,565
Meter cabinets and housings (non-domestic)	2015	£10,000	£79,000
Mobile communications	2017	£75,000	£275,000
PE pipe and fittings	2016	£644,000	£4,331,000
Stationery	2017	£19,000	£109,000
Purchase of mobile devices (WGA)	2017	£51,000	£85,000
Purchase of mobile devices (WWU)	2017	£345,000	£543,000
Customer satisfaction surveys	2017	£130,000	£80,000
Call handling	2013	£213,200	£846,213
Total		**£1,528,500**	**£6,502,778**

The efficiency of our award-winning team is evidenced by the use of external benchmarks.

4. Regional variance

Our network is unique in that it serves two countries with different governing bodies. As a result we often have to secure contracts that serve the requirements of those bodies. An example of this is the procurement of our road furniture signage which must be in the language appropriate to the region. While we clearly have to include the Welsh language on our signs, there are also separate requirements in North Wales and South Wales, meaning that securing efficient contracts can be challenging.

Our network is also unique in terms of its geographical layout. We have a number of extremity areas, such as Devon and Cornwall, Pembrokeshire, Anglesey and Mid Wales. Many of these areas have seasonal and variable populations as they are holiday locations; as such they provide challenges for recruiting contract labour, and labour rates can be higher. The transport links to these areas are also relatively poor, which in certain areas of our business pushes up rates.

As an example, the waste and excavated spoil removal costs in Devon and Cornwall are 50% higher than the average for the rest of our network.

5. Future plans

We are currently undertaking a substantial exercise to market test the full range of sourceable spend across the whole business.

Our delivery mix for GD2 will be determined by this market testing and will enable us to select the solution that delivers the best value and service for our customers. We made the strategic decision to carry out this exercise as our current delivery mix is coming under strain due to labour market pressures.

Our decision to carry out this level of market testing was informed by the successful market testing exercise of our large mains and services replacement work, which we undertook in 2007/08. The exercise led to the creation of an Alliance contract, which we judged would get the best value from cost and risk sharing. The contract included pain/gain terms that have delivered significant benefits for customers to date (by reducing customers' exposure to any cost overruns, and incentivising contractors to outperform, which also benefits customers in the long run).

Chapter 10. Using competition to deliver best value (continued)

6. Delivering value for money

Our cost profile

While the results of market testing and procurement have helped us to achieve significant benefits since 2005, the 'cost to serve' of our procurement team has also improved (see Table 3). For an average team cost of c.£800k, the team has been delivering c.£2m annually of cost avoidance through robust contracting.

The cost profile of our procurement activity has been generally reducing to a level where the cost to serve and the level required to ensure effectiveness and compliance have converged.

Mitigating rising market rates

Chapter 19: Workforce resilience sets out in more detail the issues that are leading to rising labour market rates. These include substantial infrastructure projects such as HS2 and Hinkley Point, with which we must compete in order to attract skilled labour. We have also experienced adjacent GDNs, which have struggled to achieve their programmes, being able to attract our resources by offering higher rates of pay.

To help mitigate costs from rising labour market prices we will continue to:

- capitalise on innovation within our own supply chain;
- prioritise our Native Competition Plan to ensure that we are responding to identified business needs, and market test on that basis;
- be agile and responsive, so that we are able to respond to changes in external conditions;
- collaborate with other utilities to improve our market leverage.

We vary our contract durations with suppliers to balance market conditions, supplier investment, price certainty and business continuity. Typical contract terms are three years with rights of extension. We do not commit to volumes and the vast majority of contracts are non-exclusive, allowing us to remain agile in dynamic markets and to protect customer interests.

We collaborate with other utilities to improve our market leverage.

An example of this is the contract with our odorant suppliers, where we have secured a contract rate for the supply of this product to our odourising facilities. This has protected us and our customers from a market rate increase for this product. Our procurement team has mitigated cost increases to below prevailing market rates.

We have also taken steps to encourage market growth and have engaged with Tier 2 contract organisations to work on specific programmes of work, such as mains reinforcement. This sort of work has been ideally suited to these types of organisations.

7. Governance

We have clear governance arrangements in place to mitigate risk and ensure best value.

These include the following processes:

- Compliance with EU Procurement Regulations.
- Periodic internal audits across our supply chain.
- Annual audits by our owner, the CKI Group.
- Monthly Purchase Order governance checks – ensuring compliance with the procurement policy.

The audits that are carried out assess our performance against our procurement policy and result in findings that are graded by risk value. All findings from audits are acted on and closed out as agreed with the auditing body.

An important focus for our procurement team is to ensure that the risk profile of supplier activities is managed and mitigated. Projects entailing greater risk are subject to higher levels of scrutiny. As part of this, we have used an approved vendor list and performance scorecards since 2013. All suppliers and providers on the list have met our minimum standards in terms of quality, HSE compliance, financial stability, and insurance coverage.

The scorecards we use are based on their strategic importance to our business and/or the contract value. They provide the mechanism for us to measure and report on performance against four areas of quality, cost, service and innovation/customer. Since their introduction the scorecards have led to improved supplier performance. We also use the scorecards as a record of past performance when evaluating new tender submissions from those suppliers.

Table 3: Procurement costs (GD1, nominal prices)[3]

£m	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Gross procurement costs	0.73	0.92	0.85	0.82	0.77	0.77	0.78	0.81
FTE as per section 3.1 2018/19 RRP	9	9	12	10	13	12	12	12

3 Initial costs taken from RRP as reported. Added back £0.1m per year of ancillaries to gross costs up. Accounts payable deducted from procurement figures in 2018/19 – 2020/21.

Chapter 10. Using competition to deliver best value (continued)

8. A good corporate citizen

Working in partnership to promote fair and ethical procurement practices.

Our procurement team understands its role in supporting local businesses and communities and in limiting the impact of our activities on the environment. We also recognise the influence the supply chain can play in meeting these goals. To ensure that we maintain ethical sourcing practices, the team captures and monitors a wide variety of supplier attributes through the pre-qualification stage of each tender and the supplier creation process for suppliers that ask to join our AVL. The types of data covered include compliance with legislation (anti-bribery, modern slavery, and financial standing) along with accreditations such as ISOs, Health & Safety, and environmental performance.

As part of working towards compliance with ISO20400, we make sure that we contribute positively to the businesses we work with and to the economy by making sustainable purchasing decisions and by encouraging suppliers and other stakeholders to do the same.

By virtue of the areas in which we operate we support local businesses and the vast majority of suppliers (98%) are UK based. We pay 99% of supplier invoices within 60 days, exceeding the Prompt Payment Code benchmark of 95%[4]. To support SMEs, our standard payment terms are 28 days following the month of invoice.

The key decision criteria in all of our tender events is based on the principle of most economically advantageous tender.

4 https://check-payment-practices.service.gov.uk/report/15244.

In practice this does not deliver the 'cheapest' offering, but considers a much wider range of factors (whole life cost, maintenance, disposal, recyclability, environmental impact etc) in a balanced view to get the best result possible for the business and ultimately the consumer.

9. External benchmarks

To test our cost to serve efficiency, we looked externally for appropriate mechanisms to benchmark our procurement activity. We have summarised below the findings from two independent benchmarks.

The Hackett Group's procurement benchmark empirically defines world class procurement performance on a balanced set of effectiveness and efficiency metrics.

External benchmarks

Benchmark	World class procurement	WWU procurement (as at June 2019)
Costs as % of spend[5]	0.6%	0.375%
FTE per £ billion of spend[6]	69 FTE	65 FTE
Savings as % of spend[7]	5.6%	6.5%[8]

We commissioned an independent value for money and effectiveness assessment of our back-office services, including in the area of procurement from ImprovIT & Alchemmy in 2018.

Click **Appendix 9I** for further information.

5 Hackett, 2018.
6 Hackett, 2012.
7 Hackett, 2018.
8 The equivalent score for our peers is 3.3%.

The review focused on totex for each service category, comparing the cost and staffing against the market by means of comparative analysis and a 'reasonableness' assessment. The analysis was of our procurement expenditure across 2017/18. The assessment report noted that "the level of staffing and cost presents fair value to WWU and its customers".

10. Our above and beyond approach

Our procurement strategy and supporting policy ensure that competition is embedded in the way we award work. They also ensure that suppliers are reputable and that our purchases are 'fit for purpose', technologically agnostic, and represent best value.

- The principles of the EU Procurement Regulations are equal treatment, non-discrimination, proportionality and transparency. These are applied to all procurement events – both above and below the EU threshold.
- The policy requires all spend to be exposed to competition above £5k – through either pre-negotiated contracts and frameworks or through a three-quote process for purchases between £5-£50k. Expenditure above £50k requires the involvement of the procurement team. This is above and beyond the EU Procurement Regulations.
- We operate an AVL to guide purchasers to the correct contracts and frameworks, and to ensure that health, safety and environmental risks are mitigated. The AVL performs other checks, including in relation to bribery, corruption and modern slavery, and ensures that there is adequate insurance coverage for the products and services provided.
- Our annual Procurement (Native Competition) Plan underpins the procurement team's activities. Our GD2 plan captures all elements of the tender events. This includes (but is not limited to) category of spend, business unit, sourcing strategy, saving type, contract terms, spend value, savings generated, supplier name(s), and contract type. The plan is focused on delivering value for money through: competition; risk reduction (via an extensive pre-qualification process); contract coverage (by including all of the goods, works and services required); and commercial security (through effective contracting processes).

Click **Appendix 10A** for further information.

- In GD2 we will publish our annual, above-threshold competition plan, showing actual events.
- Benefits to consumers are implicit in the delivery of the plan. Our approach to competition ensures that the vast majority of spend is market tested at least once in GD2. Our tenders are focused on delivering fit for purpose solutions that are safe, reliable, reduce risks and are selected under the principles of Most Economically Advantageous Tender (MEAT).

In summary, our procurement has been externally recognised by industry awards, has been assessed as 'world class' by three Hackett Group measures and evaluated as 'fair value' by an independent benchmark. It is the success of our procurement in GD1 that has delivered a track record of cost avoidance and contractual coverage – allowing us to maintain high levels of safety and customer performance, while ensuring that regulatory outputs are met.

Chapter 11. Our innovation strategy

1. Highlights of our plan

We have identified our strategic aims to 2050 and these align with what customers want and value from networks. We have determined our innovation focus areas for the 2020s, which build on the ENA's Gas Network Innovation Strategy (March 2018). These activities have been discussed and agreed with customers and have also been reviewed by the CEG.

- It is an extremely exciting time for our sector, with new technologies emerging and many opportunities being created to help our customers receive higher-quality services, lower bills and to meet the ever-increasing importance of delivering an environmentally sustainable network.
- Our strategic aims for 2050 reflect the outcomes that our customers and stakeholders have told us they want, including a safe and reliable service, environmental improvements, a sustainable energy source for today and the future, and support for our customers in vulnerable circumstances.
- We plan to invest £13.3m in high value innovation during GD2 using the reformed Network Innovation Allowance (NIA) funding. Both NIA and business as usual innovation will be delivered via open collaboration and partnerships, continuing the methods we adopted during GD1.
- We have a strong track record of innovation delivery and since 2013 have developed and embedded a culture that enables the organisation to innovate. We apply a framework for innovation to embrace change and roll out proven innovation into the business.
- Our approach for GD2 will see us build on our sector leading levels of partnership and collaboration – sharing expertise, solving challenges together and delivering successful projects.
- Key to our success will be the ability to monitor and measure the benefits of our portfolio and use innovation to support the delivery of a 0.5% efficiency (equivalent to c.£18m efficiency over GD2), as well as delivering long-term benefits such as our future of energy research.

Click **Appendix 13D** for our future of energy research.

2. Introduction

We have been committed to innovation since day one. This is led from the top by our leaders who believe that investing appropriate commitment and resources into innovation will help us improve our performance year on year. Our innovation team ensures that innovation is delivered at pace and that benefits are recorded and shared across all relevant parts of the business. Our investment in innovation is supported by our customers and stakeholders. They are keen to see us innovate across a broad range of our services.

Our innovation has delivered the following value:

- Improvements in safety, reliability and customer service.
- Providing real evidence of the way in which the gas network plays a critical enabling role in achieving net zero.
- A framework to roll out proven innovation – 78 projects embedded through our innovation programme have delivered overall cost savings or costs avoided to the value of c.£10m. These costs savings will continue into GD2.

Building on these GD1 successes we will continue to use innovation to create both transformational and organic improvements for our customers and employees.

Click **Appendix 11A** for our GD1 innovation track record.

3. What our customers and stakeholders told us

Understanding the needs and requirements of others has allowed us to work effectively in partnership to find solutions.

Customer and stakeholder feedback has helped us to develop an ambitious and sustainable innovation plan that delivers the services people want.

In summary, based on ten engagement events, involving over 20,000 stakeholders, it has become clear that they value innovation. They particularly value innovation that brings improvements in areas such as safety, reliability and decarbonisation. In direct response to this, we will continue to use innovation to develop new sustainable technologies, products and equipment that minimise the need to excavate, allow us to return customers back to gas quickly when they have been disrupted, and support the mains replacement programme.

It was suggested to us that there was a lack of visibility around innovation in the gas industry, so we have raised the profile of our work in this area more actively and are now an anchor company for the Welsh Government, promoting open innovation in Wales.

Our plan has benefited from the input of wide-ranging partners through our joint contributions to the ENA's Gas Network Innovation Strategy (March 2018). The Energy Innovation Centre (EIC) has undertaken an extensive programme of engagement on our behalf. It provides access to an ever-growing innovation community that currently stands at over 7,100 individuals and 5,700 unique companies.

We are active members of the Welsh Highway Authorities and Utilities Committee and consult with them on our innovation priorities. Engagement in 2018, for example, indicated that their priorities for innovation included minimising excavation of the highway, and locating and avoiding underground apparatus. This is an area of focus for us in GD2 as a result.

In terms of measuring the benefits of innovation expenditure, we have received strong support from wide-ranging stakeholders for the new framework we have been developing. Engagement on this subject has taken place through the EIC, with Ofgem's innovation team, and more widely with organisations such as BEIS, Sustainability First and Ofwat.

The CEG has challenged that our innovation portfolio was too heavily focused on technical engineering and lacked consideration of customer service and vulnerability innovation. In response to this, we have widened our portfolio, while also responding to Ofgem's guidance to invest in innovation to support those living in vulnerable circumstances. The group also challenged us about the extent to which innovation is embedded within our business.

Chapter 11. Our innovation strategy (continued)

We have updated our business plan to more clearly demonstrate how innovation has enabled, and will continue to enable, the delivery of many efficiency savings, service improvements and other benefits.

Looking ahead we are engaging in a regional initiative 'Co Innovate', embracing open innovation to scope five common challenges across a range of sectors. This will develop new solutions, create a strong network, and share insights.

Engagement informing our commitment

Our commitment

Continue to invest in innovation, working with around 500 external organisations during GD2 (compared to 350 in GD1) and sourcing over 50% of our ideas from outside our business.

The benefit of collaborative work in this area has been made very clear to us by stakeholders. We have collaborated significantly in GD1 and will continue to do so in GD2.

In our consultations with nine experts, it was highlighted that increased collaboration on innovation could open the door to several operational improvements and assist decarbonisation initiatives, while helping to keep customers' bills as low as possible.

This commitment was given an average level of importance compared with the other commitments, according to our latest round of acceptability testing. In general, there was limited support for continued investment in innovation, although SMEs in Wales with over 250+ employees rated this higher than the average.

Some of our customers thought that working with 500 external organisations over GD2 is overly ambitious and suggested we focused on quality rather than quantity.

We acknowledge all the feedback on this commitment. However given the positive impact innovation can have on safety, efficiency and sustainability levels, and the benefits we derive from significant collaboration, we will still maintain an ambition to work with 500 organisations, ensuring a focus on quality at all times.

Click **Appendix 5F** for detailed information about our engagement.

Click **Appendix 11B** for feedback from our SME community.

4. Our 2050 strategic focus

Using innovative solutions to become more efficient and reduce costs.

We plan to use innovation in GD2 to help us move closer to delivering our strategic aims for 2050. We will build on our processes, frameworks, networks and lessons learned to make sure that we unlock the full benefits of innovation projects that have been implemented in GD1.

Our strategic approach to innovation activities are categorised according to Ofgem's three output areas and information about them is presented in the following six pages.

For each of the three Ofgem areas we present:

- **Our ambitions** – a graphic illustrating our approach over the next three decades to 2050 built from the industry's strategic direction.
- Our plans to meet these challenges through **business as usual innovation** and NIA funded innovation for projects that we will deliver in GD2.

In light of the successes in GD1, we would like to see the final NIA scheme details closely aligned to the existing GD1 funding scheme. In return we will make a 10% compulsory contribution, deliver a high reward innovation portfolio, maximise collaboration opportunities, deliver a business-led programme using third party innovators, and monitor, track and report innovation spending and benefits.

- In our plans we are making a clear distinction between NIA and BAU innovation (see tables on pages 95, 97 and 99). We will fund lower risk projects that deliver short-term financial efficiencies as BAU innovation. These projects will be self-funded. We will use NIA funding primarily for more speculative, higher risk small-scale projects that deliver benefits in the longer term or where the benefits are not directly related to our business.
- During GD2 we propose to invest ► £13.3m (equivalent c.0.3% of revenue) of NIA funded innovation. We are seeking £12m to fund third party innovators for the identified project themes and £1.3m to finance the cost of the delivery team. We want to access this funding on a 'use it or lose it' basis across the GD2 period.
- While NIA innovation will focus on speculative research and development projects, BAU innovation will focus on deployment of solutions for the business. BAU innovation is likely to be the predominant contributor to the financial value that will be unlocked in GD2. We have set a challenging target of £18m in efficiency savings, while also delivering substantial societal and environmental benefits for customers and businesses. This represents a doubling of the innovation savings that we have achieved in GD1.
- We propose that the existing contribution levels and IPR arrangements are maintained for projects relating to vulnerability and energy system transition.
- Our programme includes: work with existing partners; work we will undertake to leverage new partnerships; work we will conduct with other networks; and work led by others that we will adopt for our own networks.
- We will continue to build on the good practices and working relationships established between networks. We have processes to avoid duplication and disseminate project learning using meetings, project logs, reporting protocols and events.
- At this time, we have not identified a need to use the new funding mechanism for roll-out of a specific proven innovation. However, we plan to re-assess this position during the course of GD2 with Ofgem.

Chapter 11. Our innovation strategy (continued)

Meeting the needs of consumers and network users

Meeting the needs of consumers and network users – strategic aims

CVP

Benefiting society and communities by developing bespoke and tailored services that meet the needs of our customers.

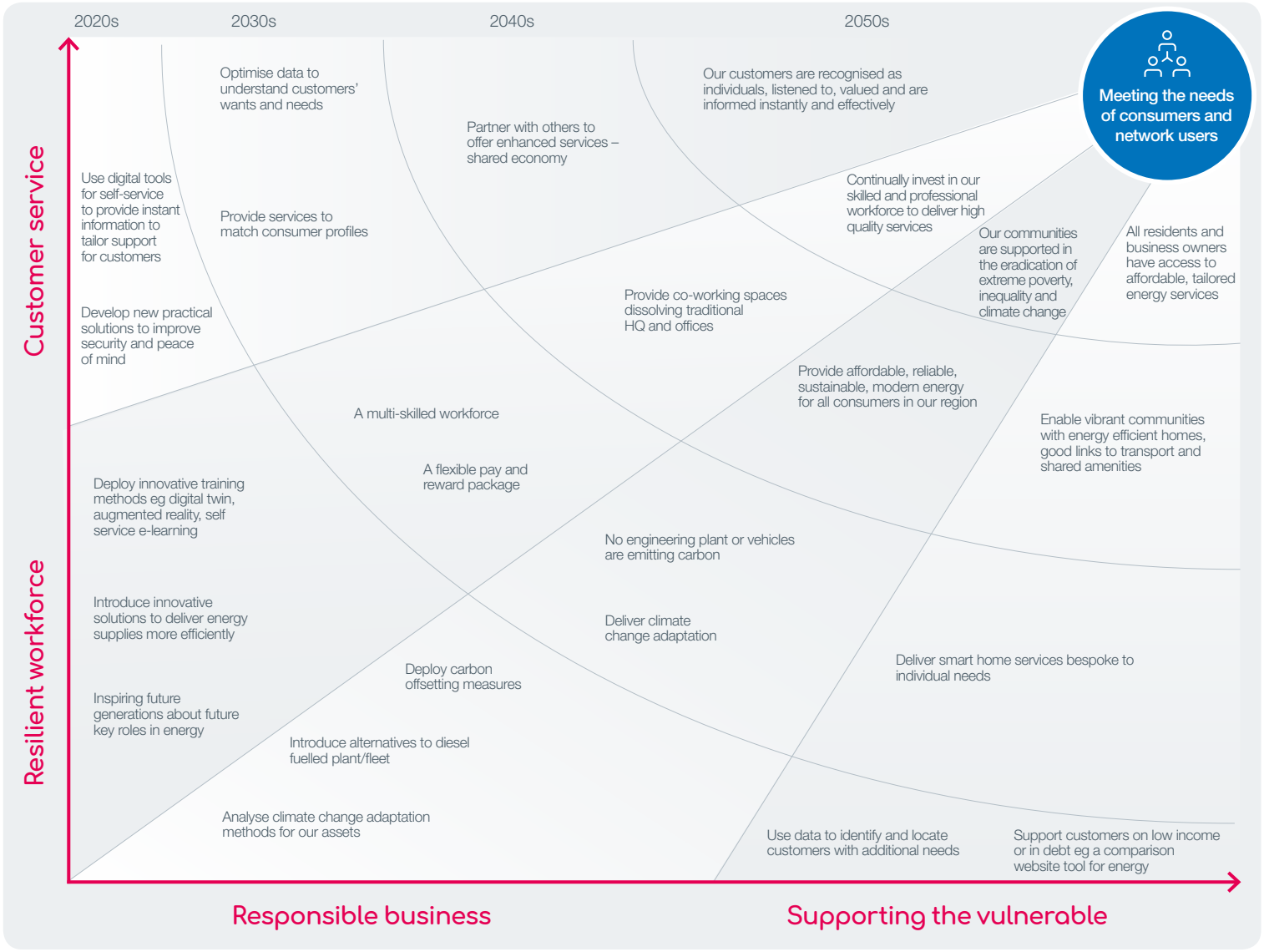
Between now and 2050, we will use innovation to support the provision of tailored services to all our customers, including those in vulnerable circumstances, and to ensure that we are a resilient business, as well as environmentally and socially responsible. We will deliver value adding projects aligned to Ofgem's Vulnerability Strategy and the outcomes of Sustainability First's Project Inspire. We will use NIA funding to support projects that bear uncertainty or where benefits are valid to society but difficult to commercialise.

Click **Appendix 11C** for the Project Inspire summary report.

Although future customer service requirements are difficult to predict, we know customers want a high-quality, inclusive, affordable and environmentally friendly service. The following pages show how successful innovation will deliver our strategic aims (also detailed in Section B of this business plan).

CVP

For every £1 invested in NIA for vulnerable customers, we will deliver £1.45 of net value to customers.



Chapter 11. Our innovation strategy (continued)

Meeting the needs of consumers and network users

						Consumer benefit					
Theme	**Our ambition**	**Focus area for funded projects**	**Focus areas for BAU projects**	**Projected project expenditure (£m)**	**Funding justification**	**Safety**	**Service**	**VFM**	**Reliability**	**Sustainability**	**Click for further info**
Customer service	Develop new solutions to improve service, security and peace of mind for our customers.	– Discover new technology to protect customers during loss of supply. We want to provide hot water for drinking and washing when a gas supply is interrupted eg more than a hot plate. We want to drive improvements to alternative heating methods when a supply is interrupted eg more than a temporary electric heater. – Design studies and trials of appliances and sensors for customer safety in the home.	– Deploy 24/7 customer service tools – serve myself, eg What is going on in my street? Where is my engineer? 24/7 chatbot services. – Formulate coordinated solutions for universal PSR and social media awareness campaign. – Shape new services and methods of communicating with multi-lingual customers and individual needs. – Initiate full use of digital tools for self-service, providing instant information and tailored support for customers.	£0.4 to £1	To progress and adopt technologies that provide better services to those affected by our planned and unplanned works.	✓	✓	✓		✓	**Chapter 6** **Chapter 7**
Resilient workforce	Develop and invest in training to deliver a skilled and professional workforce for the highest quality services.		– Deploy innovative training methods eg digital twin, augmented reality, self-service, e-learning. – Introduce innovative solutions to deliver energy supplies more efficiently. – Inspire future generations about future key roles in energy. – Train employees to recognise and support vulnerable customers.	No additional funding requests.	We will deploy proven innovative solutions and work with third parties to deliver these initiatives.	✓	✓	✓	✓	✓	**Chapter 19**
Responsible business	Reduce our negative impact and increase our positive impact on the environment.		– Deploy carbon offsetting measures. – Introduce alternatives to diesel fuelled plant/fleet. – Analyse climate change adaptation methods for our assets. – Improve coordination between utilities and highway authorities and new ways of providing information to road users. – Support resilient community energy programmes.	No additional funding requests.	We will deploy proven innovative solutions and work with third parties to deliver these initiatives.		✓	✓	✓	✓	**Chapter 14**
Supporting the vulnerable	Develop solutions to help our customers in vulnerable situations.	– Using data and analytics to identify and locate customers with additional needs.	– Grow and maintain networks to help promote and recruit to the PSR. – Jointly work with partners and care professionals. – Trial tools to support customers on low income and in debt.	£0.2 to £0.4	Investigate, develop and trial solutions to improve identification of vulnerability, solutions to support those with affordability issues.	✓	✓	✓	✓		**Chapter 6**
		NIA funding requested to meet the needs of consumers and network users		**£0.6 to £1.4m**							

Chapter 11. Our innovation strategy (continued)

Delivering an environmentally sustainable network

Delivering an environmentally sustainable network – strategic aims

Using innovation to minimise cost and reduce our carbon emissions.

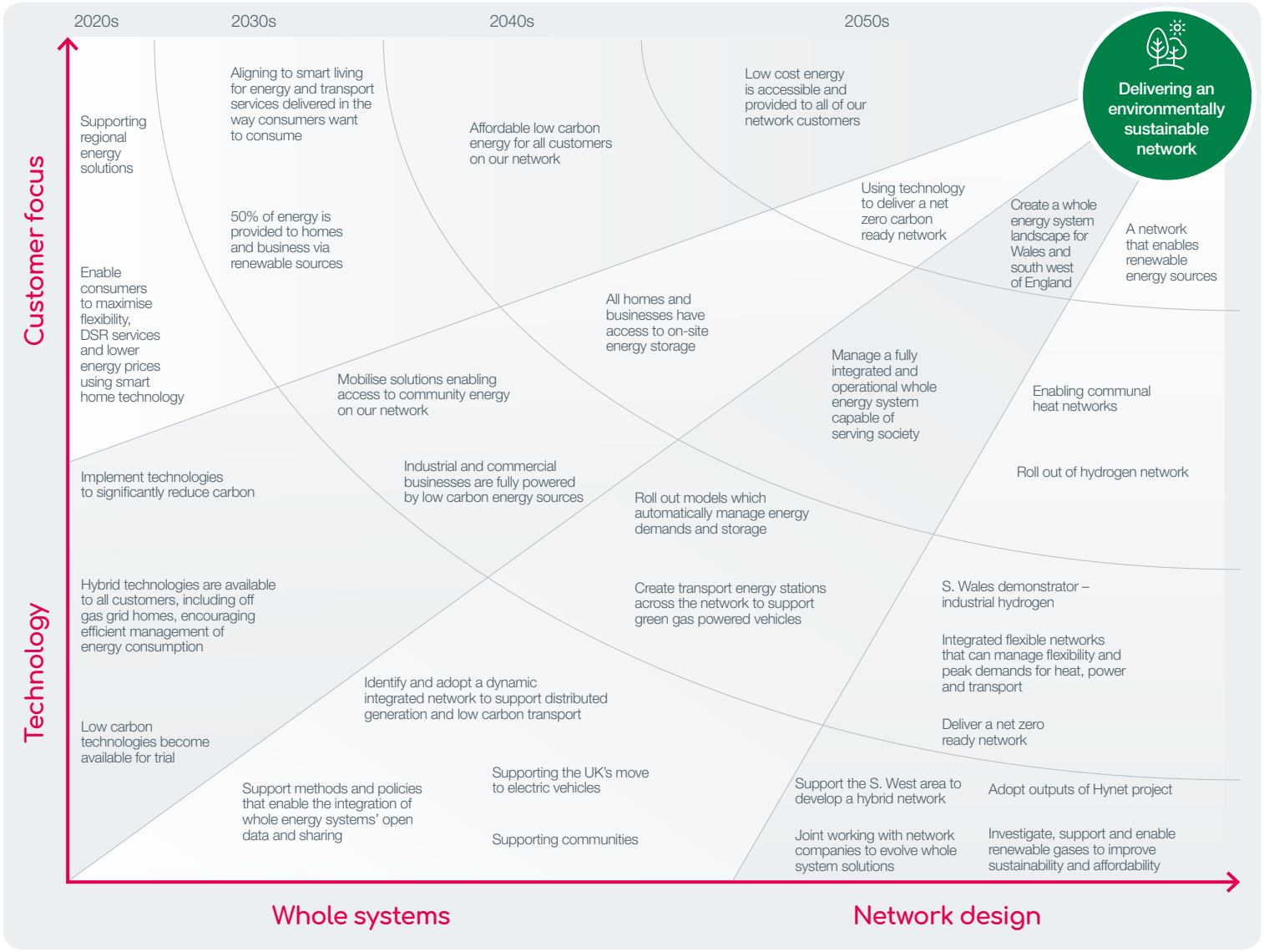
Our 2050 strategic aims in this area are centred on the steps needed to deliver a net zero ready network by 2035, providing more from our current network to the homes and businesses that rely on us in their daily lives.

Our network facilitates secure and resilient energy for heat, power and transport and enabling cleaner, greener energy is central to our ambition. NIA funding will be used to support the projects that will deliver customer benefits and provide the lowest cost pathway to heat decarbonisation. It will also build on our excellent record of research, demonstration and engagement in GD1.

BAU projects will support some regional energy solutions, trialling and implementing proven innovation from elsewhere and seeking new collaborative partnerships. Future projects will focus on decarbonising heat, power and transport in our region and will enable us to fulfil our net zero ready ambition.

CVP net zero

The £10m future of energy innovation investment will produce an NPV benefit of £39m in GD2 and £446m out to 2050.



Chapter 11. Our innovation strategy (continued)

Delivering an environmentally sustainable network

						Consumer benefit					
Theme	**Our ambition**	**Focus area for funded projects**	**Focus areas for BAU projects**	**Projected project expenditure (£m)**	**Funding justification**	**Safety**	**Service**	**VFM**	**Reliability**	**Sustainability**	**Click for further info**
Customer focus	Deliver low cost modern energy services to allow customers to use energy in the way they want to use it.	– Trial home 'smart' assets and methods that provide greater customer transparency and control of energy consumption. – Develop and demonstrate low carbon technologies. – Identify novel future commercial arrangement opportunities that reflect changes to energy supply methods.	– Discovering novel technical and commercial solutions to meet peak demand alongside industry. – Supporting regional energy solutions. – Responding to changing customer needs. – Supporting energy solutions for rural off grid areas.	£1 to £3	To discover how new solutions can benefit customers, to progress technology development and demonstration further than we know today.	✓	✓	✓	✓	✓	Chapter 13
Technology	We want to maximise the adoption of technology that can demonstrate flexible, cross vector or low carbon technologies.	– Introduce AI solutions. – Test new equipment to facilitate unconventional gas connections to the networks. – Discover new market developments to achieve net zero. – Investigate alternative gas blending, deblending, monitoring and safety systems. – Develop demand models that better predict peak/off-peak demand for short and long term planning. – Pilot technology for day to day management and meeting changing customer requirements.	– Implement and demonstrate technologies that significantly reduce carbon from manufacturers or as a result of collaboration with other networks. – Work with regional bodies to support the availability of low carbon technologies to all customers, including off gas grid homes, encouraging efficient energy management and consumption. – Find novel ways of clustering low carbon technologies for maximum effect.	£1 to £3	Work with third parties to develop and trial new technology to prove the benefits that they can offer to deliver a net zero network.	✓	✓	✓	✓	✓	Chapter 13
Whole systems	We want to deliver whole systems solutions that enable no build options both within and outside of our geographical region.	– Support methods and policies that enable whole system data and sharing. – Develop customer portals for data sharing. – Identify and adopt potential whole system solutions.	– Develop and maintain our whole system modelling services using Pathfinder. – Develop new processes to manage the impact of operating a more dynamic gas system. – Support communities to design and develop diverse and de-centralised local decarbonised energy solutions. – Use our network to support the UK's move to low carbon vehicles.	£0.5 to £1.5	Finding and proving solutions that can deliver the UK vision for a joint and integrated energy network.	✓	✓	✓	✓	✓	Chapter 13
Network design	Implement the technology, methods and policies to deliver a net zero ready network by 2035.	– Experiment with future network design options. – Investigate optimised storage and system flexibility options. – Encourage new methods of carbon capture and storage at point of supply or point of use. – Support national projects investigating hydrogen deployment. – Drive novel ways of integrating networks eg gas, water and electricity. – Increase the use of connected, real-time data when operating the network. – Discover new tools for the control room to manage new requirements. – Develop solutions for biogas and/or hydrogen filling stations.	– Support and enable renewable gases to enter the network. – Seek collaborative partnerships with network companies to evolve our existing networks. – Implement a hybrid and optimised network solution within the south west area and Wales. – Enable the NW England extension to N Wales of blended hydrogen (ref Cadent Hynet project). – Work collaboratively with stakeholders to design energy solutions for heavy industry.	£2.5 to £7.5	This funding will build on current GD1 research and focus on developing the solutions that can be deployed for future trials to evaluate the true benefits for customers.		✓	✓			Chapter 13
		NIA funding requested to deliver an environmentally sustainable network		**£5 to £15m**							

Chapter 11. Our innovation strategy (continued)

Maintaining a safe and resilient network

Maintaining a safe and resilient network – strategic aims

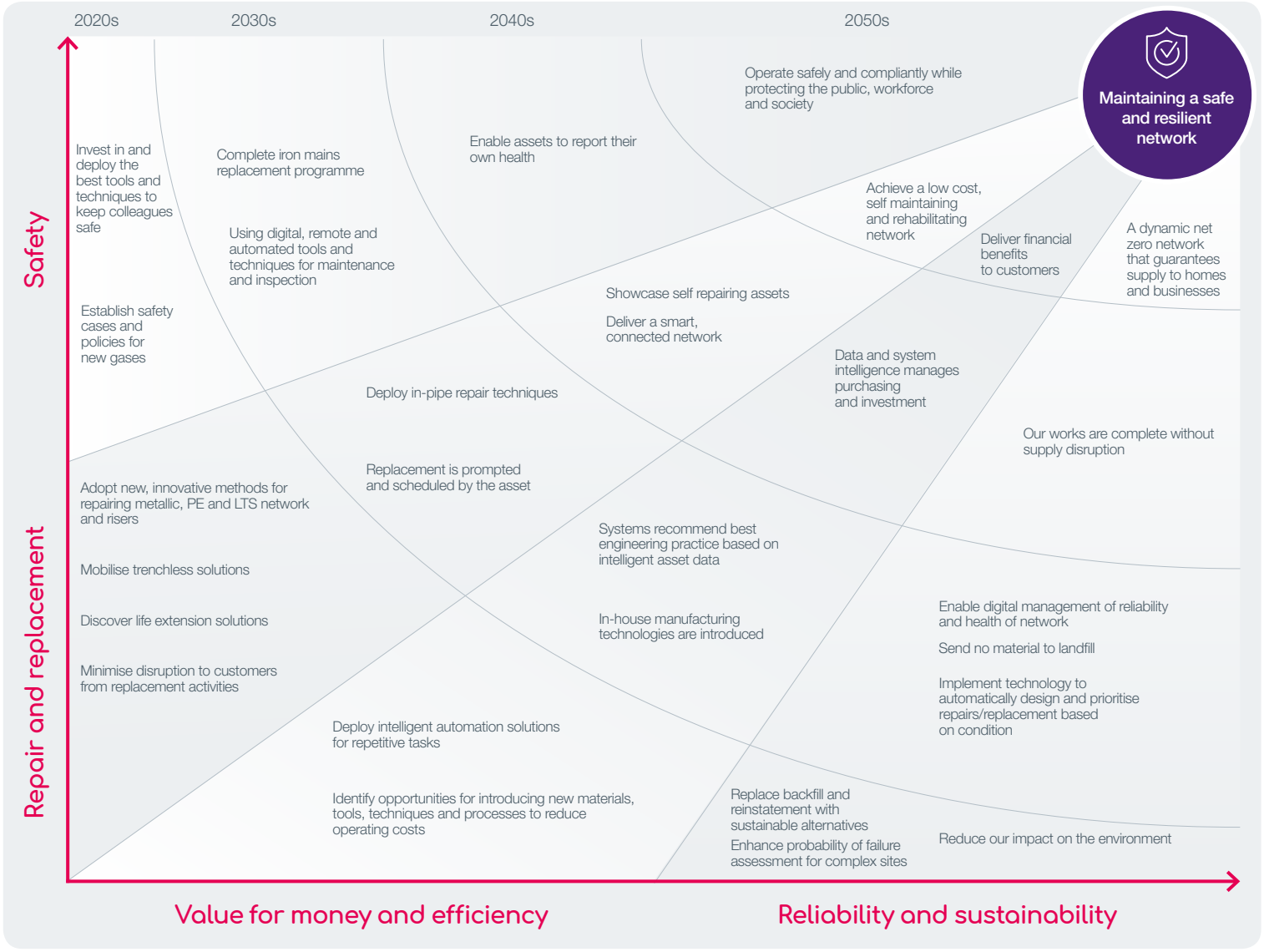
Using innovation to reduce costs and maintain the safety of our network.

We will use innovation to help us manage and maintain our network, at lower cost, to support our excellent safety record, and to ensure a reliable and resilient supply. We will make the most of emerging technologies and new products and techniques that will help minimise the physical aspects of our activities and therefore any disruption to customers, and improve the data we have about our network.

This includes creating a safe and resilient network for power and transport networks where the gas network underpins the growth and success of renewable technologies.

NIA funding will be used to support projects that help our business to adapt to a changing environment – one that will be fit to provide energy for generations to come. For example, we will experiment with remote and automated tools for inspection and repair, set an industry ambition for untethered in-pipe robotics, discover new materials, and trial real-time data and effective data management systems.

BAU projects will support solution trials and implement proven innovation from elsewhere. We will work closely with third parties and the other gas networks in this grouping to maximise collaboration, sharing the costs and benefits of these initiatives and stimulating new markets.



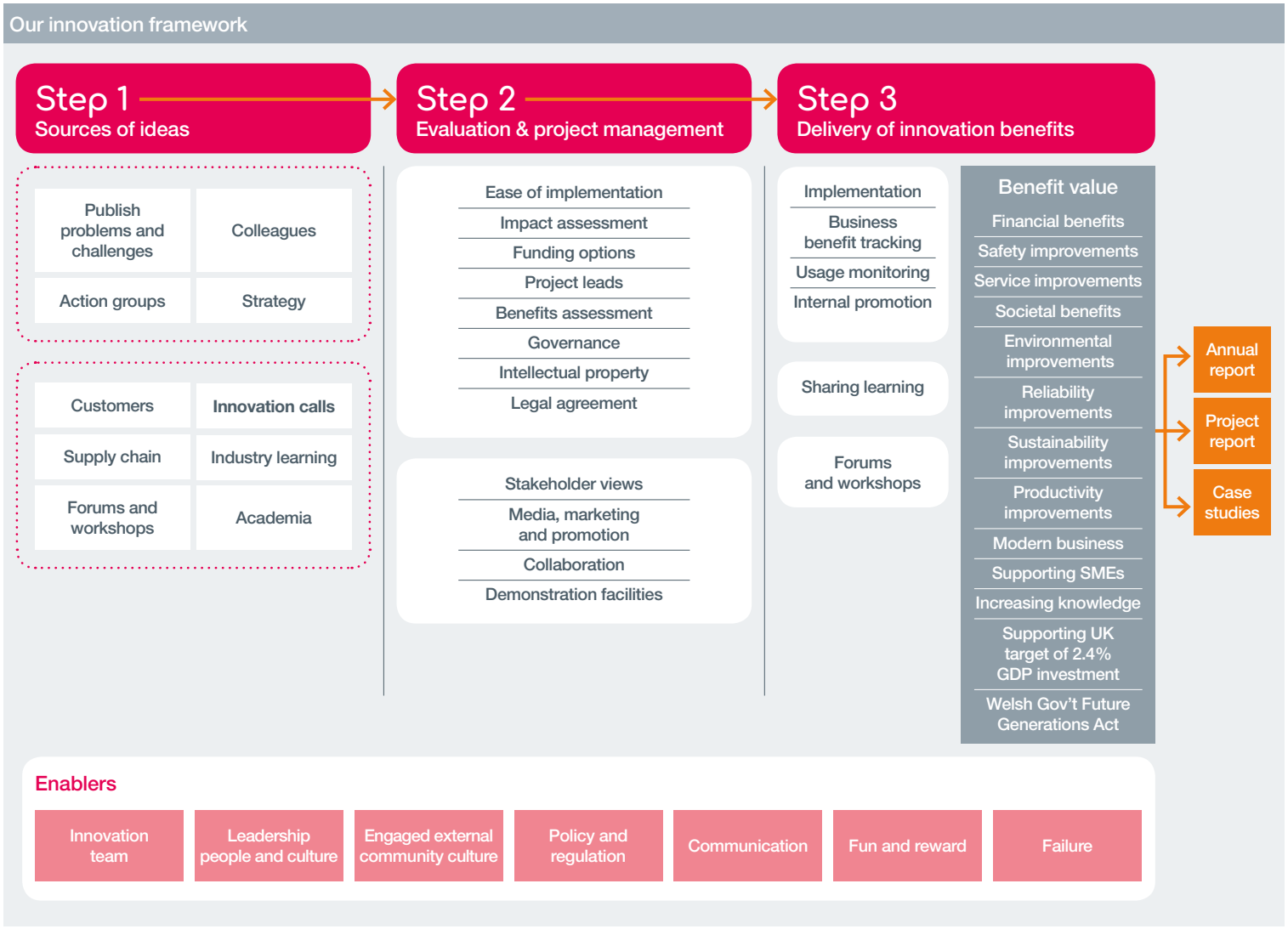
Chapter 11. Our innovation strategy (continued)

Maintaining a safe and resilient network

						Consumer benefit					
Theme	**Our ambition**	**Focus area for funded projects**	**Focus areas for BAU projects**	**Projected project expenditure (£m)**	**Funding justification**	**Safety**	**Service**	**VFM**	**Reliability**	**Sustainability**	**Click for further info**
Safety	Continue to operate safely and compliantly while protecting the public, workforce and society.	– Develop remote and automated tools for inspection and survey. – Use available data in new ways – AI. – Investigate new technologies and services for gas escape management.	– Trial crash avoidance technologies for vehicles (eg reversing grab hiab contact with overhead lines). – Progress GPS live location and calibration tracking for resources eg plant and equipment. – Continually introduce tools and techniques to improve delivery of the iron mains replacement programme. – Create dashboards and intervention levels – Legacy PE condition and failure. – Investigate AC mitigation for pipelines.	£0.1 to £0.3	To progress and adopt new technologies that help us take regular assessments of the health of the network and repair remotely to improve safety of public and employees.	✓	✓	✓		✓	**Chapter 16** **Chapter 18**
Repair and replacement	Develop and trial products, equipment, technologies and methods to maintain, repair and replace our network at low cost with minimal human intervention.	– Design large diameter and 75mbar – 2bar pipe repair methods to improve safety for operatives. – Discover untethered in-pipe robotics to inspect and repair. – Shape innovative LTS network, riser and pipe repair methods. – Seek zero customer interruption mains replacement techniques. – Progress development of sensors and a connected network.	– Build on riser lining systems developed in GD1. – Explore data requirements to manage just in time maintenance. – Exploit trenchless technologies and develop WWU action groups to create new solutions that minimise excavations.	£0.2 to £0.6	To develop new solutions for repair and replacement that will avoid unnecessary capital investment, maximise asset life extension and minimise disruption to the public.	✓	✓	✓	✓	✓	**Chapter 16** **Chapter 18**
Value for money and efficiency	Innovate to improve data, systems and technology solutions to deliver the most effective and efficient decisions in terms of timing and optimal solutions.	– Create advanced manufacturing solutions for bespoke fittings and fast prototyping. – Enable a smarter network across pressure tiers for real-time decision making. – Seek data and systems intelligence for optimum record keeping and data sharing initiatives. – Discover life extension solutions.	– Further develop data and systems to recommend best practice and maximise roll-out to business as usual. – Develop and use automated processes (RPA) for repetitive tasks. – Develop the skillsets of our operatives to avoid unnecessary intervention and therefore cost. – Challenge third parties to innovate to avoid cost increases on repex programme. – Managing new streetworks legislation in day to day operations. – Facilitate drone flights.	£0.05 to £0.2	Encouraging other sectors to innovate with us to deliver a network that is fit for the future, low cost, safe, reliable and efficient.		✓	✓	✓	✓	**Chapter 16** **Chapter 18**
Reliability and sustainability	Protecting the environment and safeguarding supplies to homes and businesses in anticipated and unanticipated events.	– Find solutions to reduce emissions not relating to mains and services. – Pilot schemes to reduce our impact on the environment. – Prioritise repair/replacement based on data sources using novel methods and technology. – Pilot AI, data and system intelligence. – Investigate enhanced Probability of Failure (PoF) assessment for complex assets to improve reliability and 'just in time' investment decisions. – Shape resilience solutions for a changing environment.	– Explore how technology can help us manage, maintain and repair without impacting on excellent safety performance or reliability. – Research and develop how we can best manage assets that are nearing their end of life. – Discover ways to gather information on how assets fail, when they fail and what the causes of failure will be. – Identify alternatives to landfill. – Reduce virgin aggregate usage.	£0.15 to £0.4	Seeking sustainable alternatives to traditional methods wherever possible. Delivering a low cost network that supports our stakeholders' environmental ambitions.	✓	✓	✓	✓		**Chapter 16** **Chapter 18**
		NIA funding requested to maintain a safe and resilient network		**£0.5 to £1.5m**							

Chapter 11. Our innovation strategy (continued)

5. A framework for innovation



Step 1: Sources of ideas

To identify solutions to our challenges and problems we work with wide-ranging stakeholders, including customers and supply chain partners, and we engage with them through forums and workshops. Partnerships within and beyond the gas industry enable us to share expertise, access funding and unlock potential for delivering newer and better services as well as preparing for future risks. As part of this process we look for opportunities to build on past projects that we and other networks have completed, thereby making the most of lessons learned.

Internal and external sources: Ideas are presented to us in a variety of ways (with 50% of ideas coming from outside the business). We have a portfolio of 16 academia-driven projects delivering research for real industry challenges – ranging from short durations to three-year PhD qualifications. Initiatives to encourage our own colleagues to bring forward ideas include open innovation ideas inbox, our Young Persons Network Beermat competition and our Customer Service Championship Cup.

Open Innovation programme: Our strategy to make connections with leading innovators will continue as we believe that third party involvement is a key enabler of innovation. Starting in 2013, we have formed 350 unique partnerships from across 18 different countries. These partnerships enabled us to invest in 250 BAU and NIA projects. We aim to form 150 new partnerships during GD2. Attaining this target will be a challenge and we will focus on this commitment by participating in network forums, dissemination events, workshops and action groups. We will also promote the gas network innovation strategy to communicate our problems and challenges widely and to encourage innovators to connect with us.

Chapter 11. Our innovation strategy (continued)

In response to CEG and stakeholder feedback that questioned whether working with so many partnerships could be fully effective, we will focus on developing deeper relationships with key innovators, as well as increasing our reach. One of the ways in which we will do this will be to first identify the type of organisation we plan to work with, then engage with those organisations in a more meaningful way.

Step 2: Evaluation and project management

Evaluation criteria: We exercise robust governance in selecting and delivering innovation projects. We want to make sure that every project we select has the potential to provide real benefits to customers and that we understand the project's impact before it is embedded within the business. This includes assessing any potential impacts on vulnerable customers.

Our processes encourage colleagues to bring forward innovative ideas, and in order to optimise a successful implementation and roll-out we ensure that each project has a lead from within the business.

Governance and risk management: When allocating finance for projects we make sure that we optimise collaboration opportunities and manage project risk and expenditure. We use a stage gate system, critical milestones and clear decision points that allow us to sever projects that are not delivering as anticipated. The centralised team uses the innovation toolkit to move each project through the process effectively and with pace. The team also reports progress appropriately to Executive leads and collaborative project teams. The toolkit was developed in response to lessons learned during GD1 and is accredited by the Welsh Government's SMART Innovation Programme.

Click **Appendix 11D** for a review of our innovation process.

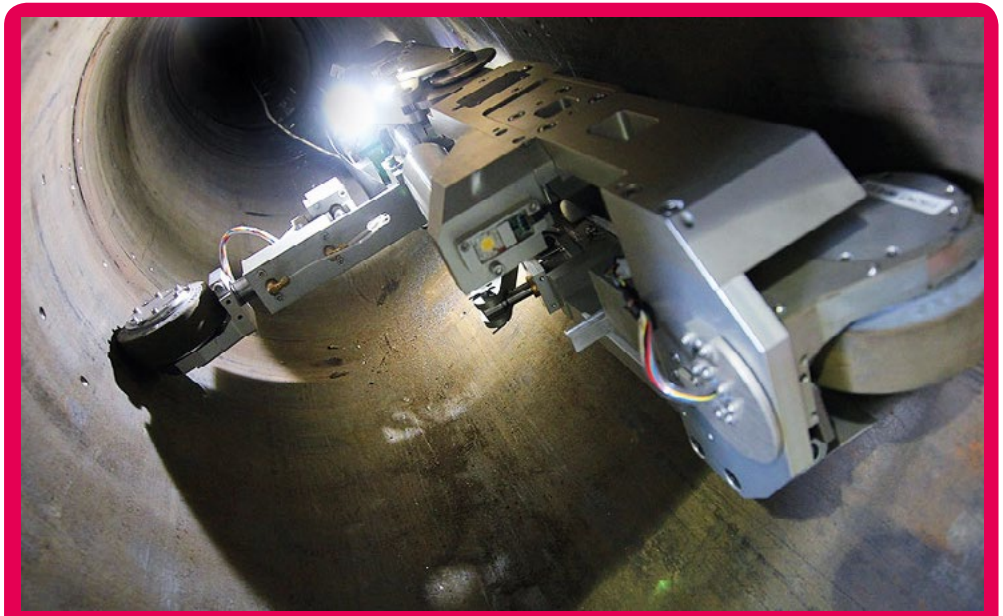
We will target connecting with 500 partners by the end of GD2.

Our processes encourage colleagues to bring forward innovative ideas and optimise a successful implementation and roll-out... we learn lessons from past projects.

Feedback loop: Not all projects will deliver a successful outcome. As a general rule of thumb, for every 50 ideas, 10 will become live projects and only two will be great successes.

In GD1, 36 projects were not taken forward. For example, a ground-breaking idea may not work in practice, an issue that affects another GDN is not a problem we need to solve, or our methods are cheaper in reality than it would be to use the innovation (see CISBOT case study).

Our processes to learn lessons include an external cross-section review process that we initiated in 2016 and plan to repeat. Here we worked with other GDNs to identify common issues and learnings.



Assessing innovation: CISBOT

CISBOT is an NIA project led by SGN. It involves using a robot to repair large diameter mains by travelling along the pipe, then injecting a joint sealant to stop it from leaking.

We undertook analysis to compare the cost of using CISBOT to make a repair with the cost of replacing the pipe via insertion. Insertion is a method we use whereby a plastic main is inserted into the main that is leaking. We found that it was considerably cheaper, by £162,000 (or 45%), to insert a new main than to repair it using CISBOT.

We understand that in some locations CISBOT may be a better option (for example if the network includes many busy high streets where repairing with CISBOT is less disruptive for customers than inserting a new main). However, given the current cost discrepancy in the two approaches its use would not be a viable alternative for our network in practice and the pipe would still need to be replaced at a later date.

Using innovation to minimise costs and maintain the safety of our network.

Chapter 11. Our innovation strategy (continued)

Step 3: Delivery of innovation benefits

We aspire to deliver continual year on year growth by embedding innovation to support the delivery of c.£18m of efficiencies over GD2.

Benefit tracking: There are a number of challenges associated with measuring the outcomes from innovation. Many outcomes, such as cultural shifts, are difficult to quantify. Until now we have measured the benefits of our investment in financial and non-financial terms using our tracking tool, which we have shared with the gas networks.

Innovation measurement framework: More recently we have successfully trialled a balanced scorecard framework, developed with network partners, to robustly and independently measure sustainable innovation. This allows us to forecast the GD2 end position, as shown opposite.

Click **Appendix 11E** for the detailed innovation benefit analysis.

The framework has received support from all gas and electricity networks, and from stakeholders including BEIS, Citizens Advice, Sustainability First, Ofwat and Energy UK. Ofgem feedback has also helped to develop the measurement framework further. Going forward, we will continue to develop the report and will include it in our annual innovation report.

Our BAU project Duraseal has been used over 65 times since its roll-out in 2018, helping engineers to make repairs without isolating customers' supplies.

The innovation measurement framework

	Initiation and evaluation (ideas)	Demonstration, iteration and learning (trials)	Deployment and optimisations (build)
Strategy and vision	A strategy is in place for WWU innovation 92–101	Extent to which the strategy focuses on improving the areas of service value Reliability Value for money Sustainability Customer service Safety	100% Extent to which innovation trials align with the strategy
Organisation and culture	200 External parties involved	Focus of projects and funding by TRL 65% External 85% Internal 4 FTE core delivery team	£12m NIA spend on innovation projects
Capability and technology	575 Total number of ideas generated	Focus of projects and funding by TRL 98% of funded projects will focus on TRL <6 88% of projects costs will focus on TRL <6	90 Average days to deploy innovation to BAU
Results and outcomes	25% % of innovation ideas taken forward	£18m Net benefits forecast from mature innovation 40% % of TRL projects 2-6 leading to follow-on project £39m CVP value	26% % of TRL 8 projects moved in to BAU

Chapter 11. Our innovation strategy (continued)

Implementation: We are committed to rolling out innovation that has been trialled by us or other companies. We have built a strong innovation operating model (our 'Innovation process toolkit') that uses a range of tools and techniques that produce clear project strategies and plans, engages stakeholders in our vision, encourages project success, and supports the roll-out of equipment, products, research findings and procedures.

78 projects

rolled out into the business. Improving safety, reliability, service and the environment.

In GD1 some 78 projects were rolled out to business as usual. These projects improve safety, reliability and service and are better for the environment (see the gasholder sludge case study opposite).

The benefits of previously proven innovation are reflected in our future expenditure for activities such as, for example, riser replacement using new PE systems and 500m coil trailers that reduce PE wastage on mains replacement schemes.

Click **Appendix 11F** for a full list of implemented projects.

Shared learning: We are at the forefront of sharing our learning with other companies and interested bodies through network forums and dissemination events. We participate and lead in national industry forums regarding our evidence to support the future direction for low carbon energy. We are proud to be sector leading in our levels of collaboration, at 68% compared with the sector average of just 23%.

Furthermore, our collaborative drive has resulted in 57% of the cross-sector portfolio (gas and electricity networks) being led by us. We plan to continue this approach into GD2.

Using innovation from Tokyo, we plan to use the laser methane mini gas detection device 300+ times in 2019, driving cost savings through simple and efficient surveys.

Service innovation: Ramp Up

When we learned that some of our vulnerable customers can find it hard to navigate around our street works we looked to innovation to find a solution. The problem we needed to solve was that the traditional kerb ramps that are used around street works can create challenges for customers using mobility scooters and wheelchairs.

We launched an NIA project and a total of five different partners are now working with us to design and test a better kerb transition ramp, helping people move from the pavement to the road and back more smoothly and safely.

A children's charity, Whizz Kids, will be testing the finished footway prototypes and making recommendations on which they found easiest to navigate.

The project is expected to finish in January 2020 and we will share the results.

Environmental innovation: Gasholder sludge

Dealing with waste from demolished gasholders has long been a problem. This NIA project developed a process chain that upcycles hazardous contaminated sludge into a re-usable and valuable resource.

The use of the processed sludge reduces the amount of imported aggregate needed to backfill excavated gasholder tanks and removes the need for traditional off-site incineration.

The process is cheaper (by around £120,000) and results in lower carbon emissions associated with quarrying activities and fewer lorry movements.

We plan to use this innovative method in the demolition of our five remaining gasholders in GD2.

Being responsible and minimising our impact on the environment.

Chapter 12. Dealing with uncertainty

1. Introduction

This chapter sets out the uncertainty mechanisms that form part of our GD2 business plan.

The aim of uncertainty mechanisms is to ensure appropriate funding that reflects the commitments we must deliver and the requirements of our stakeholders.

We have reviewed:

- the current GD1 uncertainty mechanisms (for all sectors);
- stakeholder feedback;
- Ofgem's proposals as set out within the Sector Specific Decision document for GD2;
- information received after the Decision document, including Ofgem's net zero letter (dated 8 August);
- feedback received from the CEG and from the RIIO-2 Challenge Group.

External decision makers, regulatory discussions and decisions after we have submitted our business plan which alter the assumptions contained within our plan may change the risk profile for stakeholders and ourselves. These changes may require us to modify our proposals in order to achieve an acceptable level of risk and financeability.

It is clear from the Sector Specific Decision documents (and net zero letter) that further collaborative engagement between Ofgem and all stakeholders is required to work through additional detail and ensure a fully developed package of measures.

Meeting net zero

Section D of this business plan outlines our vision and commitments to be net zero ready by 2035. To deliver this vision our role will need to evolve, and this will require flexible funding mechanisms to be available – both to protect customer bills and to protect network financeability.

We have therefore included within our proposals an outline of a new net zero review mechanism. This new mechanism would allow for a timely review and delivery of funding requirements as a result of any future decision by a relevant group – such as a joint BEIS, Ofgem and industry group.

Our business plan uncertainty mechanism proposals

Uncertainty in cost forecasts can arise for several reasons, including:

- the amount of an activity we need to conduct, as well as the cost of the activity;
- uncertainty in relation to outputs that we are required to deliver which can arise, for example, from changes in legislation or government policy.

The decision to move to a five-year price control period significantly shortens the period over which we need to make forecasts. However, it is possible that even within a five-year period there is significant variation from our base case planning assumptions.

If the uncertainty is outside of our control and has the potential to significantly affect our expenditure and customer bills, then the use of an uncertainty mechanism is appropriate.

Options considered

- Simplification. There is a danger that the current list of mechanisms as documented within the May 2019 Ofgem Sector Specific Methodology Decision document grows as a result of legitimately justified areas identified by different networks. Therefore, there may be the opportunity to simplify the 'Re-opener' trigger mechanism to simply allow networks to trigger a re-opener should the 'necessary test' and 'materiality' threshold be met. This has been discussed with the Customer Engagement Group and there is a recognition that simplification could be an option. We would be happy to engage with Ofgem and other networks to discuss this option ahead of draft determinations during 2020.
- No uncertainty mechanisms. This has been ruled out as the cost of capital and totex allowances requested are based on the assumption that the current principles for funding non-controllable costs are maintained within the framework.
- Application of existing uncertainty mechanism principles. This is the basis of our current business plan. The remainder of this chapter outlines our proposals within this option.

For GD2 we are proposing a range of uncertainty mechanisms to deal with these forecasting risks:

- Where the needs case or the scope of projects is unclear, we propose the use of re-openers.
- Where there is uncertainty as to evolution of quantities or demand, we propose the use of volume drivers.
- Where there is uncertainty over the evolution of prices (such as the price of labour and construction materials), we propose the use of indexation, where possible.
- For expenditure that is entirely outside of our control, we will continue to use pass-through costs (such as for business rates).
- For investments to support net zero we propose a 'net zero review mechanism'.

- We have used a mixture of historic costs, expert knowledge from relevant and experienced managers and to a degree some element of forecasting to justify and generate the potential cost impacts.

A summary table of our proposed uncertainty mechanisms is provided to allow easy comparison with Ofgem's proposals. The table includes the current GD1 mechanism and Ofgem's proposals, as set out within the May 2019 Sector Specific Decision document. It should be noted that we agree with most of the uncertainty mechanisms as proposed in the May 2019 document. The Ofgem net zero letter (published on 8 August 2019) outlined the need for "flexible uncertainty mechanisms" to address future unknown investments and we include outline proposals within this chapter to support this need.

The remainder of this document provides an explanation for areas where we propose an outcome that is different from Ofgem's current proposed treatment and any new mechanisms.

Chapter 12. Dealing with uncertainty (continued)

2. Summary table – uncertainties

Uncertainties summary table

Section	Name of uncertainty mechanism	GD1	Ofgem GD2 proposal	Our proposal
	Ofgem licence fee	Pass-through	Pass-through	Pass-through
	Business rates	Pass-through	Pass-through	Pass-through
	Miscellaneous pass-through	Pass-through	Pass-through	Pass-through
	Third party damage and water ingress	Pass-through	Pass-through	Pass-through
	Cost related to gas theft	Pass-through	Pass-through	Pass-through
	Review of agency (Xoserve) costs (also in GT2)	Re-opener	Pass-through	Pass-through
	Review of the non-gas Fuel Poor Network Extension Scheme (FPNES)	Ex-ante allowance, incentive & re-opener for scheme review	Re-opener	Re-opener
a	Specified street works	Re-opener	GDNs to propose mechanism otherwise baseline allowance	Baseline allowance and/or re-opener
b	Smart meter roll-out costs	Baseline allowance and/or re-opener	GDNs to propose mechanism otherwise baseline allowance	Baseline allowance and/or re-opener
c	Net zero review mechanism	N/A	GDNS to propose mechanism	Net zero funding review mechanism
	Repex – Tier 2A iron mains	Volume driver	Volume driver	Volume driver
	Repex – HSE policy changes (including stub ends)	N/A	Re-opener	Re-opener including stub ends
	Real Price Effects	Ex-ante allowance	Indexation	Indexation
	Pensions (established deficit, pension scheme administration and Pension Protection Fund levy)	Re-opener	Re-opener	Re-opener
	Pension deficit charge adjustment	Pass-through	Pass-through	Pass-through
	Enhanced physical site security	Re-opener	Baseline allowance and/or re-opener	Baseline allowance and/or re-opener
d	Changes to charging boundary	Re-opener	N/A	Re-opener
	Whole systems	N/A	Re-opener	Re-opener
	Heat policy	N/A	Re-opener	Re-opener
e	Cyber resilience	N/A	'Use it or lose it' allowance and/or re-opener	Baseline allowance and/or re-opener
f	Large load connection costs	Re-opener	N/A	Re-opener
g	Loss of development land claims	N/A for GD; Re-opener for GT	N/A	Baseline allowance and/or re-opener
h	Changes to DCC funding arrangements	N/A	N/A	Re-opener
i	Digitalisation strategy	N/A	GDNs to propose mechanism	Re-opener subject to further stakeholder feedback
j	Workforce resilience	N/A	N/A	Re-opener to reflect changes in approach to managing working hours from WTD to fatigue management
k	Materiality thresholds	1% of base allowed after sharing factor applied	1% of base allowed after sharing factor applied	Ensure risk/reward balance is maintained as per GD1
l	Aggregate cap on network re-openers	Aggregate cap	N/A	Aggregate cap as per GD1
	Inflation indexation of RAV and allowed return	RPI	CPIH	Click **Chapter 22: Financeability** for further information Click **Appendix 22A** Click **Appendix 22B**
	Cost of debt indexation	Indexation iBoxx 10 years	Indexation iBoxx 11 to 15 years	
	Cost of equity indexation	N/A	Indexation	
	Tax	Base allowance with trigger and claw back mechanism	Three options being considered	

Chapter 12. Dealing with uncertainty (continued)

3. Evidence to support our uncertainty mechanisms that differ from Ofgem's Sector Specific Decision proposal

a) Specified street works

The risks we face in GD1 remain for GD2. In particular: the legislative implementation of existing NRSWA 1991 sub-sections (ie long-term damage); the Traffic Management Act 2004 (ie lane rental charging); changes to existing legislation (ie extension of reinstatement guarantee; increase in inspection regime, 24-hr working); and the Welsh Government's plans are expected to evolve over the 2021-26 period. It is therefore appropriate to retain a GD2 uncertainty mechanism.

We have included £0.9m per year within baseline totex based on compliance with existing legislation and commitments, although the requirement for a re-opener remains.

The probability of legislative development is high given the current uptake of permitry and lane rentals. The range of possible additional costs is £9m to £18m per year over the GD2 period, as broken down below:

- Legislative road permitry: £4m to £6m per year.
- Lane rental: £3.5m to £12.5m per year.
- Reinstatement guarantee: £0.5m to £1.5m per year.

b) Smart meter rollout impacts

The supplier led rollout will now continue until 2024 and, despite incurring costs of £1.5m during GD1, we are unlikely to claim a re-opener in that control period. The costs incurred to date on smart metering consist of attending emergency calls relating to smart meter faults and metallic service replacement that has been identified through smart meter installations. The risk is carried over from GD1 and we therefore propose to continue with a re-opener mechanism. We would be happy to discuss the use of a possible volume driver as discussed by Ofgem within the RIIO-2 Sector Specific Decision document.

The suppliers have regulatory obligations to deliver their smart meter rollout plans and given the delays to date, the probability of rollover to 2021 is now certain. The materiality of costs could be within the range of £0.3m to £1m per year.

c) Net zero review mechanism

As outlined previously, we believe that there should be a flexible funding mechanism that will enable us to meet our net zero ambition while protecting customer bills and network financeability.

The table below provides a forecast of costs that may be required to deliver our commitments during and beyond GD2.

To protect consumers and, given the uncertainty around future requirements, we are not proposing a base allowance.

Where spend meets innovation criteria, we propose funding through innovation mechanisms.

► Net zero forecast costs

	Work required	Cost £m RIIO-2	Cost per year
Flexible generation			
PRI upgrades	23	1.7	0.3
Pipelines for capacity and/or storage	85km	82.6	16.5
Below 7 bar reinforcement (MP and IP)	75km	29.7	6.0
Total		**114.0**	**22.8**
Green gas			
Compressors	12	16.6	3.3
Smart systems	12	1.6	0.3
Total		**18.2**	**3.6**
Gas vehicles			
Reinforcement	16km	6.3	1.3
Total	**16km**	**6.3**	**1.3**
System operability			
New IT systems and functionality, including: forecasting system upgrades and data controls		1.6	0.3
Increased manpower	Support net zero activities	0.8	0.2
Total		**2.4**	**0.5**
GD3 repex preparation			
Recruitment and training		10	2
Total estimate spend		**150.9**	**30.18**

For any other expenditure, we are concerned that the other existing uncertainty mechanisms would not protect customers or networks. For example:

- A use or lose it allowance could penalise customers for a period of time if net zero linked investments are not required for gas distribution networks.
- A re-opener is not appropriate as networks are unlikely to invest ahead of any decision and carry the risk of non-funding if future decisions are contrary to the spend incurred.

It is for this reason that we are proposing the new net zero review mechanism, which should exist for all regulated networks. This could be triggered at a time linked to updated direction and decisions from a joint group consisting of BEIS, Ofgem, industry and any other party deemed appropriate. We would support a process that encompasses the following elements:

- The mechanism is applicable to all RIIO-2 price controls.
- There is a review of options using robust evaluation.
- There is a period of consultation to allow for stakeholder input.
- Once decisions are confirmed with stakeholder support, directions are received from Ofgem to update regulatory obligations and totex allowances.
- The allowances would then form part of network revenues.

Chapter 12. Dealing with uncertainty (continued)

The RIIO-1 settlements included a mid-point review mechanism and we would see this working in a similar fashion.

At this point in time, we have not consulted with stakeholders but would be happy to engage further on this over the next 12 months and ahead of GD2 draft determinations.

d) Changes to charging boundary

Although we now have 19 biomethane connections to our network, the throughput is still relatively small (less than 1%).

We have a large number of requests for biomethane connections and the objective is to replace more and more natural gas with biogases (including biomethane and hydrogen) to efficiently support the delivery of the UK and Wales climate targets.

More than 37 gas fired electricity generating facilities of different scales are also connected to our network. As with biomethane connection requests, we have a number of potential additional electricity generation plants that could connect to our network.

As we understand it, and looking at the implications from the collaborative H21 innovation project, Hynet, Hydeploy and other work from groups such as the national Hydrogen transformation group, there is a possibility that we may well need to look at:

- the level of costs that are funded directly by the connectee as opposed to funding from customers through allowed revenues; and
- the charging boundary between gas exiting the network and gas coming onto the network during GD2.

As the use of the gas distribution network evolves, the likelihood of a charging boundary review increases. We therefore propose to retain this uncertainty mechanism. In terms of materiality, the costs could exceed £10m if c.10 connections at £1m cost each are incurred and costs are 'socialised' by all customers (as opposed to direct developer funding).

e) Cyber resilience

Following the Ofgem NIS specific guidance consultation on the protection of operational sites (which we have responded to), and the uncertain timelines for when Ofgem will issue any subsequent information, we have not included any costs in base totex.

In the absence of clear guidance from Ofgem we do not have a certain plan on the level of risk required. Our initial view is in the range of £4m to £8m, with a probability of incurring as high.

We have included this as a specific re-opener. Consideration of the frequency of the re-opener window specific to the cyber resilience issue is being considered by Ofgem, given the requirements and spend levels.

f) Large load connection costs

Although this mechanism has not been used in GD1 the risk of such costs remain. Therefore, we propose to retain this uncertainty mechanism. Severn power station was connected to our distribution network prior to GD1 and triggered efficient but material reinforcement costs. As the UK Government has ruled out coal generation from 2025, there is the possibility that this large generation gap will be fulfilled by additional large gas-fired electricity generation plants. It is therefore a requirement to retain this re-opener.

g) Loss of development land claims

Development loss claims and associated liabilities can arise from claims by land owners due to the presence of a gas pipeline affecting the productivity or limiting potential development or alternative uses of their land (including farming and quarrying). Such claims normally arise because of the terms of a Deed of Grant of Easement (referred to here as a Deed), which specifies the rights and restrictions associated with pipeline assets.

For the avoidance of doubt the following claims under the terms of a Deed of Easement can include:

- loss of, or restrictions affecting, land development (including in relation to housing and quarrying);
- loss of crop and drainage;
- sterilised minerals;
- landfill and tipping.

Within these Deeds the grantee, WWU (itself or as successor to predecessor companies for Deeds pre-2005) limits the consideration payable immediately for the grant of rights in exchange for an agreement that if permission is granted for development in the future, WWU will then either pay compensation for the impact on the development, or any sterilisation of part of it, or be subject to an obligation to 'lift and shift' a pipeline in similar circumstances.

In either circumstance, we can normally either limit compensation by choosing to divert a pipeline or, to avoid diverting under a 'lift and shift', by paying compensation. We would normally choose the cheapest, or most expedient, option if available under a Deed or through agreement with a landowner.

Given the high level of uncertainty around the volume and financial cost of development loss claims and the exercise by landowners of lift and shift clauses in some Deeds it is difficult to set baseline funding to cover this area. An uncertainty mechanism is therefore required.

The probability of claims is high and the range of possible additional costs is £5m to £40m over the GD2 period.

The following points support the case for a re- opener with regards to this issue:

a. We are exposed to the uncertainty of the risks set out under this section in a similar way as the National Transmission System. It has this type of existing uncertainty mechanism in RIIO-T1 (licence condition SC 5E).
b. Under the terms of the Deed, we are also usually required to pay compensation to a grantor for:
   - the loss of crop yield where liability has been proven and/or reported and there are proven drainage defects and subsidence claims;
   - the value of minerals that cannot be extracted and the possible loss of opportunity to landfill which is lost where mineral extraction is prevented.

Chapter 12. Dealing with uncertainty (continued)

These claims are 'no fault' claims and arise under Deeds where we or our predecessors have prudently sought to minimise the consideration payable upfront for land that has development hope value, as it not clear whether that hope value will ever be realised.

A re-opener mechanism is required for settling valid claims for compensation (including the costs associated with a diversion where that is more cost-effective than paying compensation and the Deed provides us with such an option) or funding a pipeline asset diversion at short notice where there is a 'lift and shift' clause exercisable by the grantor/landowner.

h) Data Communication Company (DCC) user cost (funding arrangements)

GDNs are not currently required to be individual users of the DCC nor fund the DCC. This is a function of effectively utilising Xoserve and saving customers' money. Therefore, no base allowance is currently required.

There has been some industry discussion about GDNs potentially becoming individual members and funding the DCC. If this happens then the efficiently incurred DCC costs will need to be funded. The potential cost range is £5m to £15m over the GD2 period.

The probability is low and is dependent on decisions by BEIS and Ofgem.

We recommend a re-opener mechanism as the simplest mechanism to address this funding gap, should it arise.

i) Digitalisation strategy

All networks and Ofgem are currently assessing the potential impact on commitments and totex cost impacts of the emerging opportunities for customers and stakeholders from access to data held within networks.

The Energy Data Task Force (EDTF) has recently published a paper on the possible future direction. While we support the principle of 'open data' there is currently no understanding of the impact this may have on stakeholder commitments and totex cost requirements.

We therefore propose a re-opener mechanism that would be triggered once there is more clarity on the direction of travel.

We would suggest a high degree of future collaboration between all networks to ensure a consistent and efficient range of outcomes from networks. At this point, it is not possible to quantify the potential cost range but the probability is high given that there is broad support for the EDTF work.

We recommend a re-opener mechanism as the simplest mechanism to address this funding gap, should it arise.

j) Workforce resilience

Recent engagement with the HSE has highlighted the potential for a material change to the maximum hours that individuals can work in any one day. If this change is implemented it could result in a material increase in our resources to deliver the business plan commitments and would need funding. The impact could be between £5m and £10m per year.

k) Materiality thresholds

As a starting position for setting the materiality threshold for each re-opener under GD2, Ofgem thinks that the GD1 approach and level is broadly appropriate.

However, Ofgem states that some additional thinking may be required in this area, and we agree. Our business plan assumption is that we are exposed to the existing GD1 materiality threshold on a cash basis for individual and aggregate re-openers. We will be less able to absorb non-funded costs during GD2. Our proposed cost of equity excludes any additional risk from this exposure.

There is further work for Ofgem and the networks to undertake through licence drafting for GD2 related to this area.

A worked example below highlights the potential additional cash risks to networks if this is not addressed:

Existing GD1 sharing factor for WWU = 63.17%.

Existing GD1 materiality threshold for WWU = £341.3m.

Existing trigger % of materiality threshold = 1%.

Existing WWU materiality threshold after sharing for WWU = £3.41m. (1% * £341.3m).

GD1 – existing funding

- If we incurred a non-funded and eligible cost of £6m; with the existing sharing mechanism (63.17%); this would 'trigger' a re-opener as £6m * 0.6317 = £3.8m, which is greater than the trigger threshold of £3.41m.
- Subject to efficiency tests, the £6m would be funded.

GD2

If the totex sharing factor was changed to 35% for GD2 and other existing algebra retained then the trigger calculation for WWU would result in a failure of the GD2 materiality threshold as £6m * 0.35 = £2.1m, which is less than £3.41m. In this instance, networks would incur unfunded uncontrollable costs of £2.1m. This is not acceptable.

l) Aggregate cap on network re-openers

We accept that re-openers must have a materiality threshold. However, there are a number of potential cost areas that may require significant spend but in isolation fall short of a re-opener claim. It is inappropriate for networks to fund a number of re-opener costs that individually fall beneath the materiality threshold but in aggregate exceed it. This principle is contained within the GD1 licence drafting.

To retain an equivalent risk profile, we recommend retention of the existing GD1 aggregate re-opener cap subject to the updated licence drafting outlined above.

D

Delivering an environmentally sustainable network

This section of our business plan includes our Environmental Action Plan. The Plan encompasses our targets in relation to heat decarbonisation (in line with Ofgem's requirements).

This first chapter of the section explains our net zero ready vision. The vision enables decarbonisation of heat, as part of a wider, whole system pathway to mitigate the threat of climate change.

In this section:

13. Our net zero ready vision for 2035 110

Our ambitious whole system plan to decarbonise heat, power and transport in our regions, delivering a net zero ready network by 2035.

14. Environmental Action Plan 126

Our activities and commitments to minimise the environmental impacts our activities have on our communities and on the natural environment.

Chapter 13. Our net zero ready vision for 2035 CVP

1. Highlights of our plan

- Our ambitious whole system plan will decarbonise heat, power and transport in our regions, delivering a net zero ready network by 2035.
- Based on a broadly defined whole system approach, our plan will facilitate low cost, reliable and sustainable energy for generations today and in the future.
- We are responding to the clear steer from consumers, organisations such as local authorities, and public opinion in general that society must act now to mitigate the threat of climate change.
- This steer, combined with our own ambitions, provides the basis for our net zero ready vision and for the timeline to achieve this by 2035 – a pathway that while ambitious, is both credible and achievable.
- Our plan is founded on extensive research and live trials, and reflects the view from wider research and opinion formers that a variety of solutions, applied on a regional basis, will be required.
- Our approach will support the development of Local Area Energy Plans (LAEPs). These plans will provide substantial value to consumers by ensuring that energy system solutions offer the lowest cost pathway and least disruption. Pathfinder and Pathfinder Plus, our ground-breaking energy system simulator, will enable this best value to be extracted.
- The proposals in this chapter support decarbonisation of heat and as such form part of our Environmental Action Plan (Click **Chapter 14** for further information).

We will use our ground-breaking and unique Pathfinder model to fully support Local Area Energy planning.

2. Introduction

This is a critical time for the UK energy sector, with legally binding obligations to eradicate the UK's net contribution to climate change by 2050. At the same time the energy system (gas, electricity, transmission and distribution) is fast becoming one of complex, dynamic interactions, driven by changes in the supply and use of energy. We therefore must consider the whole system.

The UK Government's June 2019 decision[1] provided greater certainty about the timeframes for our sector to deliver a zero carbon energy system. Our plan to be net zero ready by 2035 represents our contribution to this goal, meaning that our network will be able to support the required quantities of green gas, eliminating the need for fossil methane. We will be able to support flexible generation and transport, which in turn supports decarbonisation of the electricity and transport sectors. We decided to choose the date of 2035 to reflect the ambition of our stakeholders and in response to their climate emergency declarations, including by the Welsh Government and local authorities. It is also the earliest date that allows a sensible balance between the speed and cost of delivery.

Click **Appendix 13A** for information about our strategic approach to the future of energy challenge.

1 The Government amended the Climate Change Act in June 2019. This was in response to the Committee on **Climate Change's report 'Net Zero – The UK's contribution to stopping global warming', 2 May 2019**.

As part of our extensive programme of research we have listened carefully to those with alternative views.

Click **Appendix 13B** for further information on the wider decarbonisation debate with stakeholders.

This plan defines our net zero ready vision for 2035 – our objective being to anticipate how customers' use of the network might change as they move to using lower carbon technologies and as they move towards lower carbon gases and avoid the use of fossil fuels. It also describes the investments necessary to allow our network to support these new requirements and a separate net zero CVP has been created.

Click **Appendix 13C** which sets out the net zero Consumer Value Proposition.

CVP net zero

Our net zero CVP delivers £4.3bn of value; our vision delivers over £30 of net value for every £1 invested.

3. Aspects that are certain

The sector is going through significant change, and clear trends are emerging that have informed our investment proposals for GD2 and beyond.

- Energy networks are becoming more closely integrated, interacting in more complex and dynamic ways. Our demand data clearly shows the increase in the use of flexible gas generation at times when renewable generation decreases due to weather conditions. It also reflects new generation requirements as older coal-fired stations are decommissioned.
- Customers with different requirements and behaviours are having a significant impact on our network. For example, we are having to increase the frequency with which we reconfigure our medium and intermediate pressure systems to enable green gas producers to inject during hot weather (when demand is low). We also expect to implement smarter systems to manage changes in network flows to support gas and electric vehicle charging.
- Peak demand is set to increase by 11% over the next 10 years due to the new requirements detailed above. Investment will be required so that we can continue to provide a reliable and safe supply of gas. This will be necessary in spite of an expected reduction in annual gas demand because customers will be using gas in different ways.
- Flexible generation tends to be gas powered. These generators are making use of the cheap form of storage provided by our network, offering flexibility and a quick response at a lower cost than many other forms of electricity storage. By making use of our network, flexible gas generators can compete in the services they provide for electricity balancing, benefitting electricity customers.
- The Future Homes Standard that is being consulted on would prevent gas supplies to new housing. In isolation this would limit further peak demand growth; however, alternative technologies may still have an impact on gas networks via hybrid heat networks and CHP.

Click **Appendix 17B** for further information.

Chapter 13. Our net zero ready vision for 2035 (continued)

– To minimise whole system costs there is now a growing consensus that, instead, we must consider all technologies, and on a regional basis. This view was recently confirmed by, among others, the Committee on Climate Change[2]. It was also supported by our own Green City Vision project[3], in collaboration with SSEN and UKPN.

4. Our net zero ready vision

How we developed our vision

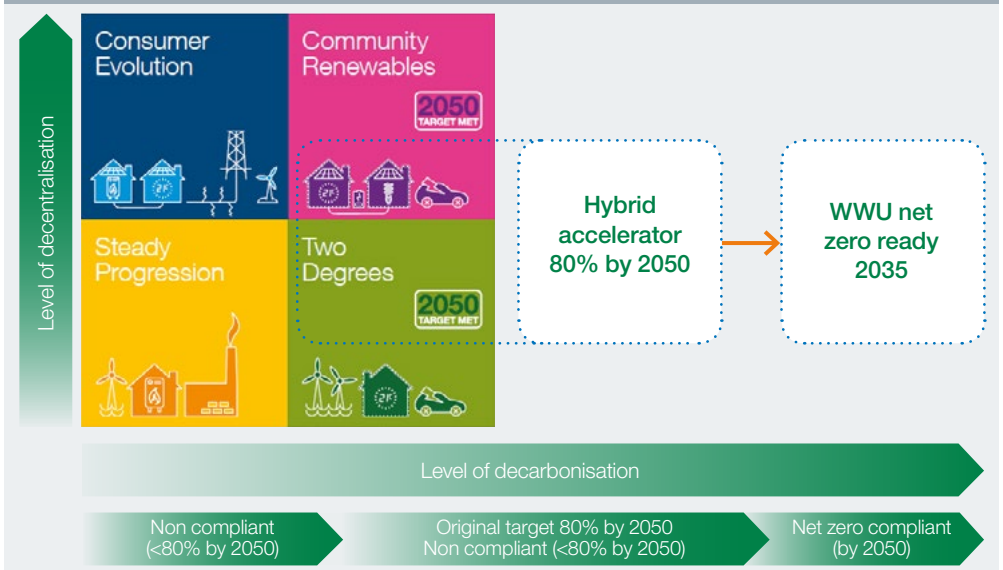
It is with the above certainties and trends in mind that we have developed our ambitious, evidence-based net zero ready vision for decarbonisation in our regions. Founded on a broadly defined whole systems approach, our vision will facilitate the low cost, reliable and sustainable energy that our customers want for their heat, power, light and transport – both today and tomorrow.

A key input to our vision are the results from our Regional Future Energy Scenario (FES) innovation project. For this project we commissioned Regen to develop forecasts of our customers' requirements through to 2035 for a range of scenarios including four that were aligned to the National Grid FES framework and the 'hybrid accelerator', which increased the use of hybrids and biomethane. Regen's forecasts[4] were based on significant stakeholder engagement and input from four workshops carried out across our regions, which included a session looking at specific challenges around the decarbonisation of industry.

We have ensured that these forecasts can be used in our whole system modelling using our innovative and unique whole system energy model, Pathfinder[5].

2 'UK Housing; Fit for the Future?', 21 February 2019.
3 Click **Appendix 13D** for information on Green City Vision.
4 Click **Appendix 13D** for information on Regional FES.
5 Click **Appendix 13D** for information on Pathfinder.

Figure 1: Progression of our vision



Pathfinder models the whole system energy flows (on an hourly basis) to meet heat, light, power and transport demands for a given scenario using a mix of energy supplies that is also specific to the energy scenario.

Click **Appendix 13D** for information about our future of energy research.

Click **Appendix 13E** for information on how Pathfinder will support the development of LAEPs.

Click **Appendix 13F** for information on our whole system approach.

Learning from the recent all-GDN Pathways project which was led by the Energy Networks Association (ENA) showed that the north of the UK is most likely to make significant use of hydrogen while the south is more likely to move to biomethane. This is due to carbon capture, usage and storage opportunities in the north.

Following the recent net zero announcement we have used the outputs from regional FES, learning from Pathways, and stakeholder support as the basis of our new net zero scenario; this scenario assumes an even greater penetration of green gas in our local distribution zones and also accounts for hydrogen post 2035 to meet the 2050 net zero requirement.

The position of the scenarios in Figure 1 reflects their relative level of decentralisation and decarbonisation by 2050. The first block of scenarios in the figure shows the National Grid FESs, which are well established within the sector.

The two scenarios to the right (hybrid accelerator and net zero ready) are scenarios developed by and for WWU, reflecting the specific regional factors for our networks. In the case of the last scenario – WWU net zero ready – we have increased the ambition to meet the new 100% net zero requirement.

Our commitment

Deliver a net zero ready network by 2035.

Chapter 13. Our net zero ready vision for 2035 (continued)

Our vision

Our vision is to meet the levels of decarbonisation supported by the WWU net zero ready scenario above. Decarbonisation will be achieved in the following ways.

Reduced demand:

- Customers' annual demand for gas for heating will be reduced as they adopt more efficient and flexible systems and continue to make improvements to insulation in their homes and businesses. These savings have most impact away from peak when insulation is most effective and when hybrid systems will operate on electricity. The SSEN/WWU/UKPN Green City Vision project found that up to 20% CO_2 savings were delivered by insulation improvements.

Click **Appendix 13G** for further information on smart hybrid heating systems.

Hydrogen for industry and cities:

- The UK's largest cities and big industry will be converted to run on hydrogen. In our region the cities are expected to be Swansea, Cardiff, Newport and Bristol. Hybrid heating systems (as trialled in our Freedom project)[6] will help make the best use of hydrogen and renewable electricity.

Biomethane and blended hydrogen for other cities, towns, suburbs, and smaller industry:

- Remaining cities, towns and suburbs will be fuelled by green gas and have hybrid heating.
- The FreeNonDom project (a project investigating the use of hybrid heating systems for non-domestic customers) has demonstrated the use of hybrids for non-domestic loads.

Transport:

- Many heavy goods vehicles, buses and trains will be fuelled by hydrogen or green gas, significantly reducing carbon emissions.
- The vast majority of private cars will be electric vehicles, with more than 30m on the road across the UK, partly fuelled by electricity generated from green gas.
- Gas and electric vehicles are cleaner than petrol and diesel and will significantly improve air quality.

Power:

- The primary sources of electricity will be renewable.
- Wind, solar, marine and a small fleet of nuclear power stations supported by back up green gas generation plants will keep the lights on.
- A small amount of electricity storage across the UK will help balance the grid (including from vehicle to grid), while smart hybrid systems installed in homes and businesses will enable flexibility through the use of smart controls that can move demand between gas and electricity to optimise whole system operation.

The vision we have set out here is the most plausible and suitable for our regions; it also remains flexible and allows for alternative future pathways. In this way, customers' interests will be protected.

The research we have undertaken as part of this work – including our analysis of the rate at which new heating technologies are being adopted in our region – supports the investment that is already planned in GD2 as part of our base allowance. As such it represents no regrets investment.

The vision has been determined using local-level information from our Regional FES and Pathways projects to understand where transport and green gas investment are most likely to be needed. In order to determine the potential specific reinforcement required for flexible gas generation connections we have also used information from our connections register and from the capacity market register for future loads.

6 Freedom was a live trial where we installed air source heat pumps alongside gas boilers in 75 homes alongside smart functionality to optimise both appliances. Click **Appendix 13G** for further information.

Chapter 13. Our net zero ready vision for 2035 (continued)

5. Enabling whole systems

As this chapter has already outlined, in recent years the need to consider interactions across different sectors – transmission and distribution, power and gas – has become increasingly important. This applies locally and nationally, particularly given that many local authorities are declaring climate emergencies and are looking for decentralised solutions. For example:

- the increase in EVs is likely to impact on demand from flexible gas generators at peak times;
- high costs associated with electricity connection and opportunities to avoid high time of use tariffs or provide demand-side response services are leading to increased gas flows to support CHP for on-site generation;
- the uptake of air source heat pump technology has the potential to reduce annual gas throughput, although where these are implemented as part of a gas hybrid solution we anticipate that peak gas demands will be less affected.

We are the only network to have developed a high-resolution, whole system model in recognition of these increased interactions, Pathfinder Plus. The model supports the planning processes across the gas and electricity networks and can be used by third parties to support development of local decarbonisation plans.

We have shared Pathfinder with other networks, with SGN having adopted it to simulate Brighton and Edinburgh. Other networks are considering its use.

Plans and processes for joint planning with other network companies

Working with others and sharing best practice allows us to constantly improve for the best.

We have a long history of working closely with other gas network companies. In GD2 we will continue to drive joint planning and collaboration and will formalise our work in this area through our new whole systems charter (described below). This is supported by formal requirements such as those in our licences and Uniform Network Codes; and workgroups such as the Gas Futures Group, which is coordinated by the ENA.

CVP For every £1 invested in sharing our whole systems data and Pathfinder model, there is £40 of value to consumers.

Our culture of sharing learning and best practice is demonstrated by our collaboration around both innovation projects and improvement activities.

Specific areas of focus will include:

- continuing to work closely with the National Grid ESO, providing input from our research and data from our control systems to support the production of their FESs;
- continuing to support the industry review of NTS capacity access arrangements.

During GD2 we will build on our relationships with DNOs, having already completed energy innovation projects with SSEN, WPD and UKPN.

We will also continue to collaborate through industry groups such as the single scenario workgroup and the Open Networks project.

A recent collaboration is Zero2050, an initiative led by National Grid to speed up progress of the decarbonisation of South Wales. The partnership, which encompasses business, community, academia and others, is using Pathfinder Plus to develop a whole system solution.

Click **Appendix 1D** for letters from SPEN and WPD about our successful collaboration in GD1.

Identification and adoption of potential whole system solutions

We recognise opportunities to benefit from standardised processes across networks so that processes and equipment can be designed for use across the whole of the UK. There are opportunities too for networks to benefit from streamlined processes such as increased data sharing and consideration of whole system solutions to avoid investment. This would benefit customers by reducing costs.

As far back as 2010, we led an industry review of the Offtake Arrangement Documents to relax some of the notification periods required for rate changes, so we could increase the flexibility we offer our power generation customers to allow them to participate more fully in electricity markets. During GD2 we will:

- continue to actively support the Open Networks project through the advisory group. We are currently leading Workstream 4, Product 2: Whole networks real-time operation, and supporting Product 4: Investment;
- continue to explore whole system solutions for managing the demands of peak heat while maximising use of available renewable energy and green gas.

In collaboration with other partners and Western Power Distribution, Project Freedom investigated how smart control systems could control hybrid heating systems. The objective was to minimise the investment that would be required on DNO networks to support peak heating requirements by using the flexibility available in the gas networks

- This would be done by heating homes via gas boilers when this is a better solution for whole system operation. This work is now being expanded for non-domestic customers through our FreeNonDom project.

Long-term whole system thinking

Investigating regional decarbonisation plans to enable whole systems thinking can assist in the development of future networks and reduce carbon emissions.

We have undertaken extensive research and stakeholder engagement to help us and others understand the impact of future scenarios on stakeholders and networks.

In addition to using our Pathfinder model for our own analysis we have shared it with external groups that are keen to develop regional decarbonisation plans. We engage with wide-ranging steering groups and advisory panels including Flexis, LEPs and the Welsh Government. We also commissioned and sponsored the national Carbon Connect series.

Chapter 13. Our net zero ready vision for 2035 (continued)

Whole system investment in GD2

Our Green City Vision project is a specific example of the way in which we have used Pathfinder and worked with DNOs to consider how a range of long-term future decarbonisation approaches would impact whole systems usage in a real location (in this case Swindon). This project used a bespoke analytical approach to provide a consumer driven solution that delivers desired outcomes for future consumers, namely decarbonisation of heat, power and transport at the lowest cost and least disruption.

Our Regional FES project is a ground-breaking approach to mapping every locality in our region as a basis for working with DNOs to find optimal long-term solutions for heat, power and transport. This provides net benefit for each sector's consumers – minimising bills, maintaining reliability and enabling decarbonisation.

The above are examples of local area energy planning, whereby we work with DNOs and the local community to devise optimal approaches for specific regions.

We recognise the value and support we can offer local authorities in developing their decarbonisation plans by providing data, modelling capability and whole systems understanding. We are currently working with a partner to scope out and develop guidance documentation in this area.

In GD2, we propose the development of our future of energy team under an uncertainty mechanism so that we are resourced to provide this service. In this way we will make sure that consumers receive the best value from both GD2 and ED2 in a whole systems way.

By including transport in our whole systems approach, we generate benefits for broader sections of society, such as determining the optimal transport policy for each locality, for example whether public service vehicles should be fuelled by batteries, biogas or hydrogen. The alternative options can be evaluated and benefits quantified. This whole system approach, which we have led locally, links the energy generation opportunities in a region with the low carbon demand requirements.

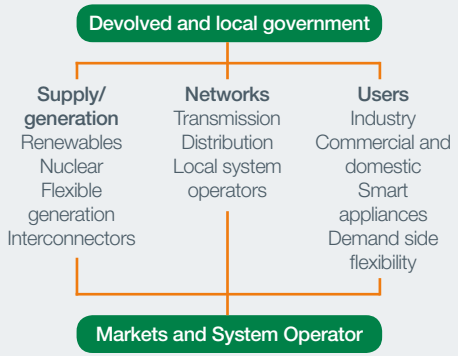
Pathfinder Plus

This tool is a derivative of Pathfinder but includes detailed whole system costing algorithms. It will be used with partners in the whole energy system, is valued as part of our CVP and provides the following benefits:

- Develops proposals that can be valued and compared with alternative scenarios, providing annual dual fuel bill predictions.
- Identifies and quantifies benefits to the broader area of society, such as the consumer and system benefits of energy efficiency.
- Enables market based solutions to be compared and utilised by defining the whole system as being wider than networks.
- Allows comparisons of proposals with business as usual.

Pathfinder Plus

PathfinderPlus will be utilised with organisations across the whole system:



The Zero2050 project will identify potential opportunities for the south Wales region, utilising Pathfinder Plus to seek agreement between wider stakeholders on optimised proposals and to understand the trade-offs between the whole systems partners. This would include, for example, the optimised use of say battery storage and flexible generation capacity.

Implementing whole system solutions in GD2

Justified by analysis to date, we have created costed proposals in the key areas where we can contribute as a whole system partner. These include enabling renewable generation, the connection of green gas and the facilitation of transport. The proposals described exceed historical 'business as usual' activity and are principally designed to enable the decarbonisation of energy.

We describe the investment in the following sections. We will continue to work with prospective whole system partners and towards the end of 2019 we will also have visibility of the recommendations proposed by the Open Networks – Whole System workstream.

We will review the investment on our network or other opportunities that will support a more coordinated and efficient whole system. In the meantime, we include the investment within a proposed uncertainty mechanism to ensure that consumers are always protected.

To further demonstrate our commitment and formalise our work in this area, we propose a whole systems charter to underpin our approach. The charter will commit us to work with stakeholders to create customer focused, least cost and joined up solutions to deliver net zero:

1. Stakeholder engagement
2. Data and information sharing and innovative solution proposals
3. Whole system Local Area Energy Plans development
4. Understand the customer value or 'business case'
5. Open the proposals to competition, including market solutions.

We propose to ask the Customer Engagement Group to review our progress against the charter on an annual basis.

Chapter 13. Our net zero ready vision for 2035 (continued)

6. Our contribution

Figure 2 shows the key elements that will be necessary to deliver our ambitious net zero ready vision. It is set out in five-year blocks, taking us from GD1 to 2036, recognising the GD2 timeframes.

These numbers are derived from internal sources such as our enquiries database and external sources such as National Grid FES, as well as reports from BEIS and from the Association for Decentralised Energy. In some cases we have increased the level of ambition where these reports were based on 80% decarbonisation targets.

Our commitment

Ensure that the investments we make today will support future energy scenarios and therefore represent a 'no regrets' energy solution.

£700

The potential savings for customers using hybrid heating systems, as demonstrated by Project Freedom.

Our net zero ready network pathway, whilst ambitious, is both credible and achievable.

Figure 2: Our net zero timeline

			Cumulative			
		2019 Baseline	2021	2026	2031	2036
A: Enabling renewable electricity generation						
Enabling renewable generation	Flexible generation connected (MWe)	628	644	2,002	3,197	4,253
B: Green gas capacity – to enable a biogas grid in non-hydrogen areas						
BioGases (inc H2 blending)	Annual BioGas capacity (TWh)	1.7	2.7	11.3	18	24
	Compressors (Nos)		1	12	23	33
	Smart control systems (Nos)		1	12	23	33
C: HGV/PSV transport						
HGV/PSV transport	Biogas filling stations (Nos)	3	12	49	61	58
	Hydrogen filling stations (Nos)	0	0	2	10	13
D: A hydrogen ready network for industry and cities						
Hydrogen (100%)	National trials		✓			
	1st National Cluster			✓		
	NW England Extension to N Wales			✓		
	South Wales Cluster				✓	
	M4 extension to Bristol					✓
E: Enabling low carbon heat networks						
Heat Networks – Gas CHP/gas hybrid	BEIS HNDU supported schemes (Nos)	0	0	9	17	24
	General roll-out – FES19 derived (Nos)	440	600	1,900	2,600	3,300
F: Low cost; low carbon distribution system						
Low Cost; Low Carbon Network	PE in Distribution System (%) – LP/MP		75	83	92	100
	Distribution pipeling leakage (GWh)	256	241	216	110	24
	AGI Venting and leakage (GWh)	73	70	60	13	3
G: System operability						
System operability	New forecasting tools			✓		
	Smart system and compressor control		✓	✓	✓	✓
	DNO/GDN process and planning alignment	✓	✓	✓	✓	✓

Chapter 13. Our net zero ready vision for 2035 (continued)

7. Investment and justification

In 2018 Ofgem and the RIIO-2 Challenge Group asked networks across transmission, distribution, gas and electricity to agree a set of common factors and assumptions in developing a single view of the future. The work that was completed in 2019 forms a baseline for Ofgem, and for us, and we have used the lowest of the range as a comparator for each of our own scenarios below.

Click **Appendix 13H** for more information on the single scenario.

Our investment planning demonstrates that a small amount of investment of £1.7m will be required in GD2 to upgrade some of our pressure reduction installations as part of our base allowance. In addition we will need to continue with our mains replacement programme (the costs of which are set out in Chapter 16). This investment has a high level of certainty, as in most cases it:

- is based on known customer enquiries or capacity market information which are consistent for all scenarios; or
- is based on evidence from the Pathways project that every street will still need a gas pipeline, albeit that it may be being used to carry low carbon gases (this applies particularly to the mains replacement project);
- has been included in our BAU totex plan because it supports any current licence obligation delivered through our current connections policy.

The uncertainty mechanisms by which we propose that additional investment is funded to support our net zero vision will take account of the lower levels of certainty we have about growth related to decarbonisation in our region.

Where proposals are above the levels described in the single scenario, and are outside our current licence obligations, and may mean us taking on additional risk we are proposing appropriate uncertainty mechanisms.

Click **Chapter 12: Dealing with uncertainty** for further detail on the elements that will be necessary to deliver our ambitious net zero ready vision. 104

Of the seven elements (as set out in Figure 2) that make up our contribution, four will require investment in GD2. The remaining elements will require investment in GD3 and beyond. It should be noted that any investment will be iterative and will only be made once customers' requirements are fully confirmed. Until we have that specific customer information it is not possible for our proposals to be fully justified and costed.

We summarise each element below and provide more detailed information in a series of appendices,13I to13N.

A: Enabling renewable electricity generation

Using our existing infrastructure for energy storage keeps costs low and enables more renewable electricity generation.

As outlined above, in recent years there has been a rapid increase in electricity generation connecting to the local power distribution networks.

As renewable generation cannot provide the resilience of controllable generation and there has been a decline in the use of coal, we have seen a dramatic shift to gas flexible generation.

In our region we have connected 31 flexible generation sites to date in GD1. These generators make use of our network's flexibility in providing significant storage to offer more competitive flexible generation services that enable electricity network balancing.

By using the existing pipeline system to store gas, the UK gas network is providing a cheap form of storage. The level of value was recognised in Imperial and Poyry's 2017 report[7] for the Committee for Climate Change, which confirmed that using increased flexible gas generation would deliver annual reductions in whole systems operating costs of £612m.

We anticipate that a large number of flexible generation sites are likely to connect in the next few years.

To make sure that we would not be investing unnecessarily we have explored the potential for constraining developers' flexibility and, in some cases, have added new terms to network exit agreements.

£612m

Using the flexibility provided by our network avoids £612m a year whole systems operating costs.

We held interruption auctions both this year and last, and to encourage participation we contacted sites directly where interruption would help us offset the pipeline investments above. No contracts were forthcoming at any price.

Click **Appendix 13I** for more detailed evidence, both on the general trends in generation sources and the impacts on our network.

Through our engagement with large industrial users we understand the reliance they place on a reliable supply, particularly for high heat processes where disruption could have significant cost impacts on equipment and production. We also know that many businesses are increasing their use of CHP, and the role gas plays in providing a reliable source of electricity even where the electricity network is constrained.

An example of the impacts of additional flexible generation on network capacity is the situation in the Swansea area, where accommodating additional demand for flexible gas generation would materially impact flows in our network and result in supply issues in Pembrokeshire. This is because a pipeline in this area has reached capacity and so would constrain flows. Reinforcement on the lower pressure tiers would also be required here. This, and other examples, are detailed in the table overleaf.

Gas flexible generation will support decarbonisation of the whole system by providing the flexibility needed to enable the continued increase in the use of renewable generation.

7 https://www.theccc.org.uk/publication/roadmap-for-flexibility-services-to-2030-poyry-and-imperial-college-london/

Chapter 13. Our net zero ready vision for 2035 (continued)

This is valued as part of our net zero CVP. It supports whole system operation by acting as a primary interface between the gas and electricity networks. Flexibility in the gas network supports the requirement in the electricity network, and facilitates increases in electricity demand for electric vehicles and other new technologies.

Investment required in GD2

Figure 3 shows our projection compared with the lowest range of the single scenario allocation for our region. It can be noted that we are already above single scenario levels.

Click **Appendix 13I** for further information on our projection.

Significant investment for new pipelines would not be funded by us under current arrangements, which would stifle growth required to support renewable generation. We believe arrangements may need to change to address the impediments so that the UK's net zero ambition can be realised. To recognise this, and because forecasts are above the single scenario, project funding is proposed to be a net zero uncertainty mechanism. This means that funds would only be released to us for the work once evidenced by customer requirements or policy change. It should be noted that the developer would still be responsible for the connections costs associated with their project.

Click **Chapter 12: Dealing with uncertainty** for further information.

104

We have identified that the following investment will be required in GD2.

Flexible generation funding mechanisms

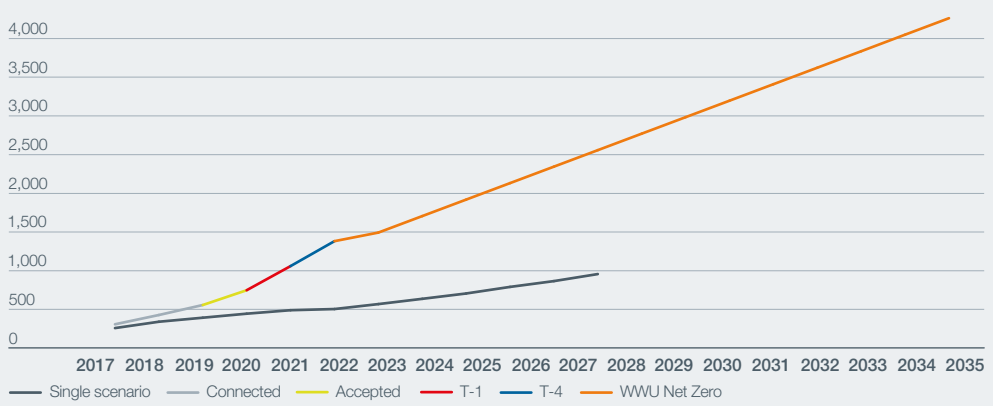
	Work required	GD2 costs £m	Proposed funding mechanism (note as ex-ante totex, or net zero review mechanism)
Pressure Reduction Installation upgrades		1.7	Baseline totex
Pipelines for capacity and/or storage	**Northern System** 7.7km x 450mm diameter from Wickwar, north towards Berkeley Road	7.7	Net zero mechanism
	Central System 2.2km x 500mm diameter from Corston Field, west towards Brislington tee (Queen Charlton)	2.2	
	13.8km x 300mm diameter from Corston Field, south east towards Trowbridge	13.8	
	East Dundry rebuilt to operate with a minimum inlet pressure of 10 bar (it is currently designed to operate down to 12 bar)	–	
	Southern System 8.9km x 500mm diameter from Choakford, east towards Tigley	8.9	
	20km of at least 200mm ST pipeline from Bancyfelin Pig Trap to Lampeter Velfrey	20.0	
	+ another 30km post t-4 but projected for GD2	30.0	
Below 7 bar reinforcement (MP and IP)	75kms	29.7	Net zero mechanism
Total		**114.0**	

Figure 3 shows the amount of electricity that could be generated by gas generators connected to our network and the status of those connections. This forecast is based on intelligence acquired from the sector, including the accepted enquiries and the T-1 and T-4 capacity auction data that has been published. This data was extrapolated to 2035. We recognise this level is a high proportion of the FES projection for this year but the proposed net zero uncertainty mechanism would protect consumers.

CVP net zero

Our net zero CVP for renewable generation delivers an NPV benefit of £40.5m; for every £1 invested this delivers a net benefit of £0.40.

Figure 3: Flexible generation output MWe[1]



1 These figures are for flexible generation that are in addition to a small number of larger connected sites which were originally connected as base load.

Chapter 13. Our net zero ready vision for 2035 (continued)

The overall investment required to support flexible generation in GD2 is £1.7m ex-ante totex and £112.3m via the net zero uncertainty mechanism. This represents a contribution for customers of 20 pence per bill per year. This would allow us to support the ongoing and increased use of renewable intermittent generation in our region and replace decommissioned coal generation.

Note: this is based on the 2018 single scenario work, current progress using the outputs of our regional FES innovation project, and our latest intelligence of sites being developed in our region via our own enquiries database and the t-4 capacity mechanism.

B: Green gas capacity

Enabling the use of greener gases will reduce carbon emissions.

We have connected 19 biomethane sites during GD1 and have a further seven accepted enquiries. In total, the 26 sites would provide heat to 175,000 homes if fed into a traditional heating system, or around a million hybrids. Our current projections to achieve net zero are for a further 25–35 sites to connect during GD2.

Click **Appendix 13J** for further information on biogases.

Our OptiNet project is looking at low-cost ways to increase entry capacity by using compression and other new technologies.

In his 2019 Spring Statement the Chancellor announced a consultation for later this year on increasing the proportion of green gas in the grid in a bid to reduce the UK's use of natural gas. Research[8] suggests that significant feedstock is available to support further growth in this area and with a high proportion of the country converting to hydrogen the potential for our region is substantial.

We are already experiencing entry capacity issues in parts of our network and have had issues with sites being backed out at periods of low demand, usually overnight in the summer. We proactively reconfigure local pressure settings so that existing natural gas sites do not take priority over biomethane sites, with some success. However, as the number of connections to our network continues to grow, we will need to look at longer term, more sizeable solutions such as compression and storage.

It will be necessary for us to adopt this technology in GD2 so that we can accept the required volumes of green gas to support decarbonisation.

8 http://www.energynetworks.org/assets/files/gas/Navigant%20Pathways%20to%20Net-Zero.pdf

Green gas will support decarbonisation by providing low carbon gas to thousands of customers in all sectors, who will be able to continue to use their existing plant and equipment as they do now. It supports whole system operation in the same way that natural gas does now.

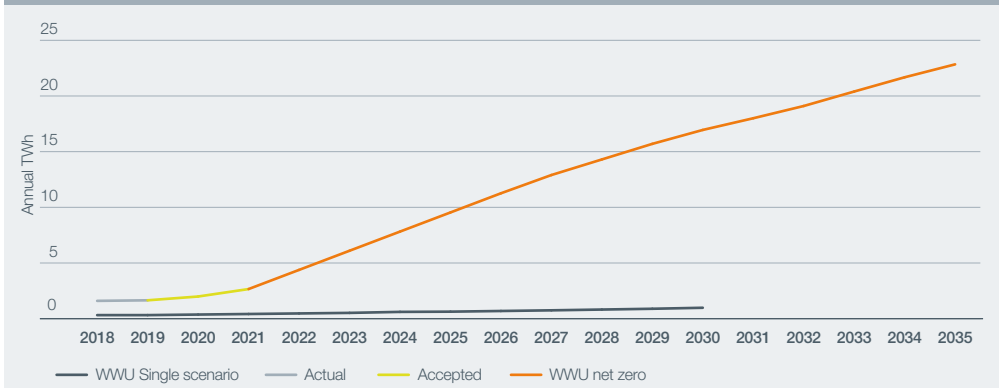
Investment required in GD2

The investment required to roll out our OptiNet technology to business as usual in other parts of the network would cost £18.2m. This represents a contribution for customers of 43 pence per bill per year, and is valued as part of our net zero CVP. There may also be a requirement for investment in interday storage to support green gas injection in GD3, unless incentive and market mechanisms encourage producers to match local and regional demands on a day to day basis. This would also improve network resilience.

Finally, we recognise opportunities to further exploit opportunities for decarbonisation by undertaking research to deal with fugitive CO_2 emissions that occur during anaerobic digestion processes prior to gas injection. We are currently scoping innovation projects in this area.

The figure below shows our projection when compared with the single scenario allocation for our region.

Figure 4: Green gas injection (excl hydrogen) Annual TWh



Chapter 13. Our net zero ready vision for 2035 (continued)

We have identified that the following investment will be required in GD2. Further information about the various funding mechanisms is provided in Chapter 12: Dealing with uncertainty.

Green gas injection funding mechanisms

	Work required	GD2 costs £m	Proposed funding mechanism
Compressors	12	16.6	Net zero mechanism
Smart systems	12	1.6	Net zero mechanism
Total		**18.2**	

The overall investment required in GD2 is £18.2m. This represents a contribution for customers of 43 pence per bill per year. This would allow us to accept increased volumes of green gas onto our network including at times of low demand.

Note: this is based on us receiving an eighth of the 193 TWh biomethane available (2050) in the Pathways report (balanced scenario), by 2035. This is supported by the fact that this project concluded that biomethane would be used in the south of the UK, with the north of the UK moving to hydrogen.

We note that this is an ambitious target and that current progress does not reflect this level of ambition because of uncertainty around the Renewable Heat Incentive.

CVP net zero

Our net zero CVP for green gas and decarbonisation of heat delivers an NPV benefit of £4.2bn; for every £1 invested this delivers a net £246 benefit.

C: Heavy goods and public service vehicles HGV/PSV

Moving to cleaner transport fuels improves air quality and reduces carbon emissions.

We have connected three fuelling stations to support CMG buses in large cities during the past few years and predict a significant increase in this area.

Fuelling stations are often most active during a relatively short number of hours in the day, at least in the case of 'return to depot' fleets when buses or HGVs come back for refuelling at the end of the day. The impact of increased demand in these cases is experienced over teatime, which is already our peak. The result is that reinforcement to support these sites is also required, often on the lower pressure tiers. The sites use compressors because the gas in the vehicle storage tanks needs to be at around 250 bar. As applications come in, we undertake bespoke analysis for each. We anticipate that in some cases a level of reinforcement will be required to support these flows. If the number of sites is large enough this could also have an impact on our diurnal storage requirement.

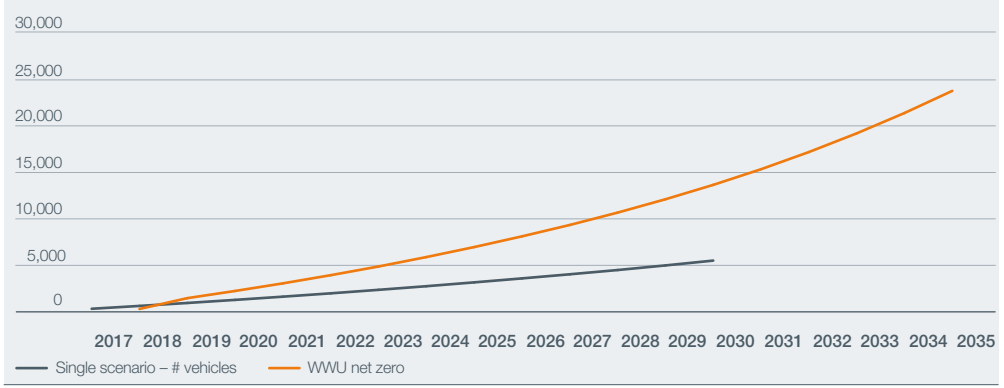
Figure 5 shows our projection of gas vehicles when compared with the single scenario allocation for our region.

Click **Appendix 13K** for further information on transport.

CVP net zero

Our net zero CVP for Transport delivers a NPV benefit of 92m; for every £1 invested this delivers a net benefit of £14.60.

Figure 5: Numbers of gas vehicles



The use of gas for transport as CMG will support decarbonisation and improvements to air quality by reducing the use of petrol and diesel for transport. Where the gas is green gas the reduction in CO_2 will be even more significant. Where gas is piped through the UK networks there will be a contribution to whole systems efficiency in reducing the amount of transport needed to move fuel around the country. This in itself will further contribute to reduced energy usage and CO_2 emissions.
We have identified that the following investment will be required in GD2

Gas vehicles funding mechanism

	Work required	GD2 costs £m	Proposed funding mechanism
Reinforcement	16km	6.3	Net zero mechanism
Total	**16km**	**6.3**	

The overall investment required in GD2 is £6.3m. This represents a contribution for customers of 1 pence per bill per year. This is valued as part of our net zero CVP. This would allow us to support the increase in use of gas vehicles, which will have a positive impact on decarbonisation and air quality.

Chapter 13. Our net zero ready vision for 2035 (continued)

D: Heat networks

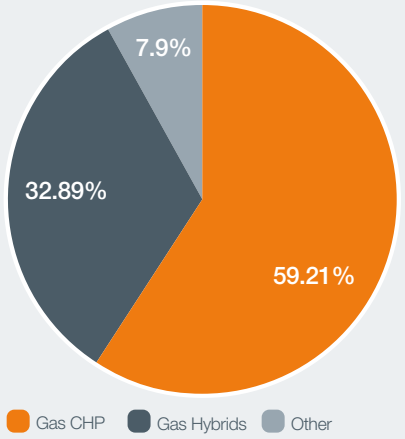
There are around 14,000 heat networks across the UK, which supply around 2% of all heat demand from UK homes, businesses and industry. Currently 91% of heat networks are powered by gas.[9] The BEIS Clean Growth Strategy suggested that heat networks could, by 2050, meet 17% of heat demand in homes and up to 24% of demand in business and public sector buildings. The UKCCC[10] proposes that 18% of homes will be connected to a low carbon hybrid heat network in its core scenario, but with the use of gas to meet peak demand.

As discussed in Appendix 13L, heat networks can increase local gas demand, and in the case of Combined Heat and Power energy centres, double it. Research from BEIS[11] indicates that 92% of future heat networks listed for delivery in the 2020s will be sourced from gas CHP or gas hybrids (see Figure 6).

However, delivery has been slow, with only nine of the BEIS promoted schemes being forecast to become operational in the area by 2026. The scale of investment requirements in these circumstances is uncertain and we are not proposing investment in GD2 base allowances, but suggest it forms part of a net zero uncertainty mechanism.

Click **Appendix 13L** for further information on heat networks and CHP.

Figure 6: Proposed heat networks – Energy source – BEIS (August 2019)



Other:
Biomass/Mine Water – 3.95%
EfW (Energy from Waste) – 3.95%

Gas Hybrids:
EfW (Energy from Waste) – 10.53%
Water source heat pump – 7.89%
Biomass – 7.89%
Ground source heat pump – 2.63%
Waste heat (w/o heat pump) – 2.63%
Biogas – 1.32%

E: A hydrogen-ready network for industry and cities

Changes to infrastructure will enable us to transport hydrogen in the network and reduce carbon emissions.

We anticipate that hydrogen uptake will be accelerated in response to the Government's net zero announcement.

18%

The UKCCC proposes that 18% of homes will be connected to a low carbon hybrid heat network by 2050.

The mains replacement programme means that our networks are largely hydrogen ready in our low pressure distribution networks. As a result, minimal investment would be required to make them properly hydrogen ready in order to support the transformation across to hydrogen.

A number of projects are underway to develop evidence and safety cases to support the transport in existing pipelines of hydrogen blended in natural gas at proportions of up to 20% volume. These projects include Hydeploy, a trial at Keele University that is looking at the use of blended hydrogen in existing gas networks.

Data from the Regional FES indicates that blended hydrogen will be injected by 2030 in the south west of England, and by 2027 in Wales. We have been supporting the Navigant Pathways project, coordinated by ENA, which is looking at a roadmap to decarbonise the gases in our network.

The project included the development of case studies demonstrating the impacts of difference pathways on consumers and networks. This has shown that the north of the country would be dominated by pure hydrogen and the south of the country – which includes our region – would be dominated by biomethane, with hydrogen clusters and blending in specific areas.

The hydrogen pathway comprises the following: North Wales is expected to be able to receive a proportion of hydrogen from the industrial North West Hydrogen Cluster; and in South Wales work is already underway to determine the feasibility of using hydrogen to support a regional industry cluster. We anticipate developments in hydrogen for industry that will support hydrogen for all loads in Swansea, Cardiff, Newport and Bristol.

While the single scenario (2018 FES) did not include any hydrogen for us before 2035, we believe that uptake will accelerate as outlined above to meet net zero. In our region this would impact North Wales in GD2, South Wales in GD3 and the M4 extension to Bristol during GD4.

9 BEIS Clean Growth: Transforming Heating – Overview of Current Evidence (December 2018).
10 UKCCC Net Zero Technical report (May 2019).
11 BEIS: Heat Networks: 2019 Q2 Pipeline, (August 2019).

Chapter 13. Our net zero ready vision for 2035 (continued)

The use of hydrogen will support decarbonisation by providing low carbon gas to customers who use it. Where hydrogen is blended with methane gas no action will be needed by customers to update their equipment and appliances. However, in the case of pure hydrogen, external enablers will be required.

The use of hydrogen supports whole system operation in the same way that natural gas does now, and its contribution to decarbonisation will support initiatives in other areas such as renewable generation and the use of hybrid heating systems to help the UK achieve its net zero ambition.

In addition, the use of power to gas means that hydrogen can support whole system balancing and reduce the impact of constraints to renewable generation that would otherwise be in place.

Click **Appendix 13M** for further details of the hydrogen proposals.

Investment required in GD2

The rate of repex will not be increased in GD2 above the planned mains replacement programme (Click **Chapter 16**). However, we believe that specific investment in this area will be required during GD3 to support hydrogen roll-out.

F: Low cost, low carbon distribution system

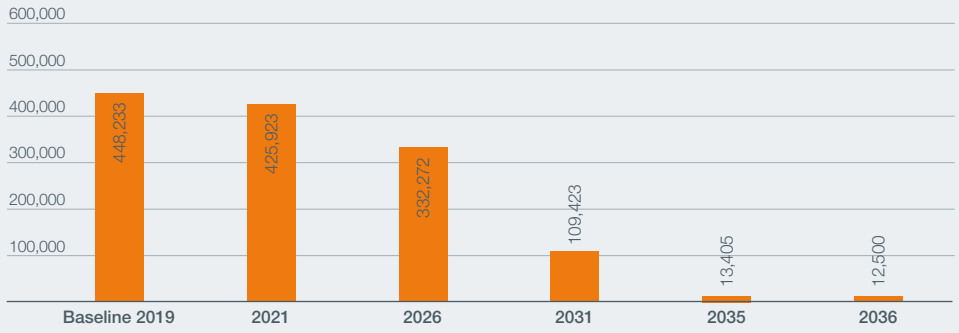
Renewing infrastructure will reduce carbon emissions and improve infrastructure long into the future.

As we outlined above, we will continue our mains replacement programme in GD2. This will support our net zero ambition in two ways. Firstly, by reducing leakage and the associated greenhouse gas emissions, and secondly by providing a network that is largely hydrogen ready to transport pure hydrogen.

By 2035 our network will be ready to transport pure hydrogen.

Figure 7 shows the forecast reduction in CO_2 equivalent greenhouse gas emissions as leakage from our network as we move towards full decarbonisation towards our net zero vision.

Figure 7: Greenhouse gas emissions (CO_2 equivalent)



The delivery of a low cost, low carbon system will help decarbonisation by reducing the amount of leakage in our system. At the same time the carbon content of the gas will be reducing because of increases in the proportion of green gas being injected into the network. The ability to transport a range of gases in the system will support whole system balancing, allowing decisions to be made about how different sources of energy in different regions can be used in the most efficient way. As mentioned above, our ability to accept hydrogen injection into our network will also help make the best use of renewable generation via power to gas technology when it would otherwise be constrained.

Note: These projections are based on: assumed completion of the mains replacement programme by 2032; increased work to reduce emissions from our above ground installations; and an increase in the proportion of green gas (including hydrogen) that is transported by our network based on an early view of our Regional FES project and supported by the findings of the Pathways project.

Investment required in GD2

We intend to increase the rate of repex in GD3 and we will have additional costs associated with recruitment and training to support this during GD2. As we approach transformation in GD3 we will also need to undertake specific work associated with rolling out pure hydrogen (over and above the work we have undertaken for mains replacement).

In GD2 we will participate in research and development to understand the impact of hydrogen and to seek ways to reduce emissions from our above ground installations.

GD3 repex preparation mechanism

	Work required	GD2 costs £m	Proposed funding mechanism
Repex preparation	Recruitment and training to support increased repex workload starting GD3	10	Net zero mechanism
Total		**10**	

Chapter 13. Our net zero ready vision for 2035 (continued)

G: System operability

Our network must be flexible to deliver our vision, with smarter controls, more dynamic operation and consideration of the whole systems impacts, especially with local electricity DNOs. We have plans to deliver new system requirements in relation to day to day monitoring, control and optimisation of our assets. These processes will become increasingly complex as we develop new gas injection strategies and more flexible gas usage. We have plans in place to address the increasing cyber risk and these are discussed in Chapter 20. We are currently working with the other GDNs and NTS to review how daily processes for calculating LDZ calorific values will be passed from NTS to the GDNs.

Investment required in GD2

The below investment is expected in GD2 and is valued as part of our net zero CVP. We have had increased requests for support in GD1 from third parties such as community energy projects and local authorities (in relation to their climate emergency declarations).

We expect this to grow in GD2 and will increase our manpower to facilitate third party research projects, aligning with our support of LAEPs.

Click **Appendix 13E** for further information on our work with LAEPs.

System operability improvements will help decarbonisation, enabling us to support new technologies, new gases and changing customer requirements. These improvements will help the UK meet its net zero ambitions, supporting whole system optimisation.

Click **Appendix 13N** for further information about system operability.

CVP net zero

This is valued as part of our net zero CVP in our renewable generation, decarbonisation of heat and transport models.

System operability funding mechanisms

	Work required	GD2 costs £m	Proposed funding
New IT systems/ functionality including:	Improve short, medium and long-term forecasting systems and increase visibility of our network and customer behaviour by linking data into control systems	1.6	Net zero mechanism
Increased manpower	This team will include a Director of FOE; Green Gas Development Manager; System Optimisation Manager; FOE Project Manager; FOE Project Officer; FOE Network Analyst; FOE Community Engagement	0.8	Net zero mechanism
Total		**2.4**	

8. Customer and stakeholder feedback

We have been a leading partner in debates around the future of energy – influencing and informing and listening at national, regional and local levels. This engagement has informed the 2035 vision and our investment proposals.

While customers want bills to remain affordable, they have identified the environment and decarbonisation as important priorities on which we should focus future investment planning.

There is also a wider sense from the public and organisations that represent them on the urgent need to address climate change – expressed for example through the declarations of climate emergencies by local authorities, universities and NHS trusts.

Government, policy makers and regulators

We work closely with high-level decision makers within government, regulatory bodies and other decision makers, including BEIS and the UKCCC, engaging around aspects such as smart hybrid systems and the use of hydrogen, and sharing the findings of the Freedom project.

We are pleased that our views are now being shared by decision makers, such as within the UKCCC's February 2019 Housing policy report, which endorsed smart hybrid heating systems and hydrogen cities as a low regrets pathway to the full decarbonisation of heat. As another example the Welsh Government's Head of Housing Decarbonisation has expressed a keen interest in considering a large-scale demonstrator of smart hybrid heating systems within social housing in Wales.

Other examples of our commitment to an informed debate include being the first network to present to the All Party Parliamentary Group for Energy Studies; we have also contributed to all phases of the Carbon Connect work. We are on the Advisory Board of Flexis and chair or participate in many other groups including the Institute of Welsh Affairs' project Re-energising Wales.

Other stakeholder engagement

We held two conferences (on green gas and distributed power generation) to share learning and best practice between networks, developers and other industry parties with a view to improving and aligning processes and gaining insight into future requirements for green gas and power generation customers. The key feedback was that stakeholders were pleased to have an opportunity to engage and share best practice and keen that gas networks should continue to work together and develop standard approaches where possible.

We regularly discuss future of energy developments with our Critical Friends Panel, including at surgery sessions for those who are keen to engage with us further.

We work closely with university academics to share practical industry knowledge and to learn from their theoretical research, modelling and expertise. We are currently sponsoring PHD students at the University of South Wales who are examining production of biomethane, making processes greener and more controllable. This engagement provides insights into the way technology may be heading and future opportunities.

Chapter 13. Our net zero ready vision for 2035 (continued)

We have routine discussions with our larger users and specifically contacted 14 of these customers around the interruptions auction. At the Regional FES workshops, attended by 20 key users, key topics discussed were their use of gas for power generation, their decarbonisation options, and implications of changes to gas quality specifications as we look to admit a wider range of gases into our network.

During early 2019 we conducted specific focus group sessions with stakeholders to test our decarbonisation strategies and to help us understand how customers feel about short-term disruption for long-term gain.

In addition, the CEG challenged our early strategy, commenting that it was too narrow and that it focused solely on heat and did not adequately consider scenarios from other sources. We have worked extensively with the CEG to explain our whole systems data and modelling. We have also significantly widened our GD2 focus to incorporate heat, power and transport and have increased our ambition to deliver a net zero ready network by 2035.

The RIIO-2 Challenge Group acknowledged the vision and challenged the fact that no action is being taken during GD2. They requested further analysis on the options considered and this is now contained in our net zero uncertainty mechanism.

Click **Appendix 5F** for further information on our engagement.

Engagement informing our commitments

Delivering a net zero ready network by 2035

Based on 22 engagements with more than 22,000 stakeholders, it is clear that our commitment is viewed as the right thing to do to help reduce emissions across the UK and for us to evolve as a responsible business. Our breadth of engagement includes our vulnerable customers, 43% of whom said that a sustainable future is the most important objective after reliability. Our domestic customers indicated that investment in innovative and greener technology is the second most important priority.

Our customer acceptability research from summer 2019 showed an overall acceptability of 64% for this commitment. Its relative importance in our willingness to pay research showed this as only 17th out of the 25 commitments; however, interestingly it came out as the 9th commitment customers were willing to pay more for.

There is clear stakeholder interest and approval for our projects (such as Freedom) supporting this commitment. Therefore, we are now recommending steps that would roll out this work, striving towards industry-wide decarbonisation. Based on this feedback and Government support, we are committing to delivering a net zero ready network by 2035.

> We've enjoyed working with Wales & West Utilities on Biomethane connections – these projects have the lowest cost, least complexity, and most capacity innovation within the GB market.
>
> Green gas stakeholder

Invest in innovation to support the national strategic energy challenges, working collaboratively with Ofgem, BEIS and the wider industry

Based on 20 engagement events involving over 22,000 stakeholders; it was clear that we should do more to inform our stakeholders on future energy and decarbonisation initiatives while ensuring that we are aligning with key players in the industry.

In addition it was clear that we should share information, such as the Energy Pathfinder tool, more widely to support the development of future energy scenarios. In our willingness to pay research SMEs scored this commitment higher than domestic customers both in terms of importance and perceived value.

Our collated feedback recognises that investing in innovation and working collaboratively with the wider industry to support national strategic energy challenges is an important priority to stakeholders, and we should develop our plans with this in mind.

Ensure that the investments we make today will support future energy scenarios and therefore represent a no regrets energy solution

Based on 15 engagement events, including over 22,000 stakeholders, we are seen as playing a central role in creating a sustainable energy future. Stakeholders are encouraging us to incorporate measures to achieve this in our planning. In particular the view of the Critical Friends Panel was that investment for a green future was a priority although there were concerns particularly in Llandudno and Swansea about whether the assets would be fit for purpose for emerging technologies in the future.

Our national collaborative engagement with experts highlighted that there is a delicate balance between low regrets and the need to act now. We are therefore committing to ensuring that the investments we make today will support future energy scenarios and therefore represent a 'no regrets' energy solution.

Chapter 13. Our net zero ready vision for 2035 (continued)

Future engagement

In GD2 we will continue our quarterly meetings with powergen developers, engagement with industry through our annual forecasting process, and our discussions with other developers wishing to connect to the grid.

We will undertake further research and innovation along with collaborative whole system projects such as Zero2050, a project looking at decarbonisation pathways for South Wales.

We will also continue to work with local authorities, as well as with SPEN, WPD and SSEN, to develop agreed scenarios for the areas where our geography is coincident.

Finally we will set up a Wales Green Gas Panel in Wales where we only have one connection to date, allowing us to promote best practice. We will also use our national collaborative engagement to widen our coverage and further promote biomethane across the UK. While we are not proposing a bespoke Stakeholder Engagement Incentive, our commitment to engagement in GD2 is explained in detail in Chapter 5 where this Wales Green Gas Panel is also explained further.

CVP net zero

Our £10m investment in heat innovation will deliver a consumer value of £82m in GD2, part of our net zero CVP.

Click **Appendix 13O** for more information about the future requirements of industry in our region.

9. Enablers to our vision

Innovation CVP

We anticipate that there will be a requirement for innovation projects to support this area of work during GD2 because of the significant change in this area. Projects are likely to be needed to:

- deliver low-cost modern energy services to allow customers to use energy in the ways they want to use it;
- maximise the adoption of technology that can demonstrate flexible, cross vector or low carbon technologies;
- deliver whole system solutions that enable no build options, both within and outside of our geographical region;
- implement the technology, methods and policies to deliver a net zero ready network by 2035.

Our commitment

Invest in innovation to support the national strategic energy challenges, working collaboratively with Ofgem, BEIS and the wider industry.

Financing options

As outlined previously, we believe that there should be an uncertainty mechanism that will support our net zero ambition while protecting customer bills and network financeability.

Any current licence obligations delivered through our current connections policy have been included in our BAU totex plan.

Third party enablers

While this chapter has focused on the investment that will be necessary for us to deliver our net zero ready vision by 2035, there are a number of areas where the actions of third parties will have an impact and where market forces will come into play. We have provided our forecasts of the key enablers below.

Our net zero timeline

Enablers		2019 Baseline	2021	2026	2031	2036*
Hybrid Heating Systems	BioGas Areas (Consumers)	70	500	120,000	300,000	625,000
	Hydrogen Areas (Consumers)	–	–	–	200,000	375,000
Off Gas Grid heating	Heat Pumps (Consumers)	2,100	3,200	25,000	75,000	130,000
DNO Investment Drivers	Peak Demand increase (%)	0%	5%	12%	27%	39%
	System Inertia %	70%	67%	64%	59%	55%
	Storage (MWh)	11,000	12,000	13,000	13,900	15,000
Renewable generation capacity needed (GW)	Wind	2.3	4.8	6	7.2	8.5
	Nuclear	1	1	1	1.1	1.2
	Marine	0.003	0.005	0.08	0.18	0.3
	Solar	0.14	0.23	0.32	0.41	0.5
Transport (thousands vehicles)	EV Cars	29	80	1,000	3,300	3,600
	EV EV Vans/LGV	1	2	18	200	400
	Electric Buses	0.03	0.05	0.4	3.5	9
	CMG Buses	0.04	0.25	0.5	2.5	5
	CMG HGVTrucks	0.17	2	7.6	12	18.8
Energy Efficiency	Demand reduction % on 2018 level	0%	3%	5%	10%	15%

* Data in this table is shown in the 5 year increments that reflect likely RIIO periods.

Chapter 13. Our net zero ready vision for 2035 (continued)

As part of this wider picture we recognise that our customers and other stakeholders have a role to play in delivering decarbonisation strategies by changing the ways in which they use energy and the quantities they consume. Support will be necessary for vulnerable customers and those in fuel poverty to assist them to make changes in their current arrangements.

The table below provides details of the ways in which enablers may be delivered during and beyond GD2. Significant discussion with industry and regulators would be required to determine the preferred approach and to confirm how it would be funded.

Enablers to consumer uptake of low carbon technology (eg hybrid heating)

Enabler	Description	Who pays	Pros	Cons
Energy supplier obligation	Energy suppliers deliver on their obligation by installing innovative measures to eligible households.	Immediate pass-through to all consumers via energy bills.	Proven methodology.	Sporadic Ad-hoc
Delivery provider auctions	Installers bid into a central process to win installation work.	Immediate pass-through via taxation.	An element of means testing through taxation processes.	Would compete against other departmental priorities eg education and health. Delivery risks around a centrally managed process and government funding.
Gas and electricity network obligation	Networks deliver on their obligation by installing innovative measures to eligible households.	Immediate pass-through to consumers via suppliers (included in the opex element of network charges).	Networks are experienced in delivering major projects and are delivering exceptional standards of service.	Sporadic Ad-hoc
ECO bank funding	An obligation to provide low-cost finance to customers.	Customer pays.	Eases the burden of initial upfront costs on consumers.	Little incentive exists for consumers to act. High delivery risk.
Network led roll-out	Networks lead installation of innovative measures to eligible households.	Funding through RAV and paid back over a lifetime of eg 45 years (included in capex element of network charges).	Networks are experienced in delivering major projects and are delivering exceptional standards of service.	New approach.

Conclusion

This chapter has set out our ambitious plan to decarbonise heat, power and transport in our regions, delivering a net zero ready network by 2035. We have a clear vision of the role our network will play, what needs to happen to facilitate this, and how much investment is required in GD2. We are confident that decisions taken now will avoid more costly solutions in future, and very much welcome the sense of urgency that has come from the Government's June 2019 announcement.

We propose a total investment of £150.9m, of which £140.9m form the basis of our net zero uncertainty mechanism and are valued as part of our net zero CVP at £4.3bn.

Finally, we are excited to be a part of a broadly defined whole systems approach that will provide the flexible and regional solutions that our customers are seeking for today and in future.

A summary is included below of the investment to be delivered through our uncertainty mechanism proposal.

Net zero forecast costs

	Work required	Cost £m RIIO–2	Cost per annum
Flexible generation			
PRI upgrades[1]	23	1.7	0.3
Pipelines for capacity and/or storage	85km	82.6	16.5
Below 7 bar reinforcement (MP and IP)	75 km	29.7	6.0
Total		**114.0**	**22.8**
Green gas			
Compressors	12	16.6	3.3
Smart systems	12	1.6	0.3
Total		**18.2**	**3.6**
Gas vehicles			
Reinforcement	16km	6.3	1.3
Total	**16km**	**6.3**	**1.3**
System operability			
New IT systems and functionality including: forecasting system upgrades and data controls		1.6	0.3
Increased manpower	Support net zero activities	0.8	0.2
Total		**2.4**	**0.5**
GD3 repex preparation			
Recruitment and training		10	2
Total estimate spend		**150.9**	**30.18**

1 This is included in our base totex proposals.

Chapter 14. Environmental Action Plan

1. Highlights of our plan

We care about protecting and improving the environment. We understand that our works can have a negative impact on the environment, but we are passionate about taking responsibility for sustainability matters in areas that are both within and beyond our direct control. We will work with our supply chain, partners and other stakeholder groups to deliver best practice and lead environmental innovation, demonstrating the benefit to businesses and society of protecting and enhancing the environment.

In GD2, our Environmental Action Plan (EAP) will drive our increased environmental ambition by addressing:

- Our Business Carbon Footprint (BCF)
- Decarbonising heat (as detailed in Chapter 13: Our net zero ready vision for 2035)
- Adapting to climate change
- Resource management/waste
- Sustainable asset management and procurement
- Natural capital

In GD2, we will significantly reduce our carbon footprint and drive down our consumption and waste generation, whilst laying the foundations for even further reductions within WWU and our supply chain in the future. We will also focus on new impact areas including biodiversity and air quality taking opportunities to maximise benefits to our customers.

Our alignment with the UN Sustainable Development Goals (SDGs) will help to ensure we are reducing our impact and encouraging others to do the same. The following section sets out the outputs and environmental benefits we intend to deliver.

Click **Appendix 14A** for full details on the EAP and supporting methodology.

CVP

Our EAP delivers over £3m of societal value in GD2.

Investing in our EAP:

Delivering a sustainable network, whilst keeping costs as low as possible for customers, has been a crucial consideration when producing our EAP. We believe that making good business decisions should go hand in hand with making great environmental choices. Delivery of the minimum EAP requirements, mandated in Ofgem guidance, make up the majority of the EAP cost, with approximately 40% of the costs coming from the employment of full-time reporting staff.

Special initiatives, over and above the minimum requirements, represent a low-cost approach and provide significant added value for customers. Special investments associated with tree planting and community activities over and above the minimum requirement represents £11 of social benefit for every £1 spent.

Other larger investments including our award-winning proactive land management programme are fully costed and appraised.

Click **Appendix 15A** for a catalogue of our CBAs and engineering justification documents.

Summary of the budgeted costs to deliver the EAP

Deliverables	Total Cost in GD2 (£m)	Average Cost to Consumers/yr of GD2
EAP	£2.65	21p
– Minimum Requirements	£2.30	18p
– Special Initiatives	£0.35	3p
Land Management	£6.80	54p

Note: Click **Chapter 13**: Our net zero ready vision for 2035 for details on decarbonising heat.

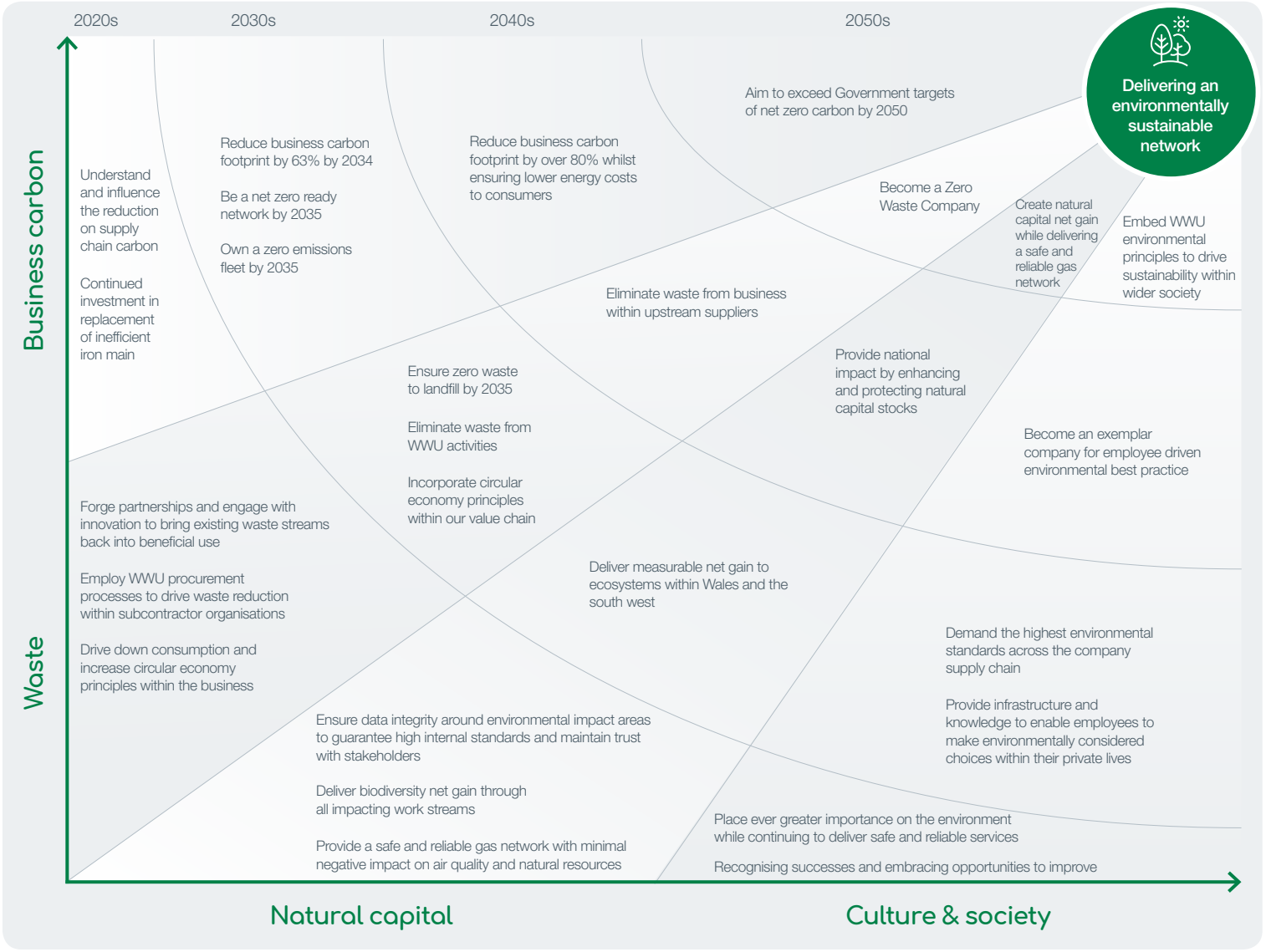
Chapter 14. Environmental Action Plan (continued)

2. Introduction

The environment remains high on the agenda for government, scientists, industry and stakeholders. There is also public concern over issues such as climate change, air quality and plastic use. It's important to us as a GDN to limit our negative and improve our positive impacts on the environment. In GD1, we have made significant strides to reduce our environmental impact by:

- reducing our annual BCF by 18% since 2013;
- implementing a comprehensive recycling scheme across our operational and office-based functions;
- delivering 85 land management outputs, significantly reducing the contaminated land risk to consumers and vulnerable water bodies;
- connecting an impressive 19 biomethane producers to the network;
- enabling flexible generation to provide back up for renewable energy sources;
- maintaining our ISO14001 environmental management system accreditation without a single major non-conformity.

Our EAP is ambitious. We have recognised our long-term environmental aspirations and worked backwards to define the steps required to meet them. In GD2, we will monitor and minimise the environmental impact we have within our communities. We will continue to exploit opportunities to make a positive impact, looking for innovative solutions to the challenges we face and working hard with internal and external stakeholders to ensure that our EAP delivers for our customers.



Chapter 14. Environmental Action Plan (continued)

3. Challenges and opportunities

In GD2, a wide range of challenges and opportunities will face us as we deliver a leading environmentally responsible and value-for-money gas network. Some of the more significant challenges include:

The increased amount of work taking place in Devon and Cornwall. We know that there are fewer local quarries and limited viable waste treatment facilities in this area. We also anticipate an increase in open cut techniques associated with the mains replacement work (Click **Chapter 16** for more details). This could lead to an increase in our BCF, the amount of spoil sent to landfill and the use of virgin aggregate against GD1 levels.

The rapid evolution of environmental improvements. Forecasting which new solutions will deliver the most benefit at a reasonable cost will be challenging. Our EAP has been developed based on working with stakeholders and what we already know.

Our continued reliance on national and local government to facilitate the right market conditions. Offering alternative gas connections to the network will provide significant environmental benefit; however, we cannot directly increase the volume of alternative gas ourselves.

Some of the more significant opportunities to achieve this include:

The increased global focus on environmental issues. This supports our mission to increase our ambition.

Technological advances will enable us to collaborate, innovate and influence stakeholders to deliver impactful solutions.

With over 23 councils in our network having declared a Climate Emergency, we can engage on a regional and local level with local authorities (LAs) and communities to support positive changes that matter to them. We will continue to support the development of Local Area Energy Plans (LAEPs).

Increasing our focus on changing behaviours at work and in our communities provides us with the greatest opportunity to generate wide-reaching environmental change. Through co-design, co-production and co-delivery of initiatives, we will create ownership and enthusiasm. Starting in 2020 and continuing into GD2, we commit to public reporting on the progress of our environmental initiatives outlined within the EAP on an annual basis.

4. Monitoring our impact

Reducing our carbon emissions, limiting our negative and increasing our positive impact on the environment.

Delivering a reliable, low cost gas distribution network can have a negative impact on the environment. Our Environmental Management System allows us to understand, monitor and continually improve our environmental performance.

We are proud to have achieved and maintained our ISO14001:2015 EMS accreditation with no major nonconformities throughout GD1. In GD2, we will embed our EAP within our EMS and commit to retaining our ISO14001 accreditation, supporting colleagues to meet our environmental ambitions. We continually seek to understand our environmental impacts and anticipate our main GD2 impact areas to reflect those in GD1.

We will continue to strive to reduce these impacts; which include, for example, emissions from shrinkage which have a significant impact on climate change, and the use of virgin aggregate as backfill which has an impact on resource consumption and climate change (soil sequestered carbon).

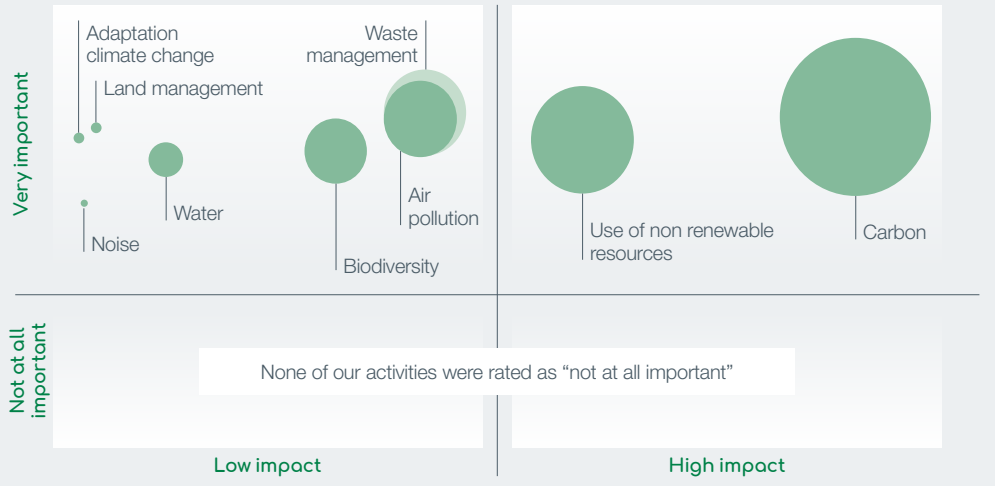
The assessment methodology for the EAP is primarily qualitative and is set out in the appendix. We have assessed options for our environmental activities in conjunction with our stakeholders and this process has led to the initiatives we are proposing.

We have reviewed our main activities and their environmental impacts against stakeholder views, as shown below; where the size of the circle reflects the number of activities that contribute to our environmental impact.

We have tailored our EAP to maximise the benefits to the environment and to our customers, based on a thorough understanding of our impacts and stakeholder expectations.

We do not currently have baseline data for new impact areas. Initiatives within existing impact areas are not specific enough to provide reliable forecasts. Baselines for the EAP will be collated from 2020.

Main activities and environmental impacts



Chapter 14. Environmental Action Plan (continued)

5. Consumer and stakeholder feedback

Our customers care about the environment and want us to act to make sure that they have clean, reliable and affordable energy. In fact, two of our customer personas, "Environmentally Considerate" and "Environmentally Engaged" make up 54% of our customer demographics.

Discussions with leading sustainability experts who have cross sector knowledge on carbon, biodiversity, the circular economy and resource management have helped to ensure our ambitions and targets are stretching, align with government policy and are scientifically robust. Customers were impressed that we are planning to align our EAP with the SDGs and sustainability came out as the third priority area that customers are willing to support financially.

Councils have suggested that we should remove trees where they present a significant risk to our pipe work and to replace them as part of urban community engagement programmes. Stakeholders want to see even greater engagement with parish councils in GD2 around local waste disposal opportunities, biodiversity and air quality.

The RIIO-2 Challenge Group has challenged our EAP level of ambition, as did the CEG, along with our limited engagement on this topic. In response to this, we undertook further engagement and as a result have increased the level of ambition significantly in terms of our net zero ready network, improving biodiversity and reducing emissions and waste.

We had not anticipated the challenge we received around our use of "plastic" pipes to upgrade older, leaky metallic pipes. We explained to customers that PE pipes last 80 years and that unfortunately recycled plastic pipes could not withstand the pressure required to maintain safety levels. We also explained that our pipe off-cuts are recycled into new gas pipes.

Engagement informing our commitments

Further reduce gas shrinkage by 10% against the 2021 target value of 454,000 tCO_2 through the continued replacement of over 400km of old metal pipe and 20,000 services – the equivalent of permanently taking 46,000 cars off the road.

Stakeholders have provided unanimous support for our work towards reducing shrinkage, as it impacts both the environment and the safety of our network. The Critical Friends Panel (CFP) highlighted that 97% of a gas operator's BCF stems from leakage and was very positive about our commitment in this area.

Stakeholders (both domestic and SMEs) expressed positive willingness-to-pay for this commitment before any other, highlighting the high perceived stakeholder value involving environmental repex schemes. CEG feedback and internal stakeholder support for carbon reduction, since October, has resulted in a pledge to undertake a trial that may provide an innovative solution to reducing pre-heat gas consumption.

Move 75% of company cars to hybrid or ultra low emission vehicles by 2026, explore green alternatives for our commercial fleet, and achieve a zero emissions fleet by 2035 – supporting biodiversity and improving air quality.

Whilst network leakage is the main contributor to our carbon emissions, stakeholders felt that we should not ignore smaller elements of our carbon footprint. This feedback very much supports our commitment to address company cars and our commercial fleet.

Our initial draft commitments in this area did not address our fleet, only our company cars which we were challenged about at a recent CFP, and subsequent internal stakeholder engagement has overwhelmingly supported reducing our carbon footprint. SMEs have shown a willingness to pay for our move to a green fleet.

A Westminster briefing with contributions from Natural England, Balfour Beatty, Network Rail and local authorities has given us beneficial insights into the protection and enhancement of biodiversity.

Chapter 14. Environmental Action Plan (continued)

Reuse and recycle at least 80% of our waste by 2026 and send zero waste to landfill by 2035, to achieve our ambition to be a zero waste company by 2050.

It is evident from our stakeholder engagement since our draft July plan that there is strong support for this commitment. Moreover, the CFP considers 80% recycled waste to be an achievable target. Acceptability testing has revealed that domestic customers are willing to pay for this commitment.

Challenge by the CEG and RIIO-2 Challenge Group, and internal stakeholder support since our draft October plan, has supported our increase in ambition around waste management.

Invest £6.8m to assess, manage or reduce the negative impacts of historical gas works at around 70 sites in our communities. We propose a bespoke price control deliverable to support this.

We know that stakeholders want us to be ambitious and reduce the less environmentally friendly aspects of our activities. Our proactive land management programme and the related GD2 commitment to assess, manage or reduce the negative impacts of historical gas works at around 70 sites has received a positive response from local authorities.

This ratification is important to us. We have amended our commitment in this area since the draft July plan and following feedback and acceptability testing as we wanted to make it more specific.

Click **Appendix 5F** for further information on our engagement.

6. Our GD2 focus areas

Delivery of our ambition is dependent on regulatory and governmental support. Here we set out our six EAP focus areas in GD2:

- BCF
- Decarbonisation of heat (Chapter 13)
- Adapting to climate change
- Resource management/waste
- Sustainable procurement
- Natural capital

Click **Appendix 14A** for details on options considered to arrive at our EAP.

Our commitment

Further reduce gas shrinkage by 10% against the 2021 target value of 454,000 tCO_2 through the continued replacement of over 400km of old metal pipe and 20,000 services per year – the equivalent of permanently taking 46,000 cars off the road.

Move 75% of company cars to hybrid or ultra-low emission vehicles by 2026, explore green alternatives for our commercial fleet, and achieve a zero emissions fleet by 2035 – supporting biodiversity and improving air quality.

75%

of company cars to be hybrid or ultra-low emission vehicles by 2026 to support our ambition for a zero emissions fleet by 2035.

Business Carbon Footprint

Reducing our BCF will assist the UK Government in achieving a zero carbon future.

Today's consumers, Shareholders and governments are demanding that businesses take responsibility for their carbon emissions, working towards a low carbon future.

Going into GD2, we have adopted a "science based target" (SBT) approach to our carbon reduction.

In line with best practice, we will be defining two science based target ambitions, one long-term target in 2050 and one short-term target, which will be within 15 years of the baseline. (Our baseline will be reset to 2020 following independent specialist review and verification of our BCF).

Our overarching, shorter and longer-term SBT ambitions are to reduce our GHG emissions by 63% by 2034 (1.5°C) and to be a carbon net zero company by 2050.

This represents an increase in ambition from the draft October submission, in response to RIIO-2 Challenge Group feedback and stakeholder mandate. This new ambition is aligned to our net zero ready vision for 2035 and associated funding requirements. Should funding be unavailable our short-term SBT ambition will be to reduce our GHG emissions by 37.5% by 2034 (2°C).

Chapter 14. Environmental Action Plan (continued)

We will achieve these by reducing gas and electricity consumption across our sites, investing in alternative fuelled fleet vehicles and addressing fugitive emissions (including shrinkage).

Audits of our offices and depots will continue whilst we look to invest in more environmentally friendly solutions and our mains replacement programme and pre-heat efficiency trial will help to reduce shrinkage.

Our ambition to be a net zero ready network by 2035 will see the continued replacement of metal mains to ensure the network is ready to accept alternative gas. During the 2020s, we will continue to innovate and take strategic steps to address smaller contributors to leakage.

Preparing for GD2

During 2020, in preparation for GD2, we will:

- undertake a review of our BCF, covering Scopes 1 – 3, with the support of external third parties to ensure our reporting is in line with industry best practice;
- develop simple tools to collate BCF data for internal and external use;
- begin implementation of Scope 3 and embodied carbon monitoring and reduction practice to test tools and assumptions;
- develop internal policies to ensure carbon reduction is integrated across the business and disseminated within the supply chain.

Our GD2 BCF commitments

In GD2, we will produce an annual environmental report verified by a third party expert detailing our progress against our BCF target.

We will be challenging business processes to efficiently and economically drive down our BCF through several initiatives.

Scopes 1 & 2 (direct emissions)

In GD2, we firmly commit to:

- **continuing with our mains replacement programme to reduce gas loss to atmosphere (shrinkage) by 10% by 2026.** Details on our shrinkage ambition is detailed within Chapter 13 (our net zero ready vision) and Chapter 16 (the distribution network);
- **ensuring 75% of company cars to hybrid or ultra-low emission vehicles by 2026, exploring green alternatives for our commercial fleet, and achieving a zero emissions fleet by 2035.** We will incentivise environmentally friendly company cars to influence behaviours towards zero emission vehicles and install electric charging points in offices and depots;
- **continuing to refresh the commercial fleet from Euro V (which is currently at 46% for cars and light commercial vehicles and 26% for heavy commercial vehicles) to Euro VI compliant vehicles over GD2**. We will be installing telematics that will allow us to track carbon emissions and driver behaviours from individual vehicles;
- **challenging our driving behaviours and reducing our carbon emissions associated with our non-operational travel by 5% by 2026**, where good driving techniques could provide significant fuel savings per year;
- **collaborating with third parties and distribution networks to understand the potential for alternatively fuelled fleet vehicles and tools, taking opportunities from initiatives delivered by the decarbonisation of heat strategies;**
- limiting our energy use; ensuring environmental efficiencies with all new properties are considered and installed.

Scope 3 (indirect emissions) and embodied carbon

In GD2, we will:

- Publicly report on and look to reduce our Scope 3 and embodied (embedded) carbon emissions.

Click **Appendix 14A** for our full EAP.

We will undertake a review of our BCF covering scopes 1–3, with the support of external third-parties to ensure our reporting is in line with industry best practice.

Decarbonising heat

Our GD1 successes

In GD1, we proactively facilitated 19 biomethane connections and voluntarily reported on a range of standards associated with responding to connections enquiries.

We also connected 31 flexible generation gas fired power stations supporting renewable energy creation, and future-proofed our network by investing to enable the supply of greener gas.

GD2 commitments and activities

We will continue to proactively facilitate the connection of green gas to the network by:

- challenging and reducing the cost to connect green gas to the network, ie using available intelligent management platforms (Optinet innovation project);
- investigating and collaborating with external parties on opportunities to establish compressed methane gas (CMG) fuelling stations within the network;
- proactively facilitating future hydrogen cities within our network.

Click **Chapter 13: Our net zero ready vision for 2035** for further information. 109

In GD1, we proactively facilitated 19 biomethane connections and voluntarily reported on a range of standards associated with responding to connections enquiries.

Chapter 14. Environmental Action Plan (continued)

Adaptation to climate change

Taking into account climate change will ensure we are preparing our network for future challenges and will inform our investment decisions.

We recognise the pivotal role we play in delivering a safe and secure supply of gas to our consumers. The risk from climate change has the potential to impact upon the resilience of our network.

In GD1 we developed a suite of innovative climate change impact mapping tools relevant to a wide range of sectors, alongside Landmark and Ambiental. The data set can be used to identify assets at risk in the near and long-term future and to plan appropriate and timely investment to proactively adapt in advance of an impact at the lowest cost.

In GD2 we will use up-to-date government issued climate change projections to assess the risk of climate change to the network. We will test our investments against climate change mapping to deliver best consumer value.We will work with other GDNs and the Energy Networks Association (ENA) to deliver to government a GDN holistic UK and network specific assessment of the risk.

We will send zero waste to landfill by 2035.

Resource management and waste

Reducing consumption, increasing the use of recycled material and reducing waste.

During GD1, we drove down consumption and reduced waste disposal to landfill, including diverting spoil from landfill and segregating operational and corporate waste.

In GD2, we plan to tackle our resource management by reducing our consumption and waste generation, further embedding circular economy principles within the business and challenging our contractors to increase their environmental focus. (Within this plan, we refer to waste as materials and substances that have no future beneficial use.)

Initially focusing on reducing consumption and diverting waste from landfill, we will achieve our overarching long-term ambition to be a zero waste company by 2050 and send zero waste to landfill by 2035.

In GD2, we will publicly report our progress within our annual public environmental report and aim to send a maximum of 20% waste to landfill by 2026 and deliver a minimum of 80% waste reused and recycled by 2026.

Activities and initiatives that will contribute to the above targets include:

Spoil

During GD2, we forecast more open cut excavation and work within rural areas, increasing spoil volumes.

Based upon the assumption that additional waste treatment facilities will become available in the south west of England, we will commit to reuse and recycle at least 80% of excavated spoil by 2026. We will look to minimise waste, reusing and recycling where possible. We will continue to pursue innovative techniques to avoid open cut, such as close fit liners and pipe bursting.

Virgin aggregate

Greater excavations may require greater use of virgin aggregate where LAs prohibit reuse within roadways. We will work with stakeholders to increase use of recycled aggregate where possible, committing to increasing use of recycled aggregate to greater than 20% by 2026.

Reduce office consumption

Implementing the waste hierarchy, we will reduce our consumption and invest in better disposal practices. We will reduce office waste by 25% by 2026, reduce paper consumption by 75% by 2026 and eliminate single use plastic by 2022.

Paper and plastic targets will exclude essential customer correspondence and plastics required to deliver a safe and reliable gas network. However, we will seek to collaborate and innovate within these complex areas to determine alternatives to current practices.

Polyethelene pipe (PE)

PE pipe and fittings contribute significantly to our Scope 3 BCF. All waste PE pipe is recycled and manufactured into new PE pipe. We have ambitions to limit PE gas pipe waste to 5% by weight by 2026.

Continuing to use re-banding and service pipe bags, we will improve our efficient use of PE pipe, thus reducing our BCF and consumption.

Hazardous waste

Hazardous waste has been systematically removed from our business. However, our remaining hazardous waste is typically associated with essential operational activities. Our aim within GD2 will be to focus on potential innovations to identify alternative processes or tools/materials to reduce our hazardous waste.

Our commitment

Reuse and recycle at least 80% of our waste by 2026 and send zero waste to landfill by 2035, to achieve our ambition to be a zero waste company by 2050.

We will reduce office waste by 25% by 2026, reduce paper consumption by 75% by 2026 and eliminate single use plastic by 2022.

Chapter 14. Environmental Action Plan (continued)

Sustainable asset management and procurement

Using resources in a more sustainable way.

The circular economy keeps resources in use for as long as possible, extracting the maximum value from them, then recovering and regenerating at the end of life. Circular economy principles already form part of our successful asset management strategy.

During GD2, we are committed to embedding circular economy principles into the business, making sure we:

- set clear performance requirements including reductions in embodied carbon;
- encourage collaboration and innovation;
- establish a minimum design life;
- demand a robust business case, taking a whole life cost approach;
- refurbish rather than demolish where possible;
- increase the minimum environmental standard procurement questions to include consideration of circular economy principles.

Supply chain reporting

Our updated procurement policy will require higher environmental standards from our suppliers (primarily focusing on embodied carbon reduction and the circular economy). See above sections for more detail.

It is our ambition that more than 80% of suppliers (by value) will meet the environmental standards within the procurement policy by 2026.

The number of suppliers included within annual reporting will incrementally increase across GD2, as tender events are completed.

In addition, to ensure that robust and reliable data is provided, we are committed to undertaking environmentally focused procurement audits of suppliers, focusing on the top 80% by value.

Preserving the natural capital CVP

Protecting and enhancing all areas of the environment through responsible and sustainable practices.

It is essential that, as a responsible business, we operate in a sustainable manner to protect and enhance our natural environment now and into the future.

Our GD2 plan focuses on the areas where we have the biggest impact and stakeholder endorsement: biodiversity, air quality and soil (the use of virgin aggregate is noted above in the waste section and below in contaminated land management).

Biodiversity

An increasing understanding of the importance of biodiversity protection has been demonstrated in recent increased legislative drivers, such as the Government's Defra's 25 Year Environment Plan. The principle of biodiversity net gain (BNG) is an approach that aims to leave the natural environment in a measurably better state than it was previously.

During GD1, our focus on biodiversity has centred around impact reduction and legal compliance, however, **our long-term ambition is to achieve natural capital net gain across all our activities by 2050 and deliver measurable biodiversity and ecosystem services net gain by 2035**. Within GD2, we will be aiming to achieve no net loss on monitored projects spanning all operational areas, with the ambition of **achieving BNG on projects from 2026**.

To achieve this, we are committed to making a measurable net gain contribution. Engagement with companies such as Network Rail has highlighted a potential need to trial the use of existing generic tools (such as the Defra Metric) to ensure it is accurate and robust when applied to projects outside of a typical development scenario. During 2020, we will begin trialling appropriate processes and metrics to ensure that we can deliver a reliable and accurate measure of our impact.

Chapter 14. Environmental Action Plan (continued)

Developing robust and accurate reporting

We need to make sure that we adopt a sustainable and best practice approach to BNG. We will apply the mitigation hierarchy, avoiding the loss of biodiversity that cannot be offset by gains elsewhere. Forging partnerships and engaging stakeholders will help us to achieve the best outcomes for biodiversity, making sure we are transparent about our progress and realistic about loss and gain.

Understanding, monitoring and promoting biodiversity and ecosystem services within our long-term land assets

We have over 10 long-term land assets; including our head office and depots. We are currently working with specialist ecological consultants to understand how we can increase biodiversity at our sites, providing increased quantifiable ecosystem services. Initial data on a sample of the sites indicated that our holdings may typically have 0.06-0.27 biodiversity units (Defra Metric 2.0) and 0-0.9 ecosystem services score (Natural England's Ecometric). Although, these metrics show limited current benefit, we see value in protecting and enhancing their cumulative contribution.

Our pilot project in Bristol will see a depot development being undertaken in a designated Site of Nature Conservation Interest (SNCI), allowing us to make a measurable contribution to Bristol City Council's Biodiversity Action Plan. As part of the development, WWU is ringfencing approximately 1.5 acres vegetated earth bank – in collaboration with local wildlife experts – to protect and enhance the benefits the site can provide to ecosystem services.

Our approach will incorporate biodiversity principles and we will follow the five step process of:

- identifying the presence of high value biodiversity;
- assessing the value of biodiversity affected by the project;
- engaging with stakeholders, to determine the most effective application of the mitigation hierarchy;
- re-assessing the BNG metric and delivering the project plan in light of any project variances;
- reporting on the works undertaken and the management plan required into the future.

We will initially focus on those projects where we will have the greatest impact, expanding to cover a greater proportion of our projects through GD2 and beyond. Our commitment is to develop and apply our biodiversity metric monitoring tool on designated projects.

Click **Appendix 14A** for our full EAP.

To ensure the integrity of the network, we are required to cut down trees. We recognise that this has a negative impact on biodiversity within our network and are committed to supporting afforestation across the network in long-term managed schemes. Therefore, in addition to the above BNG ambition:

We commit to planting five trees for every tree we cut down.

In GD2, we plan to engage employees and (as suggested during engagement with LAs on the business plan) school children, to plant trees within their urban environment. This will provide an excellent opportunity to increase biodiversity, improve air quality, engage children – and by extension, their communities – in the scientific benefits of nature.

CVP

CVP net benefit of £11 for every £1 invested in protecting and enhancing the environment

Society as a whole will benefit from this initiative, experiencing mental and physical health benefits as a result of living in a cleaner environment.

Air quality

Air pollution is not only a major risk to human health; it also has significant effects on the environment. During internal consultation, tackling air quality was highlighted as very important to our employees.

In GD2, we are **committed to understanding and minimising our impact on air quality.**

We will use specialist support to drive improved process and decision making in GD2 and will report on our progress.

In addition, we will contribute to improved air quality via the following initiatives:

- All street works will be planned with those at risk from poor air quality in mind, eg those suffering from asthma, heart disease, young children and the elderly.
- We will fulfil our vehicle commitments to improve the fleet and increase uptake of hybrid and ultra low emission company cars.
- Our biodiversity pledge to plant trees in both urban and rural areas will benefit air pollution. Trees absorb toxic chemicals, effectively filtering them from the air.
- Following engagement with a LA about our EAP, it was suggested we should liaise with them to understand where air quality management areas (AQMAs) are, and look to avoid them whenever operationally possible. We will adopt this initiative in 2020.

Chapter 14. Environmental Action Plan (continued)

Contaminated land management

We own a land management portfolio of 167 former gas production sites. The historical use of these sites has led to poor land asset health.

We have a duty of care under environmental legislation to ensure that our assets do not pose a significant risk of significant harm to human health, controlled waters (surface and groundwater bodies) and the environment.

Our assets are monitored and maintained as part of our long-term land management programme.

Our long-term ambition will see environmental risks reduced to a minimum and the divestment of all sites where appropriate to reduce ongoing costs to consumers.

Click **Appendix 15A** for our catalogue of CBAs and Engineering Justification Papers including details on our Land Management.

In GD2, we commit to delivering 85 land management outputs across 70 sites

We will achieve this through the continuation of our award-winning programme which is proactive and cost effective, adopting robust risk management techniques and taking opportunities to innovate and collaborate with stakeholders and communities.

The programme will benefit local communities and the environment long into the future and stakeholders have praised this proactive approach. We will also seek opportunities to promote BNG and reduce embodied carbon, challenging our supply chain by building the protection of natural capital and reduction of carbon into tenders.

Engagement with LAs revealed that some of our remediated sites could be of beneficial use to communities.

As such, we are committed to ensuring that all sites that are suitable for development are referred to local planning departments.

Our commitment

Invest £6.8m to assess, manage or reduce the negative impacts of historical gas works at around 70 sites in our communities.
We propose a bespoke price control deliverable to support this.

Cross plan carbon impacts

Carbon reduction contributions provided by wider asset management plans have been calculated in the cost benefit analyses (CBAs). The total carbon benefit claimed by the asset plans is 458,928 tCO_2e over GD2 and 21 billion tCO_2e by 2070. Full details of the carbon benefits claimed are tabulated in the Environmental Action Plan.

Click **Appendix 14A** for the full version of our EAP.

167

We own a land management portfolio of 167 former gas production sites.

£6.8m

Invest £6.8m to assess, manage or reduce the negative impacts of historical gas works at around 70 sites in our communities.

Chapter 14. Environmental Action Plan (continued)

7. Summary of our GD2 outputs

Environmental outputs — Click **Appendix 3A** for further justification on these outputs

Measure and type	Explanation	Proposal/target	Stakeholder views	2018/19 performance	Comparative performance	Other requirements	Customer benefits
Common output measures with a common target							
Annual Environmental Report LO	A new LO requiring GDNs to report their environmental performance through BCF reporting.	We commit to new annual reporting in line with the regulatory requirements.	Environment is an increasingly important priority for our customers who support the reduction of our impacts on the environment.	New.	New requirement.	Further work required with Ofgem to define this output. In addition we are proposing wider reporting against the Sustainable Development Goals.	Customers and stakeholders will have access to information to better understand our environmental performance and our contribution to a greener energy future.
Common output measures with bespoke target							
Environmental Action Plan initiatives PCD	A PCD to support GDNs to minimise their environmental impact and reduce their BCF.	We propose long-term ambitions and interim targets with significant collaboration with a wide variety of stakeholders.	Our CEG has challenged us on our environmental ambition which has resulted in wider and tougher targets following engagement with customers and colleagues.	New.	New requirement.	Further work required to refine initiatives and derive robust reporting protocol.	Our customers will benefit through improved health and the environment achieved by reducing our BCF which impacts air quality and biodiversity and limiting waste and resource consumption. The EAP initiatives will return £11 in social benefits for every £1 spent.
Shrinkage ODI F and R	A financial and reputational ODI to measure the volume of gas lost (GW/h) through leakage, theft of gas and own use gas.	Reduce gas shrinkage by 10% – 31 GWH less per annum by 2026. Made up of 51GWh reduction from mains and service replacement (reputational ODI). Offset by an increase of 20GWh from raising systems pressures (financial ODI).	Customers want us to reduce emissions quickly by accelerating repex – this is not supported by local authorities due to disruption and is not deliverable due to labour availability. There was strong customer support to reduce emissions by 10% against the 2021 target value.	351.5GWh total emissions.	Comparisons are difficult to make due to the large difference in both the asset base between the GDNs, as well as the way in which the asset base was designed to operate.	Continue to improve shrinkage modelling through collaborative work with suppliers and GDNs. Further work on evaluating the positive impact on carbon footprint of connecting green gas. System pressures will be dependent on the levels of mains insertion and customer demand.	Our shrinkage targets will deliver a significant reduction in carbon footprint, key to the UK's net zero ambition. Gas lost through transportation is c.1% of the UK carbon footprint so any reductions are significant to the UK achieving the 2050 net zero position.
Bespoke output measures							
Land remediation PCD	A suite of outputs to continue our programme of managing and cleaning up old contaminated gas works sites.	To deliver 85 land management/ remediation outputs in GD2 across 70 sites (GD2 cost £6.8m).	Our customers care about the environment and support work to clean these sites and bring them back into use.	So far we have delivered 85 of the 86 land management/ remediation outputs to be undertaken in GD1.	Not comparable.	Our proactive approach minimises the cost of managing our portfolio of land compared to a reactive approach. We also have an ambition to reduce our carbon and biodiversity impact within land management projects.	Our contaminated land assets deteriorate with time and risks can increase with changes in the surrounding land use. This output proactively looks to reduce significant risk to consumers' health and the health of the environment in which they live.

Conclusion

Our Environmental Action Plan is founded on internal and external stakeholder expectations of what a responsible business must do to protect and improve the environment.

By committing to globally recognised UN SDGs, in addition to Ofgem reporting requirements, we are publicly affirming our intention to become a leading business, tackling key environmental issues facing us on a local, national and global scale.

Our track record gives us confidence that we'll deliver positive outcomes for our consumers and stakeholders; focusing on areas where we can have a high impact at low cost and alter behaviours to produce long-term results.

Our approach is designed to deliver value for money for current and future consumers; carefully determining the most effective targets and strategies to implement, and the right time to implement them.

E

Maintaining a safe and resilient network

This section of our business plan sets out the proposed investments we will make in order to ensure that we can provide reliable, high-quality services both today and in the future.

We see resilience as encompassing the way in which our assets are run, the ability of our workforce to respond to and adapt to changing customer expectations and new technologies, and the resilience of our assets in terms of cyber and physical security.

A key aspect of all of these investment plans is that they will support and facilitate the changes that are taking place in the energy market currently and are set to continue through to 2050.

In this section:

15. Asset resilience 138
Our high-level asset strategy including summary information on workloads and costs including Network Asset Resilience Measures (NARMs).

16. The distribution network 148
Investment in mains and services replacement, multi-occupancy buildings, special crossings, and repairs.

17. Connecting homes and businesses 164
Investment to connect homes and businesses to our network including service disconnection, alterations and mains diversions.

18. Transmission and pressure management 173
Investments in our transmission assets including holders, pipelines, pressure reduction installations and governors, including physical security.

19. Workforce resilience 181
Our strategy to ensure that we attract and retain the right people over the longer term.

20. Cyber resilience 188
Technical and organisational cyber security measures to prevent and minimise the impact of incidents on our services.

21. Business IT security plan 189
Our plans to identify, prevent, detect, respond to and recover from a cyber attack or data breach.

Chapter 15. Asset resilience

1. Highlights of our plan

- **Based on the feedback we have received from stakeholders and customers, our strategy for GD2 is to maintain the health of the assets at current levels** and to offset any deterioration. This will ensure that consumers continue to benefit from what is an extremely reliable and safe gas network.
- **We are one of the top performing networks in developing innovative techniques to manage and prolong the life of our assets**. Most of our GD1 outperformance resulted from our innovation in this area. We shared the lower costs that resulted with our customers. As these savings are enduring our customers will continue to benefit from them into GD2.
- **We were the first gas network in the world to achieve accreditation to ISO55001 (in 2013)**, and have continued to maintain compliance since. This accreditation recognises our strong leadership and acknowledges that our asset investment strategy is understood and embraced at all levels of our organisation.
- **Our strategy has been, and continues to be, to maintain our assets at the lowest whole life cost**. We make investment decisions based on high-quality data and on sophisticated predictive and prescriptive analytics. In this way we manage risk, keep costs as low as possible and ensure that there is no 'gold plating'. We also ensure that all investments we make are robust against all credible future of energy scenarios.
- **We are proud of our 6th successive RoSPA Gold Award**, maintaining RoSPA Gold Medal Status (which is awarded after five successive Gold Awards). We are the only network currently holding this achievement. We also won the RoSPA Oil & Gas Sector award in 2019 for industry-leading health and safety performance.
- **An important part of our strategy is the value we place on collaboration and partnerships** – by working closely with many others we share best practice and innovation and stay at the forefront of asset management.
- **We value our people and they take pride in maintaining their competencies** and in keeping us at the leading edge of asset management.
- **Our strategy has evolved to face new challenges such as cyber resilience**, increased security threats and closer integration of the gas and electricity networks as we deliver the energy network of the future.

At a glance: Investing in our assets

Investing in our assets

Per year	GD1 (£m)	GD2 (£m)
Distribution	90.2	99.4
Connections	19.9	21.5
Transmission and pressure management	24.1	26
Total	**134.2**	**146.9**

Detailed explanations of cost movements can be found in the respective chapters. The key drivers are as follows:

- Distribution – an increase in labour costs and fewer opportunities to insert mains due to reduced capacity in networks.
- Connections – an increase in customer driven diversions and reinforcement based on stakeholder feedback.
- Transmission – a requirement to fully replace a 13km pipeline because of issues with its condition and because refurbishment is no longer a cost-effective option.

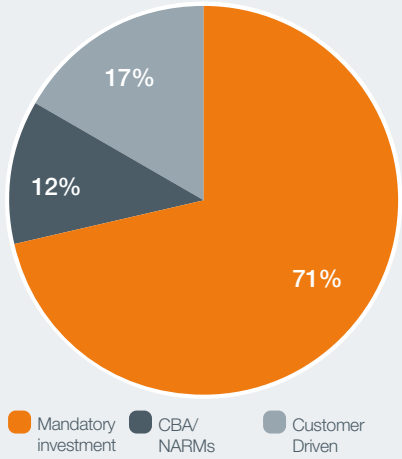
Investment drivers

Investment drivers can be broadly split into three categories: mandatory, discretionary and customer driven.

- Mandatory investment is required to comply with the law of the land.
- Discretionary investment is to deliver a stakeholder required outcome or is driven by Cost Benefit Analysis (CBA)/NARMs.
- Customer driven investment is as a direct result of customer requests to connect to our network or to move our assets.

The figure below illustrates the split of these drivers.

Investment drivers



We have an excellent track record of delivering investment and work of this nature. Detailed delivery risks and associated mitigations are set out in the CBA documents appended to this business plan.

Click **Appendix 15A** for a catalogue of our CBAs and engineering justification documents.

Chapter 15. Asset resilience (continued)

2. Introduction

The network of assets that we own and operate is critical for a reliable energy supply in Wales and the south west of England, today and in all credible future energy scenarios. This is vital for domestic and commercial users.

The way in which we manage and operate the assets is driven by stakeholders' expectations and by legislation. When making decisions, we take account of safety, reliability, the impact of our assets on the environment and customer satisfaction. In doing so, during GD1 we were able to meet all of our stakeholders' requirements in terms of the level of safety, reliability and connections.

This chapter sets out our high-level strategy; detailed information about each asset group is provided in the chapters that follow.

During GD1 we were able to meet all of our stakeholders' requirements in terms of the level of safety, reliability and connections.

During our 'Let's Connect' campaign, 68% of consumers felt that keeping interruptions to their gas supplies to a minimum was 'very important' (80% for those over 65).

3. Customer and stakeholder feedback

We have put in place a targeted engagement strategy with key stakeholders to inform our asset plan. As well as engagement with our general consumers, this includes talking to industrial users, the renewables sector, developers, local authorities, other gas transporters and GDNs, the electricity networks, and BEIS. We also undertake ongoing engagement with the HSE, which mandates much of our investment.

The following chapters (16 to 18) set out in more detail the results of our engagement on our specific asset investment and connection plans.

Our intervention plan is a response to our stakeholders' required outcomes in terms of safety, reliability and the environment.

During GD1 safety has consistently been reported as a priority for our customers and this, alongside reliability, has been confirmed in our most recent research. During our 'Let's Connect' campaign 68% of consumers felt that keeping interruptions to their gas supplies to a minimum was 'very important' (and for those over 65 the figure was 80%).

This was further confirmed in our surveys, with vulnerable customers saying that maintaining a safe and reliable supply was their top priority.

We have also acted on feedback from the independent CEG, most notably on a challenge in relation to the way in which we bring the needs of vulnerable customers into our asset investment decision making. We have now mapped our PSR to meter points, and our meter points to assets. This means we can assess the risk of asset failure on the vulnerable in our network and manage this risk appropriately.

The CEG also challenged us to demonstrate how the different workload drivers impacted on investment and how this linked to monetised risk and ultimately to benefits for consumers. We recognise that this is a complex area and one that we have spent time discussing with the CEG; our business plan has been updated accordingly.

We also take account of the more general steer from the public, for example in their response to the electricity outages over Christmas 2013 that were the result of a severe weather event. This resulted in £4m of compensation being given and a government inquiry being set up in response to the public outcry. This indicated that society in general is unwilling to experience disruption and that a reliable supply of energy is of paramount importance.

It is clear from public reaction to the fire at Grenfell Tower and from other safety incidents that the public expects a high level of safety performance from companies such as ours.

We have engaged extensively with the other GDNs and with National Grid Gas Transmission to share current and future challenges and to inform each other's strategies for the benefit of consumers and the public.

Our asset strategy and investment plans have been shared with the HSE through six-monthly bilateral meetings with their inspectors and also through regular meetings with the HSE policy team.

We have partnered with ICS Consulting who are experts in asset risk management and optimising intervention strategies. They have played a key role in the water industry and our strategy has benefited from their insights into that sector.

They have helped develop our risk modelling which links asset performance to customer outcomes. So, for example, we can understand the benefits in terms of reduced customer interruptions that would result if we were to spend, say, £1m on a district governor.

This has helped shape our intervention plan to ensure that it delivers our customer requirements.

Engagement informing our commitments

Continue our risk-based approach to asset management on our network – with an effective monitoring regime endorsed by the HSE

We have undertaken extensive engagement around our risk-based approach to asset intervention on the network including deep dive workshops on monetised risk specifically. Based on 11 engagement events including more than 3,500 stakeholders, customers and stakeholders said that they would like us to ensure that we maintain our approach and the outcomes it delivers.

They also highlighted that this risk-based approach is not solely about replacing assets to ensure safe gas supplies, but also about proactively ensuring that the decisions we make are in the long-term interest and do not close off future opportunities.

Chapter 15. Asset resilience (continued)

Our willingness to pay research demonstrated that our risk-based approach to asset management was in the top three commitments that domestic customers were willing to pay for, and in the top four for SMEs.

As well as listening and learning from our stakeholders, we have used our influence to help steer the gas and wider UK energy industry forward to meet the future challenges of green, affordable and reliable energy.

As an example, in GD1, two of IGEM's presidents came from WWU and they have played key roles in the strategic direction of this organisation and the influence it has on the energy sector.

Click **Appendix 5F** for detailed information about our engagement.

The CEG challenged us to include vulnerable customers in our asset investment decision making.

4. Our GD2 commitments

Maintaining assets and infrastructure will ensure reliability and decrease BCF.

In summary, our GD2 approach to managing assets is to maintain levels of risk at a broadly flat rate and to make investments that will support the energy network of the future.

This approach will keep the chance of an unplanned gas interruption to 1 in 250 years and will ensure that gas incidents remain a very rare occurrence.

To do this we plan to invest and will:

- replace 2,179km of ageing metallic pipe and 86,740 connected services;
- refurbish or replace more than 8,000 of our maintainable assets;
- connect 50,000 new customers and enable the connection of a further 100,000 customers by third parties;
- lay 92km of reinforcement main to support new connections.

The chapters that follow set out further information about our GD2 commitments and the investment that will be required.

GD2 outputs

As outlined previously, we have achieved or exceeded all output targets in GD1.

Detailed output measures and outcomes relating to the performance of our assets and our success in new connections are detailed in the following chapters. At the highest level, our strategy and its success will be measured by:

- maintaining the ISO 55001 accreditation which demonstrates excellence in asset management, through continuous improvement;
- maintaining safety (through major accident hazard prevention);
- acceptance by the HSE of our GS(M)R safety case;
- review by the HSE of our Control of Major Accident Hazards (COMAH) safety report;
- maintaining system capacity sufficient to supply our consumers in the most severe winter conditions (achieving our 1 winter in 20 obligation);
- reducing our Business Carbon Footprint BCF from the gas network by 10%;
- maintaining the health and risk of our assets at the current levels accepted by our stakeholders – measured through the NARMs;
- ensuring that our records are accurate and up to date as the network changes.

► NARMs

Under Ofgem's guidance, GDNs have developed NARMs through GD1. NARMs play an important role in assessing the benefit of asset intervention plans across all sectors. Ofgem sees this as the primary measure for assessing the success of asset strategies and intervention programmes.

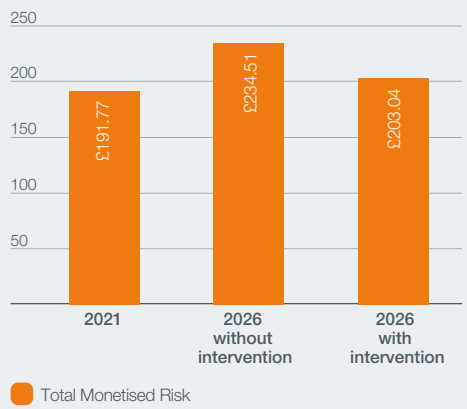
We forecast to outperform our NARMs target in GD1 by removing risk above our GD1 commitment, as a result of our targeted asset intervention strategy.

In essence, the risk posed by our assets increases over time as they deteriorate. Our investment plan has counteracted this increase in risk. We measure risk by monetising it.

Our plan is designed to keep network risk at the end of GD2 at a broadly similar level to the level at the start. We see GD2 as a key price control for learning from the NARMs assessment and for testing its potential as a benchmarking tool across networks.

The chart below sets out the level of monetised risk on our assets as we enter GD2, the level of risk if we do not intervene, and the level of risk achieved by delivering our GD2 investment plan.

GD2 Total Monetised Risk (£m)



Chapter 15. Asset resilience (continued)

The table below details the bespoke targets we propose for Ofgem's formal assessment and measurement.

Asset resilience outputs — Click **Appendix 3A** for further justification on these outputs

Measure and type	Explanation	Proposal/target	Stakeholder views	2018/19 performance	Comparative performance	Other requirements	Customer benefits
► Network Asset Risk Metric PCD/ODI	A common model across GDNs for calculating the monetary value of the risk of assets. This is used to assess the impact on risk from our intervention programme.	Monetised risk level of £203m*, maintaining current risk levels, counteracting the impact of deterioration of an ageing asset population.	Customers asked us to continue our risk-based approach to asset intervention whilst protecting the long-term interests. Our effective monitoring regime is endorsed by the HSE.	Using the current model, the monetised risk of our assets is £163m in 2018/19. Our investment in the final two years of GD1 will ensure delivery of the Ofgem target for 2021.	The measure is in its infancy and we commit to working with Ofgem and the other GDNs to develop meaningful comparisons and to continuously improve our own modelling.	Our ambitious plan to achieve a net zero ready network by 2035 will also have significant impacts on the level of monetised risk on our network in GD3 onwards.	Delivery of this output will keep network risk at the current level with no increase in safety, reliability or environmental risk. This will ensure that incidents such as loss of supply remain at very low levels.

* This cannot be compared with GD1 as monetised risk prices have been inflated for GD2 in line with Ofgem's guidance.

5. Our GD2 planned activities

Reducing costs and preparing our network for a greener energy future.

Improving the consumer and network user experience

Safety is paramount and the programme to replace our gas mains will mean that the risk of an explosion is greatly reduced, keeping our customers and the public safe from harm. We will continue to work with the HSE and other industry experts to make sure that our risk assessment is robust.

In GD2, we plan to invest £61.0m on average each year to deliver 324km of mandatory mains replacement, removing 34% of risk from the network and ensuring that 81% of our distribution network is plastic. In addition, we will invest in both non-mandatory iron mains and steel mains, both of which continue to be a focus point for the HSE. We will invest £17.1m per year to deliver 111km of mains replacement in this area. This totals an average of £78.1m per year for mains replacement.

In designing our programme, we make sure that we minimise any disruption to our customers. This focuses on working in an area only once to clear out all ageing metallic mains. This should mean that we do not return within most customers' lifetimes.

Finally, we ensure that we have the people in place to maintain our industry-leading position in managing our assets. We have invested in people to ensure that we have the range of skills, knowledge and behaviours to manage a safe and reliable network in the most cost-effective way. This includes network analysts, data scientists, system operators and capable leaders.

Supporting the energy system transition

Our strategy is to test our investment plan against all credible scenarios to make sure that our customers' money is spent effectively and efficiently and that we make no investment in assets that may become stranded.

To do so we use a combination of National Grid future energy scenarios and regional future of energy scenarios. Under each we consider the role our network plays and over what timescale.

We also publish Long Term Development Statements annually which reflect a more regional view on future demand forecasts. Details of our net zero ready vision can be found in Chapter 13.

We are obliged by our licence conditions to ensure that our network can supply gas to consumers on the most severe winter days. Our peak demand forecast increases slightly and our investment plans reflect this.

We have also ensured that our asset strategy aligns with our own vision for the future of energy. This entails using our network to enable green gases to enter the network and to provide flexible heating for renewable electricity. This investment has strong customer and stakeholder support.

We operate our network 24 hours a day, 365 days a year. We balance supply and demand to ensure that gas is safely provided to consumers in the most reliable and efficient way. We have already started making the changes necessary to balance supply and demand across our network, and this will increase during GD2.

We have gone from 17 feeds into our network to 36 due to new biomethane plants, and from 8 gas fired power stations to 37 in GD1.

We require investment in compression, pressure control, and storage in GD2 as this will allow us the flexibility we will need to respond to the rapidly changing shape of supply and demand (and which intermittent renewables are not able to deliver).

Information about this investment is included in **Chapter 13: Our net zero ready vision for 2035.** 110

Chapter 15. Asset resilience (continued)

Improving the network and its operation

Our investment will ensure that the current condition of our assets is maintained, in line with customers' clear preferences.

There are a number of factors supporting further investment, namely stakeholder required outcomes, legislation, and managing future supply and demand.

To support this, we have invested in and developed a Service Measure framework. This lists outcomes and outputs delivered by gas assets and their link to the asset's performance. To understand and forecast how an asset will perform, we hold considerable data relating to condition, deterioration, consequences if the asset fails, and the cost of those consequences. With this intelligence, we can review the impact of our intervention plan and therefore stakeholder outcomes. In summary, once we determine the stakeholder required outcomes, we can derive the lowest cost investment plan to meet those outcomes.

Our understanding of the investment we will need to make in GD2 has been informed by our understanding of external factors that could influence the performance of, and need for, our assets. This encompasses:

- growth in demand to ensure that our assets have the required capacity to supply gas when needed and heat homes on the worst winter's day; and that our new connections plan meets our stakeholders' needs;
- developments and infrastructure projects in the vicinity of our assets that require us to relocate those assets;
- climate change mapping to ensure that our assets can perform in the changing climate and investing where risks are significant.

How we assess and monetise risk

We operate a risk-based approach to managing and operating our network. We put a monetised value to risk which enables comparative analysis of risk;

- over time;
- between geographical areas;
- between asset groups;
- with and without different types of interventions.

Asset failure is defined as "any operation or function which the asset fails to correctly perform which gives rise to consequences". Failures are categorised into failure modes. As an example, a pressure reduction station could over-pressurise or under-pressurise a downstream network.

The probability of asset failure can be calculated to estimate the expected number of consequence events in any given time period, and the deterioration of this curve over time.

A 'failure rate' will be used to calculate the probability of failure. The failure rate gives the rate of occurrence (frequency) of failures at a given point in time. We have invested in condition surveys of assets and in systems to record faults and failures to inform our assessment of the probability of asset failure.

We apply the rate of deterioration to forecast future levels of risk. Using this future forecast of risk, we can optimise intervention plans to manage that risk.

Consequence analysis determines the nature and type of impact that could occur, assuming that a particular event (ie caused by asset failure) has taken place. When an asset fails, there will be an associated impact resulting from that failure (which is referred to as an event).

Our commitment

Continue our risk-based approach to asset intervention on our network – with an effective monitoring regime endorsed by the HSE.

An event may have a range of impacts of different magnitudes, and affect a range of different network assets and different stakeholders. For example, there could be a loss of supply to customers, or an injury, resulting from a failure. Such impacts are referred to as consequences of failure.

We categorise consequence into three main areas:

- Safety
- Reliability
- Environmental

We use a number of techniques to forecast consequence of failure:

- Statistical analysis of associated failure data.
- Hazard and operability study (HAZOP) techniques (risk assessment).
- Historic incident data.
- Geographic Information System analysis.
- Network analysis modelling.

We are in the process of upgrading our asset repository and reviewing data requirements for the 2020s and beyond. This will enable us to collect data at a detailed level, further improving our asset risk assessment and, in turn, our targeted intervention plan.

Our future survey plan is risk-based, with frequency determined by the current condition of assets and forecast deterioration.

Chapter 15. Asset resilience (continued)

The tables below detail the bespoke targets we propose for Ofgem's formal assessment and measurement.

► Summary of monetised risk assessment by asset group

Asset group	Probability of failure	Consequence of failure	Deterioration	Monetised risk start GD2 (£m)	Monetised risk end GD2 (£m) no intervention	Monetised risk end GD2 with our intervention plan
Offtakes and PRIs	All assets have condition surveys and a complete record of performance data.	Network analysis to determine supply loss and Geographical Information Systems (GIS) queries to people, buildings and infrastructure impacted following major loss of containment.	Derived from a series of elicitation workshops, supported by engineers and industry experts.	29.3	41.1	30.9
Governors	All assets have condition surveys and a complete record of performance data.	Network analysis to determine supply loss and GIS queries to people, buildings and infrastructure impacted following major loss of containment.	Weibull coefficients taken from a report prepared by SEAMS. Takes account of location (pit/housing) and distance to coast. Adjusted for effective age (based on assessed condition).	14.5	16.7	15.6
Pipelines	All assets have condition surveys and a complete record of performance data.	Network analysis to determine supply loss and GIS queries to people, buildings and infrastructure impacted following major loss of containment.	Weibull coefficients taken from PIE reports. OLI4 pipes use effective age (condition-adjusted age) to drive deterioration. OLI1 pipes use remaining wall thickness.	56.8	58.2	58.2
Mains	All failure data.	Site surveys to determine likelihood of gas in building following failure, historical incident data.	Non-PE. Exponential deterioration derived from modelled failure rates, split by material and failure mode.	63.9	82.4	67.9
Services	All failure data.	Historical incident data.	Non-PE. Exponential deterioration derived from modelled failure rates.	24.4	29.0	24.3
Risers	All assets have condition surveys and a complete record of performance data.	Site surveys to determine likelihood of gas in building following failure.	Expert opinion, aligned to the Services model. Separate deterioration for Non-PE (5% pa) and PE (0.5% pa).	2.9	7.0	6.0

Ensuring value for money

We make sure that we provide good value for money for our customers by extending the life of an asset, rather than carrying out capex heavy replacement programmes. We do this by understanding the life cycles of our assets and adopting a totex management plan, with multiple interventions.

We forecast the performance over time of each asset and the impact of intervention on that performance. This helps ensure security of supply and guards against asset stranding.

We also consider carefully the range of intervention options available and have a history of innovative approaches to extending the life of assets. As an example, we have developed techniques to restore ageing pressure management assets in order to prolong their continuing use through complex but low-cost capex refurbishments.

We have also delivered innovative solutions such as rebuilding river banks and redirecting rivers as a cost-effective alternative to expensive pipeline diversions.

We balance timing of investment based on asset risk, intervening only when necessary and, where risk of failure is low, intervening only on failure. This totex approach to asset management means we deliver the lowest cost management of each asset over its lifetime.

We have adopted different delivery models for different elements of our plan, each market-tested and benchmarked. The net result is a GD2 plan that costs c.£150m each year to manage what is an ageing asset base and to connect new customers.

When investing in existing or new assets, we take a long-term view of the future requirements of those assets. We apply demand forecasts to our network analysis models in order to assess the future usage and capacity requirements of our assets. Any investment decisions take future usage fully into account.

In cases where the future asset usage is set to decrease if we can remove the assets and avoid opex we will. However, the lowest-cost solution is often to leave the existing asset in place, even though it may not be being used to full capacity.

Chapter 15. Asset resilience (continued)

Testing the robustness of our investments in the longer term

We appreciate that the future of energy in the UK is not certain although there is a clear goal. We take our responsibility to invest on behalf of our consumers very seriously. This section highlights our approach to testing our investment plan against future uncertainty, ensuring that it supports credible pathways and avoids the risk of asset stranding.

The scenarios

We wanted to test our plan across a wide range of scenarios. Although the Ofgem sponsored cross-network common view of the future (single scenario) is useful, it only looks to 2030. We have used this to inform and test our GD2 connections and reinforcement plan but we wanted to test our management plan for our existing assets over a longer term.

Click **Appendix 15C** for more information on investment against FES.

To do this we have used the four Future Energy Scenarios (FES):

- community renewables;
- two degrees;
- steady progression;
- consumer evolution.

These represent, we believe, the extremes of future realities.

We have reviewed the 70+ assumptions underpinning each scenario for the impact on the gas network and on our gas assets. This has been done at a granular level – LTS pipelines, offtakes, PRIs, governors, below 7bar pipes, services and gas pipes feeding MOBs.

We have identified the assumptions that could impact on each asset group and taken a view on the role of the asset groups in each scenario over the short, medium and long-term (to 2030, 2040, 2050 and beyond).

CBA is a powerful tool in evaluating investment plans. The impact of any future uncertainty on our plan can be tested by varying investment payback periods. The analysis of FES and its impact informs these payback periods.

Click **Appendix 15A** for a catalogue of our CBAs and engineering justification documents.

The details of this analysis can be found in **Appendix 15C** although we have included an example scenario below. We have chosen this scenario as it represents the most challenging for future gas networks. All four scenarios are described in more detail in the appendix.

Community renewables

The community renewables scenario is based on a high level of decentralisation and a high speed of decarbonisation. This scenario has the lowest gas forecast and has therefore been used as an example as the worst case scenario for supporting investment in our network. To meet the decarbonisation targets there will be;

- a push for renewable gas by investment in improving the production technologies;
- a medium level of district heating;
- many small-scale, renewable and decentralised decarbonisation projects;
- the highest proportion of engaged customers.

The impact of community renewables on our network

An increased number of biomethane connections may mean a greater need for gas storage and compression to transport gas to where there is demand.

Example showing the impact of the community renewables scenario on our network

	2030s	2040s	2050s	Conclusion
Summary of scenario	Increase in heat pumps, significant increase in EVs and cessation of coal fired power.	70% of homes meet class C efficiency standards or higher, traditional gas boiler numbers are expected to decrease, 280,000 gas vehicles are on the road, 33 million EVs are on the road.	14.6 million residential heat pumps installed, 12 billion cubic metres (bcm) of green gas produced, natural gas vehicles will decline in favour of hydrogen.	
LTS pipelines	Minimal impact.	Capacity requirement may reduce but the LTS network is still required.	Capacity requirement may reduce further but the LTS network is still required.	CBA for asset health investment should consider payback periods of >30 years although capacity should be considered carefully.
Offtakes and PRIs	May require reinforcement to support flexible generation.	Capacity requirement may reduce but pressure reduction is still required. A small number of sites could become redundant.	Capacity requirement may reduce but pressure reduction is still required. More significant numbers of sites could become redundant.	Investments that do not pay back in 30 years should be challenged but investments paying back in 20 years pose little risk of stranding.
District governors	May require reinforcement to support flexible generation.	Capacity requirement may reduce but pressure reduction is still required. Some sites could become redundant.	Capacity requirement may reduce but pressure reduction is still required. Some sites could become redundant.	Investments that do not pay back in 30 years should be challenged but investments paying back in 20 years pose little risk of stranding.
Mains and services	May require reinforcement to support flexible generation.	As gas boilers are replaced there may be reduced capacity. As this is likely to be driven by individuals, it is unlikely that gas will be removed from whole streets or areas, so mains will still be required.	Increased use of heat pumps could start to see more mains and services become redundant.	Investments that do not pay back in 30 years should be challenged but investments paying back in 20 years pose little risk of stranding.

Chapter 15. Asset resilience (continued)

Adoption of district heating could make some mains, services and risers redundant if applied to existing buildings, decreasing the number of new mains and services if installed on new sites.

The scenario favours increased electrification of the rail network which may impact on the local transmission system, requiring either pipeline diversion and/or alternating current (AC) mitigation schemes.

A high proportion of engaged consumers are expected to adopt EVs. This is alongside a great number of renewables which may call for an increase in flexible power plants to enable a secure and reliable electricity supply.

Costs

The table below summarises the GD1 investment in comparison with our proposed GD2 investment.

Proposed GD2 investment in comparison with our GD1 investment

Work-type	GD1 (£m)	GD2 (£m)	Commentary
Replacement mains, services, MOBs and special crossings	72.3	80.2	Scheme size/insertion rates decreasing, therefore driving some cost increases. Labour costs increasing.
PREs	5.6	8.4	Workload broadly similar in GD2, with slight decrease due to lower repairs. Cost increase due to loss of meter work.
Repair	12.8	13.5	Slight downward trend in numbers due to repex programme – 1,360 per year by 2026.
Pipelines	3.4	7.9	Increase in diversions. Some additional work for AC mitigation (electricity network in proximity to our pipeline accelerating corrosion). 13km pipeline replacement.
Pressure regulation	10.9	9.3	Continuation of refurbishment strategy.
Maintenance	9.8	10.3	Continuation of refurbishment programme.
Connections	15.8	17.0	Reduction in fuel poor and small reduction in new to existing connections. Increase in LTS diversions.
Reinforcement	4.1	4.5	New main is broadly similar to current levels. Some investment in increasing capacity at pressure reduction stations.

Our commitment

Ensure that the investments we make today will support future energy scenarios and therefore represent a ‘no regrets’ energy solution.

6. Evidence

Maintaining our network by completing surveys and condition assessments.

Asset condition surveys

To ensure that we have high-quality data, since we were formed we have:

- Carried out more than 150,000 physical surveys to collect asset condition data.
- Undertaken tens of thousands of analytical operations to understand the consequences if assets fail to operate correctly.
- Delivered many data improvement projects, enhancing in the region of 200,000 asset records.
- Invested in cutting edge analytical tools to assess current and forecast future performance and associated risk of our assets.

Assessments of network health

As part of our commitment to improving the network and its operation, we undertake regular assessments of network health. We do so using a combination of condition surveys and fault and failure histories.

The table overleaf forecasts the health of each asset group at the start of GD2. HI1 assets are new, HI2 good as new through to HI10 which are end of life requiring intervention. This table shows that the PE network shows little sign of deterioration of failure, which is reflected in favourable health scores. By contrast, iron mains and steel services are towards the end of their lives and our investment plan reflects this.

200,000

asset records enhanced through data improvement projects.

Chapter 15. Asset resilience (continued)

Volumes – Total for population in PoF/Health indicator band

		Health (km or Nr)										
Asset category	**Units**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**
Pipelines	km	1,017	654	297	115	62	61	41	19	19	95	**2,382**
<7bar mains	km	24,352	0	1,642	79	62	0	1,139	31	0	5,334	**32,638**
Services	Number of	2,174,760	316,047	0	0	0	10,127	0	0	0	0	**2,500,934**
Risers	Number of	2,579	3,780	4,088	1,850	547	281	236	42	43	614	**14,060**
Offtake/PRI filters	Number of	5	23	49	38	67	36	14	36	12	52	**332**
Offtake/PRI regulators	Number of	8	30	66	68	37	26	27	16	12	72	**362**
Offtake/PRI pre-heating	Number of	7	36	52	29	23	14	17	9	4	22	**213**
Odourisation & Metering	Number of	6	5	5	1	1	1	1	1	0	13	**34**
District Governors	Number of	0	0	0	0	0	0	1	39	236	2,023	**2,299**
I&C Governors	Number of	0	19	79	207	122	91	49	16	9	15	**607**
Service Governors	Number of	0	1	1831	561	8,879	1,345	1,384	310	0	0	**14,311**

Forecast network usage

We forecast future customer demand and growth in our customer base in the short, medium and long term.

We use these forecasts in our assessment of the future use of our assets, future asset risk and new connection activity.

Click **Chapter 13: Our net zero ready vision for 2035** for more information. 110

Click **Chapter 17: Connecting homes and businesses** for more information. 164

7. Our digitalisation strategy

Data will assist us in investment decisions and help future proof our work.

Introduction

As digitalisation and 'the internet of things' grows, we believe that the use of data is key. Data and analytics are at the heart of our business decision making processes; we have invested in analysts and data scientists to unlock data's true potential in order to drive down costs and improve services for customers and stakeholders.

Data helps us provide more tailored services for customers, and allows us to share good practice and research findings. We are already highly dependent on data to provide our services and are becoming more and more data driven. We are strong proponents of data sharing with others within and outside of our sector and have been leading in this area. We therefore welcomed the Energy Data Taskforce's review.

We will achieve a modern digitalised energy system through collaboration.

Our overall approach

Our digitalisation strategy is published on our website. The strategy is based on a number of key principles.

- We support the Energy Data Taskforce's recommendations, as outlined in 'A strategy for a modern digitalised energy system'. In particular we support the two key principles: Principle 1: Digitalisation of the Energy System and Principle 2: Presumed Open.
- We value the importance of consulting with stakeholders to understand what data really supports the UK energy network and the transition to the future energy network. We have started on this work and will continue this into GD2.
- We currently make a very large amount of data easily available. Although much of this data has commercial potential, we make it available at no cost. This approach reflects our support of the principle of open data.
- We ensure that the data we publish is as useful and relevant as possible for consumers and stakeholders. We are transparent in our approach and make available our decision-making in relation to published data.
- We always maintain compliance with legislation covering the use of data, in particular the GDPR.
- When providing data to third parties we ensure that we adopt a robust approach to cyber security.

Click **Appendix 15D** for our published digitalisation strategy.

Our current data sharing

There are clearly benefits to sharing data within and beyond our sector and this is something we already do to a great extent; indeed we seek opportunities to do this where this will benefit the wider sector, subject to the principles outlined above.

Chapter 15. Asset resilience (continued)

- We share asset data readily. Interested parties can log onto an internet-based system and within minutes have access to our mapping data.
- We issue complete sets of our asset data to key stakeholders such as iGTs and green gas producers.
- We provide an on-line system for connection quotes – so that anyone who requires a gas connection can receive a quote through a simple internet-based process.
- We have shared our future of energy modelling tools such as the unique Pathfinder model with interested parties at no cost. This includes local authorities, other utilities including GDNs and EDNs, universities and other organisations that can play a role in delivering an energy network that supports net zero.
- We are undertaking leading work in data sharing agreements, with the aim of aligning the gas, water and electricity sectors into a virtual working common PSR while working towards a single PSR for all utilities in GD3.
- We publish our RRPs and our Long Term Development Statements and have published our TD13 calculator on our website.

We have a significant focus on data quality. We operate a dedicated data accuracy team and have many validations, checks and balances in our data collection systems and asset repositories. We also have data mining tools that are run regularly to highlight any potential data errors.

We operate a thorough Data Assurance (DAG) process to ensure the accuracy of any data shared outside of our business.

Our Network Analysis systems assess the impact of new connections to our network. Experienced analysts maintain these models to a high degree of accuracy through annual model validation processes. These models are used to ensure least cost reinforcement solutions for new connections where capacity is not available at the point of connection.

Our GD2 approach

We will use GD2 to build on our digitalisation strategy to date and to achieve a modern digital energy system through collaboration. We are currently undergoing a complete upgrade of our core systems, focused around updating our SAP product. We have a vision of ensuring that all asset and workload data will be centralised and easily accessible. This upgrade will be complete in 2021 and will significantly enable sharing of data to interested parties. This project puts us in a strong position for any national developments in relation to a shared system for hosting data.

We will continue to engage on an ongoing basis with our consumers and other stakeholders as current and future users of energy systems data to ensure that: we meet their requirements of our data; we anticipate their future requirements; and our open data is relevant and useful. As we move into GD2 we will keep our digitalisation strategy under review and ensure that it reflects their feedback.

In this regard we are already working with the gas and electricity sectors through working groups under the Open Networks project. This provides opportunities for publishing and sharing data to the benefit of gas and electricity customers and particularly new connectors. These groups are in their infancy but have potential to bring significant benefits in the energy transition.

We are also active proponents of the ENA cross-sector data group which is developing collaborative data-sharing plans. In support of this we will hold a series of joint stakeholder events in early 2020, the first of which is on 12th March 2020. The views of stakeholders at this event will shape the cross sector digitilisation strategy for GD2.

These discussions are at a relatively early stage so at this point we have not included additional base cost allowances to support significant industry evolution for data sharing or any other future commitments that are agreed collaboratively. If there are changes because of future stakeholder commitments with additional costs we would require additional funding. At this point in time, we suggest a re-opener mechanism to provide a funding mechanism to support this future possibility.

Click **Chapter 12: Dealing with uncertainty** for more information. 104

8. Innovation

We pride ourselves on keeping at the forefront of asset management. We were the first gas network to implement condition-based risk management tools. We have since implemented cutting edge Asset Investment Manager (AIM) software, which enables us to derive the lowest cost investment plan to deliver the required stakeholder outcomes. We have also upgraded our GIS and SAP systems to maximise our understanding of asset performance and risk. This enables us to optimise plans to manage risk and forecast future performance.

Our plans for GD2 include innovation in:

- Asset reliability on complex sites to ensure reliability at lowest cost.
- Sensors and a connected network to use data and systems intelligence.
- Robotic techniques to inspect and repair our network.
- Sensors and a connected network to use data and systems intelligence.

We have invested in risk based modelling and data scientists to better understand risk and reduce costs.

Conclusion

Our asset intervention plan begins with our stakeholder-required outcomes in terms of safety, reliability, and environment. Our excellent data and sophisticated analytics help us to derive a plan that delivers these outcomes at lowest cost to consumers.

We will deliver our Network Output Measures targets in GD1 and have set challenging targets to manage what is an ageing asset base in GD2.

Our structured approach is designed to deliver value for money for current and future consumers by helping to determine the right intervention on our assets at the right time to deliver the outputs stakeholders require; noting that expenditure and outputs are inextricably linked.

Chapter 16. The distribution network

£77.3m
a year to be invested in our mains replacement programme.

1. Highlights of our plan

- Stakeholders have told us that maintaining a safe, reliable gas supply is their number one priority and that they support initiatives to encourage more green gas to enter the network.
- The distribution network is now 73% PE, as a result of our substantial investment in replacing ageing and deteriorating metallic pipes. PE is a safe, low cost, and reliable material.
- The mains replacement programme has been delivered on time and below our allowance for GD1 – a significant achievement for a programme of this scale.
- The primary driver for mains replacement is public safety. The programme has significantly reduced actual, and the risk of future, gas explosions in the UK and we are committed to its completion.
- We are using sophisticated asset health and risk assessments to prioritise the remainder of the programme in the most efficient and cost-effective way.
- In GD2 we will invest £77.3m a year in our mains replacement programme. The investment will significantly offset future operating cost increases.
- We have been able to outperform in this area during GD1, through innovation, efficiency and beneficial cost factors[1]. This outperformance has been shared with customers. We anticipate that we will face higher costs in GD2 and this chapter explains in detail the reasons for this change.
- Importantly, our programme will deliver a network that supports our net zero ready vision for 2035 by accommodating hydrogen and synthetic gas (syngas), and by providing a low-cost network for hybrid heating solutions.
- In line with our net zero ready vision, we plan to replace all iron and steel distribution pipes by 2035[2].
- Our programme also brings considerable environmental benefits; methane emissions will be reduced by 10% in GD2, the equivalent of permanently taking 46,000 cars off the road. The mains replacement programme is core to our strategy to deliver a net zero ready network by 2035.
- We are targeting work to further protect those who live in Multi Occupancy Buildings (MOBs), recognising the importance the public places on keeping residents in these buildings safe.
- We will continue to carry out around 18,000 mains and services repairs a year on the distribution network as part of our strategy to manage these assets.

1 Further information about our GD1 performance is set out in our paper 'Mains Replacement Performance RIIO-GD1', which was submitted to Ofgem in June 2019.
2 Up to 2 bar operating pressure.

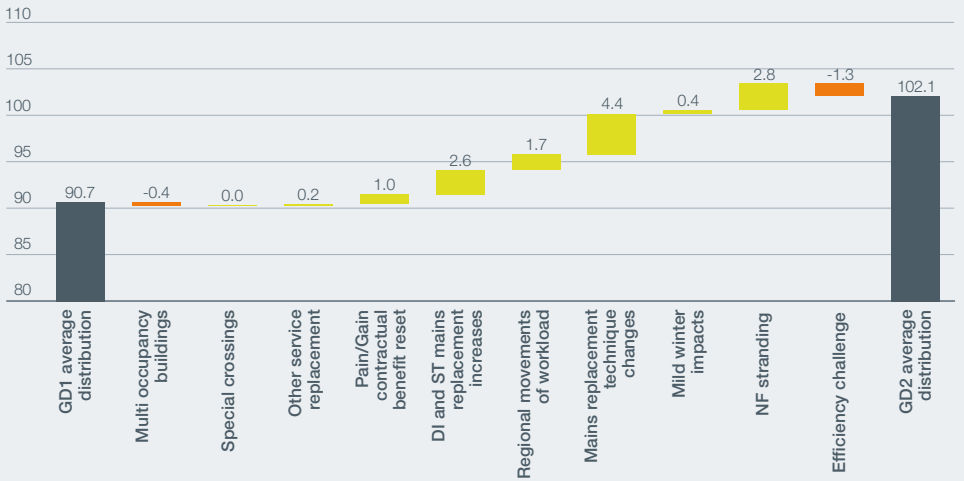
At a glance: investing in our network

Investing in our network

Deliverables	Expenditure GD1 (£m per year)	Expenditure GD2 (£m per year)
▶ Mains replacement programme	69.1	77.3
▶ MOBs	2.0	1.6
▶ Special crossings	1.2	1.2
▶ Other service replacement	7.2	7.5
▶ Emergency work	5.6	8.5
▶ Mains repairs	5.2	5.6
▶ Service repairs	0.4	0.4
Totals	**90.7**	**102.1**

The area of significant cost movement is mains replacement and we explain the reasons for this further in this chapter. In summary, the movement is a result of rising unit costs rather than workload changes.

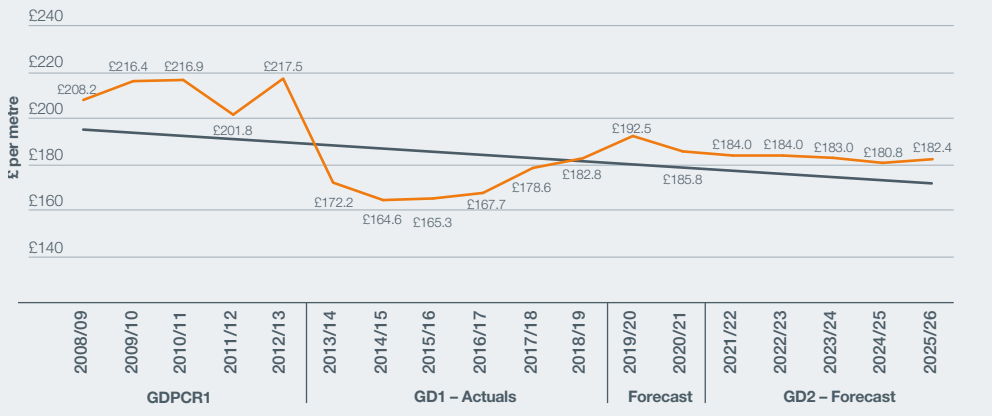
Distribution GD1 average vs GD2 average, 2018/19 prices (£m)



Chapter 16. The distribution network (continued)

The figure below shows how the unit cost of mains replacement has increased through GD1, primarily as a result of increasing labour costs. In spite of this increase, the level of costs in GD2 is still significantly lower than it was during the first gas distribution price control (GDPCR1). This is because of the innovations we delivered in GD1, which have brought enduring efficiencies.

Cost (£) per metre across GDPCR's in 2018/19 prices

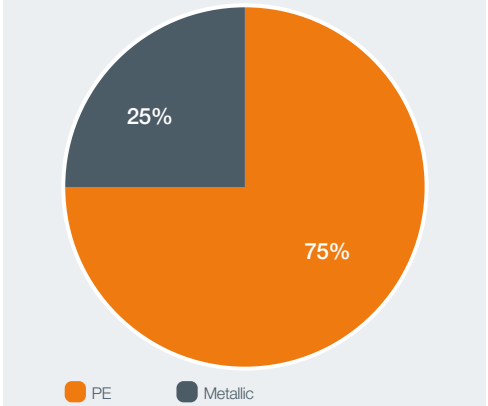


2. Introduction

The distribution network is made up of buried and above-ground metallic and PE pipes. We use the network to transport gas from the high-pressure transmission network to our customers' homes, businesses and small power generation sites. The pipes are generally located close to where people live and work, so our activities in this area are critically important to ensuring the safety of our consumers and the general public.

Our long-term vision is to replace the whole distribution network with PE, delivering a network that is very low cost to operate and is fit-for-purpose for transporting green gas in future energy scenarios. This chapter sets out how we will use the next five years to move further towards that vision.

Composition of our distribution network (as at 2019)



3. GD1 performance

Mains replacement represents, on average, around 40% of our total controllable expenditure each year. We therefore believe it is important to outline here our performance to date, and the benefits this has brought for customers.

- We have outperformed all of the outputs relating to the way we manage the distribution network. We have improved efficiency and consumers have benefited from a safer network and from lower levels of disruption from unplanned repairs.
- In particular, we have:
  - removed 7% more risk from buried mains than our target;
  - attended uncontrolled gas escapes in less than an hour over 98% of the time (against a target of 97%);
  - fixed over 50% of leaks in under 12 hours (against a target of 40%);
  - achieved better performance in interruptions for customers than was forecast, for both planned and unplanned interruptions;
  - made sure that when customers were interrupted, they were put back onto supply as quickly as possible;
  - reduced our carbon footprint by more than 18% by reducing leakage;
  - our analysis indicates that our investment in metallic mains replacement since 2002/03 has meant the avoidance of 148,000 gas escapes from our network (of which 15,000 are the result of fractures), 13,000 gas in building events, and six explosions, which is likely to have prevented six serious injuries and three deaths.
- We have delivered the commitments we made in our GD1 plan in relation to the diameters of the mains we have replaced; we have not defaulted to the less expensive smaller diameters.
- An essential part of our public service role is to attend gas escapes that are reported by members of the public. Through high-quality management, the use of planning tools, and strong contingency planning, we have achieved all output targets in this area.
- Our innovations in GD1 have significantly driven down the cost of replacing mains. These innovations include the use of 500m pipe coils and ductile iron cutting tools.
- By investing in data analytics and sophisticated control systems we have kept the pressure in our network as low as possible, while balancing an increasingly complex system. This brings environmental benefits as lower pressure means fewer leaks.

Chapter 16. The distribution network (continued)

In summary, without our investment and targeted risk-based approach, we would be operating a very reactive business with significantly increased risk and disruption to the public. This is demonstrated in the figure below.

Historical and projected impact of repex programme on repairs

As this shows, without the replacement programme we would be responding to more than 38,000 leaks a year (instead of our current rate of 18,000). Given the seasonal profile of leaks, we would require a repair workforce of around three times its current level to safely manage the higher risk of gas escapes.

Finally, as PE is suitable for transporting hydrogen and other green gases, our investment will support future energy scenarios and therefore provides the lowest cost pathway to decarbonising heat using hybrids.

We have built an efficiency value of £200k per year from the roll-out of pipe coil trailers for GD2.

4. Customer and stakeholder feedback

Engaging with partners to meet their requirements and positively influence local communities.

The HSE is a key stakeholder in our management plan for the distribution network, reflecting the fact that the key risk of the distribution assets is public safety. We are committed to delivering the iron mains replacement programme, which is mandated by the HSE, as this supports our own long-term vision to see all 'at risk' iron gas mains removed by March 2032. We hold six-monthly engagement sessions with the HSE policy team to discuss our strategy and management plans for these assets.

Stakeholders strongly support our activities to keep the network safe. At our regional workshops in 2018, 99% of stakeholders stated that ongoing investment in the gas network is important. Further research undertaken by Impact Utilities in 2018 demonstrated that safety was the number one priority. Stakeholders, including local authorities, support our proactive management to mains replacement, preferring this to a reactive approach. Additionally, mains replacement was one of the highest ranked commitments during our acceptability testing in 2019, at 62%, with broad consensus across geographies and age brackets.

The Customer Engagement Group (CEG) challenged the increase in repex costs which was in line with the challenge raised by the RIIO-2 Challenge Group. We have spent time explaining this, walking through unit costs and demonstrating what is changing and the drivers behind this. The CEG also challenged us to improve the way we presented the cost increases within our business plan.

We appreciate the time and effort that the CEG has invested in scrutinising this area of our plan and believe that the final presentation of the issues has been clarified and strengthened as a result. We have also included additional Appendix 16A and Appendix 16B.

Engagement on mains replacement activity

We engaged with all 42 local authorities in our region, recognising that mains replacement activities have a significant impact on our communities. They told us that our current levels of activity fit well with their plans, and that they would not wish to see increased levels.

They support our strategy of clearing areas of metallic mains in one visit, where practicable to do so, rather than returning and disrupting the same people. This conflicts with feedback during our qualitative deep dive sessions with customers who, when presented the options, were keen for us to invest more in mains replacement; all stakeholders agreed to spend 90 pence extra on the bill in this area, albeit that there was lengthy debate about the disruption this would cause (which is more in line with the feedback from the local authorities).

Local authorities also suggested that we should engage further with a wide group of stakeholders who are affected by our work. Following this feedback, we engaged with commuters on the subject of roadworks disruptions, where there was understanding that this work is necessary and that short-term disruption would give much longer-term benefit.

In response to feedback on minimising disruption, we have created a number of strategic planning groups. For example, we held a session in March 2019 attended by Transport for Wales, Welsh Water, WPD, Cardiff Highways Authority and Network Rail. We shared our long-term strategies and investment plans for the Cardiff region to coordinate more closely and minimise disruption to the public.

Engagement on our commitment

Our mains replacement engagement was focused around two elements, which form two separate commitments (safety and the environment). Our acceptability research during summer 2019 demonstrated that acceptability for both the emissions reduction commitment and the safety commitment was at 62%.

Our subsequent willingness to pay research concurred with that research in that both of these were in the upper quartile in terms of importance for domestic customers and SMEs. When asked about their willingness to pay, the investment for both commitments received high support, with reducing emissions being ranked as one of the top four commitments for our domestic customer group.

Based on 14 engagement events including over 23,000 stakeholders, we have gathered consistent feedback that safety and reliability of service alongside improving the environment are all of paramount importance. We also have broad support for our continued mains replacement programme, which delivers against all of these priorities.

Specific engagement on MOBs

We are very mindful of public concern towards risk and how this might be changing, particularly in light of the fire at Grenfell Tower, raising the profile of issues around safety and risk in high rise buildings.

We have engaged with all local authorities and building owners of high rise MOBs, asking questions on their plans for energy in the buildings and whether any planned work was likely. We also shared our own investment and management plans. This activity is enabling us to coordinate activities and to make sure that our plan reflects these stakeholders' requirements. As an example, Bristol City Council has an ambition to remove all risers from high rise buildings and we are committed to working with them in GD2.

Click **Appendix 5F** for further information on our engagement.

5. Our GD2 commitments

Reducing costs by minimising leakage, helping to create a more sustainable future.

During GD1, we have moved substantially towards having a network in place that does not fail; the need for us to react in response to leaks will diminish through the 2020s; and operating costs of mains repairs will fall too.

We will continue to build on this during GD2. In summary, we will deliver the following outcomes:

- Ensure continuing compliance with the HSE mandatory iron mains programme (to remove all 'at risk' iron gas mains by March 2032).
- Significantly improve safety for 520,000 people who currently live in the vicinity of an ageing metallic gas main.
- Counteract deterioration of the rest of the metallic mains network, offering the lowest whole life cost to consumers.
- Reduce environmentally damaging methane emissions by 10%.
- Maintain current levels of risk on special crossings and MOBs. Our management of MOBs may be influenced by the results of the Grenfell inquiry when this becomes available, and/or any change in government policy.
- Deliver a pipe network that supports all future of energy scenarios.

Delivering these commitments will result in increased costs as the programme becomes increasingly more challenging to deliver (the reasons for this are explained later in this chapter).

6. GD2 outputs

The outputs we will use to monitor and report on our performance are set out below.

► Distribution outputs — Click **Appendix 3A** for further justification on these outputs

Measure and type	Explanation	Proposal/ target	Stakeholder views	2018/19 performance	Comparative performance	Other requirements	Customer benefits
► Repex – tier 1 mains replacement ► Repex – tier 2a PCD	A programme of work that is mandated by the HSE to replace iron metallic mains within 30m of an occupied building by 2032.	Average of 324km per year in GD2.	HSE mandate this work. Our customers were keen for us to accelerate the programme but this was not supported by local authorities due to disruption levels nor was this deliverable given the labour market.	Average of 337km per year in GD1.	We are on target to deliver the mains replacement programme. However, other GDNs are facing challenges in delivering their repex programmes.	There is a cost challenge in GD2 due to labour, regional workloads and decreased insertion opportunities. We plan to increase the rate of repex in GD3 with preparatory work in GD2 to enable delivery of a net zero ready network by 2035 (subject to our net zero uncertainty mechanism).	Repex reduces the risk of an explosion, has significant environmental benefits and reduces unplanned interruptions.
► Repex – replacement of services ► Repex – mains TBC	The replacement of metallic services to comply with HSE guidance which does not allow a steel service to be reconnected following a mains replacement or to just repair a service following a leak.	To relay an average of 17,348 services per year and a total of 86,739 during GD2.	Our engagement on this subject was included as part of our overall engagement on repex.	Average of 17,300 a year in GD1.	Replacement volumes are driven by service numbers connected to mains in the replacement programme. As this is a function of the mains replacement, comparisons between networks are not overly useful.	To deliver a net zero ready network by 2035.	Replacing metallic services reduces the risk of an explosion and delivers environmental benefits and reduces unplanned interruptions

Chapter 16. The distribution network (continued)

In addition to these common output measures, we will also use the following metrics:

- Remove 28% of the total risk on the population, to be measured by the NARMS (monetised risk) methodology, which was explained in the previous chapter.
- Attend uncontrolled gas escapes in less than an hour and controlled gas escapes in less than two hours 97% of the time.
- Stop more than 50% of all leaks and 60% of high-risk leaks in under 12 hours.
- Reduce shrinkage and leakage by 10%.
- On record keeping:
  - Update the record of newly installed assets within 30 days of commissioning (D+30).
- Update record errors found on existing assets within 30 days of them being identified.

Our commitments

Further reduce gas shrinkage by 10% against the 2021 target value of 454,000 tCO_2 through the continued replacement of over 400km of old metal pipe and 20,000 services each year – the equivalent of permanently taking 46,000 cars off the road.

Significantly reduce the safety risk for over half a million people living in the vicinity of an ageing metallic gas main, by investing a further c.£400m in our mains replacement programme.

7. Our GD2 planned activities

Removing risk

In making decisions about where to direct our investment, we balance safety, ongoing operating expenditure, environmental impacts, and the relative efficiency of delivery.

Our sophisticated risk assessment process takes account of a large number of factors including: how likely a pipe is to fail, how likely it is that gas will enter the building, how likely an explosion will be, and so on. This provides an objective and accurate indication of the safety risk of each pipe. Importantly we put a monetised value to risk, which enables comparative analysis of risk:

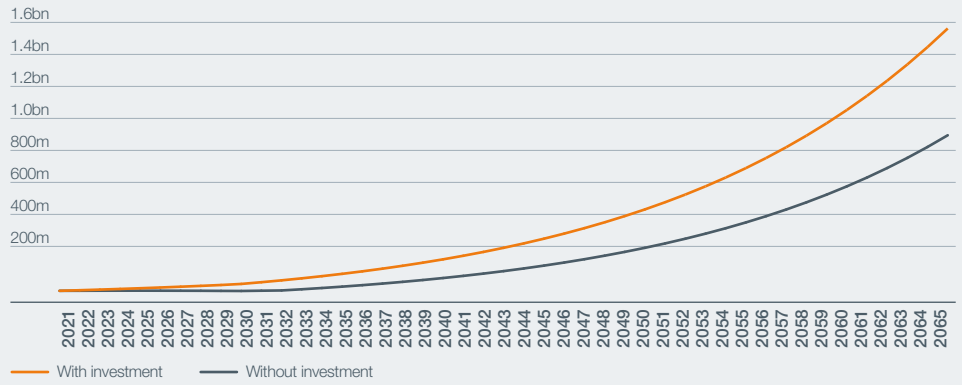
- over time;
- between geographical areas;
- between asset groups;
- with or without different types of interventions.

80%

of emergency calls relate to gas leaks in the customer's property.

Our investment plan will remove risk, as shown in the graph below. The x-axis is time and the y-axis is £s of monetised risk. It can be seen that investment in mains replacement will have removed £18m of risk by the end of GD2.

Impact of monetised risk, with and without investment (£ monetised risk)



Responding to and repairing gas escapes

We provide an emergency service, responding to all calls from the public relating to the smell of gas or other gas supply issues. Some relate to leaks from our network (around 18,000 a year). However, the majority relate to gas leaks downstream of the gas meter and on the customer's pipework or appliances (around 70,000 a year). In these instances, if we can fix the problem we will do so, and if not we ensure that it is made safe.

This is an essential service for public safety and we achieved all output targets in GD1, even during the year that included the extreme winter events of 2017/18.

Stakeholders tell us they are happy with this level of performance and do not wish to pay more to see it improve. We also see little value in the increased cost to improve these outputs. However, we do believe that prevention within a 12-hour target could be refined to place more focus nationally on higher risk gas escapes. Although this is not a common measure across GDNs, we will be keeping this as a Key Safety Performance Indicator within our business (as it has been in GD1).

We categorise repairs by the risk they pose and have tighter targets for high risk escapes, as illustrated in the table on the following page. The risk points are calculated using a mechanistic system that considers factors including the volume of gas detected in the atmosphere and proximity to buildings. We have performance targets that we monitor at Executive level.

Chapter 16. The distribution network (continued)

Our repair performance targets

L3 measure	Target
% of outside escapes over 400 points within 2 days	90.0%
% of outside escapes 250–400 points within 7 days	90.0%
% of outside escapes 20–250 points within 28 days	90.0%
% of outside escapes 0–20 points within 90 days	98.0%

As a result of our analysis, in GD2 we will:

- attend an estimated 431,000 public reported escapes. In recognition of the importance of this work to keep the public safe, we will maintain our performance on responding to escapes at >97% within one hour;
- improve our performance on repairing escapes within 12 hours. We are committing to achieve this at >50% of incidents in GD2 (compared with >40% in GD1).

Connecting green gas

Assisting the connection of green gas to our network.

There are a number of credible scenarios for the future of energy, including the use of hydrogen, blended hydrogen, biomethane, and syngas, along with more extensive use of hybrid heating systems.

Our investment plans deliver a pipe network that supports all such future scenarios. As PE pipework is capable of transporting any gas, investment in the replacement programme represents a 'no regrets' investment decision.

Reducing emissions

Our investment decisions are informed by analysis of the environmental impact of each pipe. Mains replacement is the most significant contributor to reducing emissions, delivering more than 90% of our emissions reduction in GD1 to date. This equates to a reduction of 214,000 tonnes of carbon dioxide equivalent (CO_2e) saved to date, and a total of 360,000 tonnes CO_2e forecast to be saved over the current pricing period.

Without mains replacement, we would fail to meet our emissions targets. We have set a challenging target for GD2 to reduce environmentally damaging methane emissions by 10% over the period. This is challenging given that we have an ageing asset base, a significant replacement programme to deliver, and a requirement to connect in response to stakeholders' needs.

We have invested heavily in ensuring that we keep pressure as low as possible and will continue to do so during GD2. We have started to develop the approach we use to accommodate increased levels of green gas feeding into our system. This has meant reconfiguring networks and running parts with revised pressure profiles that can be detrimental to leakage. Our Optinet innovation project is looking at the next generation of intelligent control systems to mitigate any impact on leakage, but also maximise green gas injection.

Click **Appendix 13J** for further information on our Optinet innovation project.

GD2 workloads

Replacing old metal pipes with new PE pipes will improve our network infrastructure and reduce carbon emissions.

Our investment of £102.1m will ensure compliance with the iron mains programme that is mandated by the HSE. It will also counteract deterioration of the rest of the metallic mains network, offering the lowest whole life cost to consumers.

The 2021-26 workloads required to deliver our stakeholders' requirements are as follows:

- 2,179km of mains replacement, of which:
  - 1,619km of Tier 1 iron (<=8").
  - 2.4km of Tier 2a iron above a HSE risk threshold.
  - 153.8km of Tier 2b and Tier 3 (iron>8").
  - 50km of iron mains over 30m from buildings.
  - 244km of <=2" steel connected to iron mains.
  - 110km of steel >2".
- 173,500 steel services replacements and PE service transfers.
- Special crossings, of which:
  - 320 crossing refurbishments.
  - 34 replacements.
- Replace 634 risers on MOBs.
- 430,603 public reported escapes (PREs).
- 50,000 mains repairs.
- 32,500 service relays after escape.

These workloads are broadly similar to those of GD1. This is not surprising as 90% of our planned mains replacement is mandated by the HSE and all emergency, repair and service replacements are a requirement of HSE. Workload changes are detailed in the following sections.

Our commitment

Attend gas emergencies in under an hour, on average, to keep our customers safe.

The HSE will not accept refurbishment of buried iron so there is no option but to replace these assets. We will measure delivery by length replaced and by monetised risk reduction.

>£100m

investment each year on our distribution assets.

Chapter 16. The distribution network (continued)

Mains and service replacements

To achieve our HSE mandated iron mains replacement requirements and to meet our stakeholder requirements, we plan to replace 2,179km of iron and steel mains and 86,740 attached steel services.

Mains and service replacements

	Category	GD1 average year	2022	2023	2024	2025	2026	Total
Mains (km)	Tier 1	324	323.9	323.9	323.9	323.9	323.9	1,620
	Tier 2	29.0	29.0	29.0	29.0	29.1	29.0	145
	Tier 3	2.2	1.9	2.0	2.0	2.8	2.4	11
	Over 30m	10.0	10.0	10.0	10.0	10.0	10.0	50
	Consequential steel	48.8	48.4	47.6	48.1	51.6	48.2	244
	Other steel	22.0	22.0	22.0	22.0	22.0	22.0	110
Total		**435.96**	**435.3**	**434.6**	**435.1**	**439.4**	**435.5**	**2,179.8**
Services[3] (number of)	Repex services – transfer	17,348	19,197	16,449	16,046	18,115	16,932	86,740
	Repex services – relay	17,348	19,197	16,449	16,046	18,115	16,932	86,740

3 The current actuals for the number of transfers and the number of relays are 50:50, therefore our forecasts for GD2 are constructed on this basis.

Special crossings

Our network includes 1,076 below 7 bar pipes that are constructed to overcome physical features such as rivers, bridges, and railway lines. We hold excellent condition data on these assets and all are in a risk-based inspection programme. These are often single points of failure so to deliver our stakeholder driven reliability targets we need to keep these assets in good health.

Investment in GD1 managed some issues with poor condition and improved the health of the population to an acceptable level. Our investment plan is lower cost in GD2 and aims to maintain the current level of health and risk and offset deterioration, rather than improve health further. This will be measured using our monetised risk approach, NARMs.

Our workload includes lower levels of replacement activity in GD2 than was included in GD1. This is to achieve the lowest whole life cost to manage these assets. Minor refurbishment would include patch painting or coating improvement, and minor work to brackets and supports. Major refurbishment would include a full paint or recoat, new brackets and supports, and work on wind and water lines. Replacement of crossings often involves installing a new crossing in situ, ie above ground and exposed to the environment. In the design stage, consideration is given to moving the crossing below ground using drilling techniques.

Special crossings interventions

		GD1 average	2022	2023	2024	2025	2026	Total
Special crossings (number of)	Minor refurbishment	32	26	27	27	26	28	134
	Major refurbishment	41	37	38	37	38	36	186
	Replace	12	6	12	4	6	6	34
	Survey	258	261	237	301	239	338	1,376

This can reduce the pipe's vulnerability to third party damage or deterioration from the elements. This is often cost prohibitive and the decision is made using CBA.

MOB record keeping

MOBs are blocks of flats or apartments of three storeys or above. The workload is directed at MOBs supplying multiple consumers that have a gas pipework that belongs to us, running within or attached to the building. This pipework is commonly known as risers and laterals. MOBs can be split into two groups:

- Those of six storeys and above (known as high rise).
- Those between three and five storeys (known as low rise).

During GD1, we undertook an inspection survey of every MOB, reviewing their condition and making sure that all risers were captured, they were safe and had isolation valves.

We hold a database of MOBs that includes asset details, condition data and consequence data. This data has enabled a risk assessment to be made on all assets. The GD1 and GD2 intervention plans are a result of these surveys and the subsequent review of health and risk. We have now moved to a risk-based inspection frequency for all MOBs. Our records are updated following the risk-based inspection to ensure that we hold the most up to date condition data and can keep our assessment of risk relevant.

We have rolled out the use of PE systems for riser replacement and have built £600k/yr cost efficiencies in GD2.

Click **Appendix 16C** for more information about our MOB record keeping.

We are awaiting the outcome of the Government Inquiry into the Grenfell fire and the HSE audit. However, we recognise that the public's acceptance of risk has changed and as a result we will intervene on 625 MOBs in GD2.

We are currently delivering a major project (SAP) to upgrade our systems and change our processes in readiness for GD2. The project, which completes in 2020, will deliver a system that records asset details and details of any customer interruption to a much better level of detail than is possible using our current system. MOB record keeping is a workstream of the project. It will deliver significant enhancements by bringing our MOB data into one place (it is currently held in two systems),

Chapter 16. The distribution network (continued)

MOB interventions

		GD1 average	2022	2023	2024	2025	2026	Total
MOBs – high rise (number of)	Replace	7	18	13	10	12	12	65
	Survey	42	21	28	24	31	26	130
MOBs – low rise (number of)	Replace	178	90	104	122	125	128	569
	Survey	485	371	371	371	371	371	1,855

and by providing improved data on unplanned interruptions.

Although we already run a risk-based inspection regime, the improvements to our systems outlined above will help us ensure that our understanding of these assets remains fully up to date. We also chair a national Asset Strategy group which provides an appropriate forum for us to share good practice and learning with other GDNs and wider stakeholders.

Given our GD1 investment in new systems we do not foresee additional costs for MOB record keeping in GD2.

The only potential exception to this relates to the independent Hackitt Review into building regulations and fire safety (May 2018); as a result of this review there may be a move towards building information modelling (BIM) to inform decision making. If this were required we estimate the impact in GD2 to be in the region of £2.6m.

This investment is not included within our business plan and would therefore need to be considered for an uncertainty mechanism.

Mains repairs

	GD1 average	2022	2023	2024	2025	2026	Total
Repairs (number of)	10,312	10,709	10,545	10,338	10,090	9,770	51,361

Service relays after escape

When a metallic service leaks, our policy, which is consistent with the HSE's requirements, is to replace the metallic service with PE.

Service relays

	GD1 average	2022	2023	2024	2025	2026	Total
Relay following escape/repairs	4,475	4,696	4,696	4,696	4,696	4,696	23,480

Mains repairs

Although our network is now 70% PE, this still leaves a considerable length of ageing metallic network, and many of these pipes are over 100 years old. We experience around 10,000 mains failures a year and we repair them as we find them. We will consider replacing the main, but this decision is based on many drivers, so single leaks are unlikely to result in replacement.

Our replacement programme in GD1 has broadly offset deterioration, so repair numbers have been relatively consistent, with year on year variations driven by winter severity. We expect repair numbers to start to decline in GD2 as the replacement programme overtakes the rate of deterioration. Our forecasts reflect this.

8. Value for money

This section explains how we ensure that we provide value for money for customers in delivering this programme. It outlines the reasons for our outperformance in GD1 and, looking ahead, the reasons why we will experience a more challenging cost environment in GD2.

High-quality data

The justification and drivers for this programme are underpinned by high-quality data and industry leading predictive and prescriptive analytics. This ensures that we can forecast the future performance of our assets with accuracy, and evaluate the cost and benefits of our intervention plans.

We have undertaken a number of activities in GD1 to ensure that our investment plans are based on high-quality data:

- We have developed asset repositories, structured to enable data analysis and encompassing in-built system validation to ensure data quality.

14,000

surveys of MOBs providing high quality data to help us manage risk.

We have introduced management information to inform our data quality.

- We have run a number of data cleansing projects, improving more than 200,000 records.

Annually, have carried out walking surveys of around 5,400 buried pipes each year, and in GD1 to date, 24,090 surveys of MOBs, and 6,620 surveys of special crossings. These surveys inform our forecasts of the likelihood of gas escapes in buildings, and the risk of explosions. Our approach to data management is risk-based, meaning we determine the importance of each data item, its influence on business decisions, and the sensitivity of that data item to errors. This informs our overall assessment of the appropriate level of scrutiny to apply to that item of data.

We undertake regular health assessments of the network, using a combination of condition surveys and fault and failure histories.

Chapter 16. The distribution network (continued)

Volumes – Total for population in PoF/Health Indicator band

		Health (km or Nr)										
Asset category	**Units**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**
Iron mains	km	0	0	1,642	79	62	0	1,139	31	0	1,988	**4,940**
PE mains	km	24,352	0	0	0	0	0	0	0	0	0	**24,352**
Steel mains	km	0	0	0	0	0	0	0	0	0	3,346	**3,346**
Other mains	km	0	0	0	0	0	0	0	0	0	0	**0**
Services	Number of	2,174,760	316,047	0	0	0	1,0127	0	0	0	0	**2,500,934**
Risers	Number of	2,579	3,780	4,088	1,850	547	281	236	42	43	614	**14,060**

Health of the distribution network

We undertake regular health assessments of the network, using a combination of condition surveys and fault and failure histories.

The following text summarises the health of each asset group at the start of GD2. HI1 are assets that are new, HI2 are good as new, etc, running through to HI10 assets which require intervention. This highlights that the PE network shows little sign of deterioration or failure, which is reflected in positive health scores. By contrast, iron mains and steel services are towards the end of their lives and our investment plan reflects this.

Prescriptive and predictive analysis

- Our investment in a powerful optimisation tool, Asset Investment Manager (AIM), links asset performance to outputs and puts a monetary value on those outputs. This provides invaluable analysis of the costs and benefits of investment options, and allows us to test a range of investment scenarios against delivery of stakeholder priorities. In this way, we ensure that our investment decisions are the most effective and efficient.
- Our assets are recorded on our Geographic Information System (GIS) and we use this information to assess the people, properties and infrastructure that are located in the vicinity of each asset. This information informs our assessment of the risk of death, injury, and damage in the event of an asset failure. This 'spatial query' process is also used to extract key cost drivers and to forecast the costs of intervention in relation to planned work.
- All mains and special crossings are digitised in a Graphical Network Analysis (GNA) tool. This forecasts flow and pressure around our network and predicts the loss of supply that would occur if any assets were to fail. The tool allows us to design mains replacement schemes and to make the best use of cost-effective insertion techniques.
- All iron mains are assessed using our predictive tool called the Mains Replacement Prioritisation System (MRPS). The tool takes failure and survey data and is able to forecast the likelihood of future failure, gas entering a building, and gas igniting and causing an explosion.

Taken as a whole, these analytical tools mean that we are now able to predict, at an individual pipe level:

- The likelihood of future failure and the way the pipe is likely to fail.
- The consequences of such failures and associated costs.
- The cost of intervening on the asset.
- The cost and benefit case for the intervention plan.

As an example, for every cast iron pipe, we predict the number of fractures, joint failures and corrosions it will experience, and the cost of responding to those failures. We know how likely it is that the leak will result in gas tracking into a building and how likely it will be to reach ignition levels. We also know the level of methane leaking from the pipe to the atmosphere and the likelihood that its failure will cause customer interruptions. If we decide to replace, we know the cost. This is informed by detailed forecasts at a pipe level of replacement size and technique, the number of services connected and the number of excavations required to complete the job.

Cost benefit analysis

Our predictive analytics give us the full corporate and societal costs of operating each asset, and the cost impact when we intervene on the asset.

This enables a highly comprehensive CBA that underpins the investment plan. We apply the principles of the Treasury Green Book and of the Spackman approach to the analysis. Our CBAs are provided as **Appendix 15A**, supported by accompanying engineering justification documents. The results are an investment plan that is NPV positive to £938m and pays back in the early 2030s. This is well within the forecast operating life of these assets under any future energy scenario.

We have undertaken CBA of mains replacement programmes of varying lengths, compared with a baseline of doing nothing. Ageing metallic mains have direct operating costs (as well as significant carbon impacts through leakage) so generally cost more to maintain than replace. We know that mains pay back over 15/20 years and, if we stopped our programme now, we would have to pay for repairs, which would be more expensive than not having a mains replacement programme.

Click **Appendix 15A** for a catalogue of our CBAs and engineering justification documents.

CBA results

	NPV (£m)			
Asset	**2030**	**2035**	**2040**	**2050**
Tier 1 + <=2" Steel	-£102	-£47	£114	£707
Tier 2/3	-£7	£2	£24	£102
Steel	£0	£12	£33	£107
MOBs	£1	£5	£10	£21

Chapter 16. The distribution network (continued)

9. Options

Replacing older pipes to remove risk and reduce carbon emissions.

To support our stakeholder wants and needs we developed a number of options using our optimisation tool AIM. We were able to derive stakeholder outcomes and outputs for various workloads and investment scenarios. As an example, we can link an investment programme to the impact on customer interruptions and the likelihood of an explosion, and injuries and fatalities as a result.

We can then analyse alternative investment programmes and understand the impact of each on interruptions and safety.

Risk removed

We developed a number of workload scenarios, with associated outputs and cost benefit analysis (CBA) of each. The results are shown below. This analysis informed our workload levels.

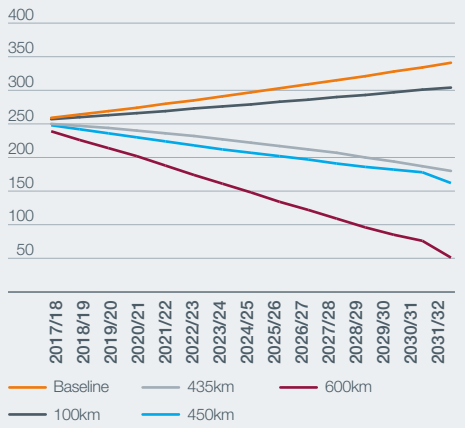
The figure illustrates the safety benefits of the mains replacement programmes of varying lengths, compared with the baseline of 'doing nothing'.

To support our stakeholder wants and needs we developed a number of options using our optimisation tool AIM.

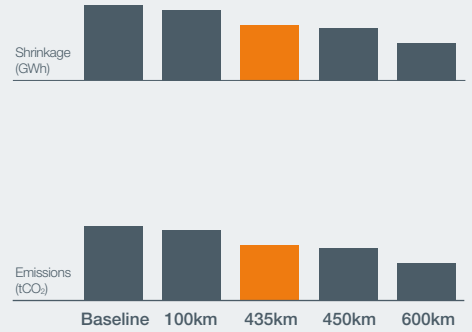
Environmental outcomes

The figure below illustrates the environmental benefits of the mains replacement programmes of varying lengths, compared with the baseline of 'doing nothing'.

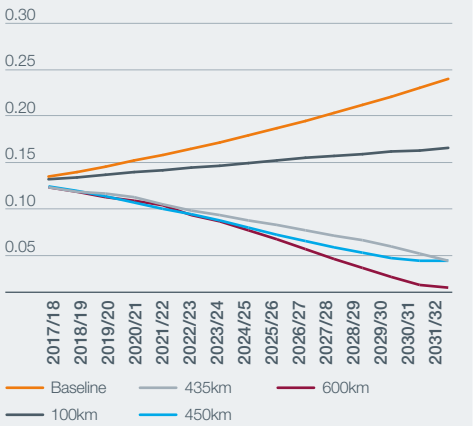
Shrinkage and emissions (GWh)



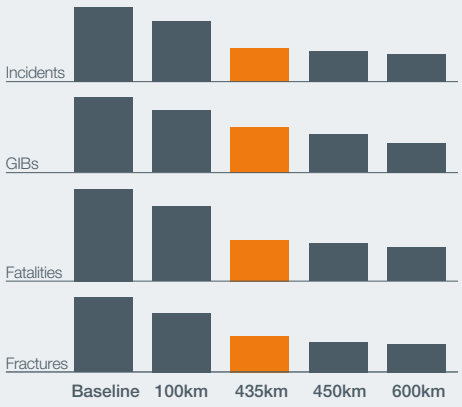
Total over 15 years (2017-2032)



Risk remaining (incidents pa)



Total over 15 years (2017-2032)

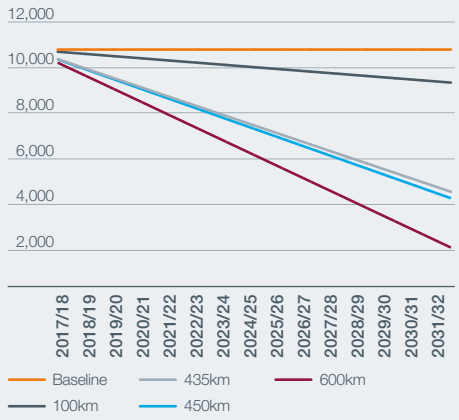


Chapter 16. The distribution network (continued)

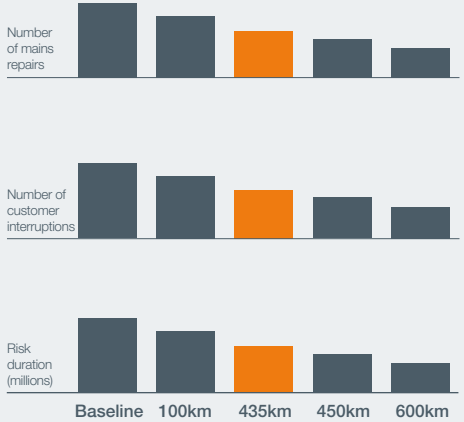
Other benefits

The figure below illustrates the impact on repair numbers and on interruptions to customers of the mains replacement programmes of varying lengths, compared with the baseline of 'doing nothing'.

Km of metallic mains remaining



Total over 15 years (2017-2032)



Stakeholder influence on the programme

Our stakeholders have told us mains replacement is their second highest priority (Impact Utility engagement programme, 2019), with safety and attending gas emergencies within one hour as the first. Customers and businesses are also prepared to pay more for an enhanced service of reduced leakages, for both safety and environmental reasons. Repex is also supported by CBA and the larger the programme, the more NPV positive it is.

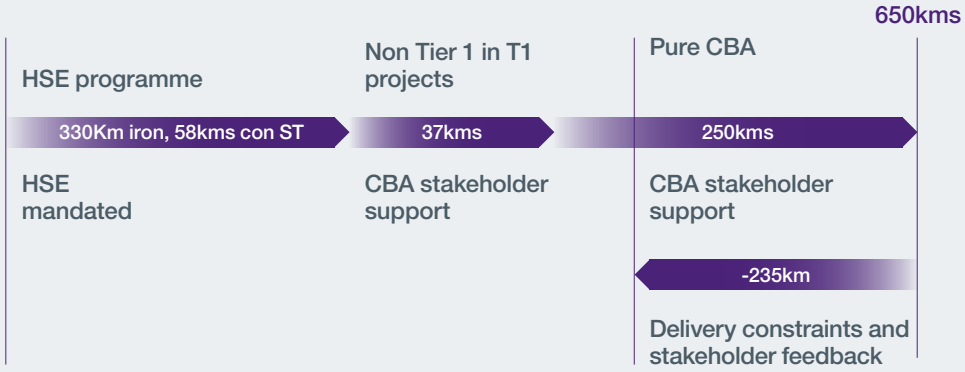
We intend to replace on average 435km of metallic main each year. The HSE mandated programme combined with CBA positive pipes could take us to a much higher level of mains replacement.

However, we have had to cap the length of the programme for two main reasons:

- Our stakeholders, particularly local authorities, tell us that current workload levels in their regions are about right in terms of benefit and impact on their communities, and they do not wish to see an increase.
- Feedback from our engagement with the market is that delivering an increase in the programme beyond current lengths would be extremely difficult given the challenges in securing labour for this activity.

It should be noted that we are unable to reduce the size of the programme beyond what is HSE mandated as they would not accept this.

Mains replacement – annual length options



10. Costs

Becoming more efficient and maximising innovation techniques.

The main reason for our outperformance in GD1 has been our focus on innovation and the favourable alliance contract that we secured. The following factors enabled us to achieve a low contract price and beneficial contract terms[4]:

A long price control period: In 2013, we entered into an eight-year alliance contract, made possible by the eight-year GD1 price control period. This provided our alliance partners certainty about workloads over a longer period and meant we could negotiate a lower contract cost.

More flexible pipe selection criteria: Greater flexibility, which was negotiated with HSE, provided a short-term opportunity to design schemes that were significantly larger than had previously been possible. This was reflected in the rates we were charged, and allowed us to benefit from the following:

- **Using larger teams in smaller geographical areas**: The success of the five/six-person team model during the first half of GD1 improved operational efficiency and produced a level of performance beyond our forecasts.
- **More efficient support functions**: Larger teams delivering larger quantities of work in a small geographical area can be serviced more easily by support functions. For instance, logistics support functions have fewer projects to service and there is less

4 Further information about our GD1 performance is set out in our paper 'Mains Replacement Performance RIIO-GD1', which was submitted to Ofgem in June 2019.

Chapter 16. The distribution network (continued)

travel time between sites. Reinstatement teams can also have a higher number of excavation pits in one geographical location.

- Lower mobilisation/demobilisation costs: larger and fewer schemes reduce the significant cost of safe mobilisation and demobilisation of sites. In the remainder of GD1, scheme sizes will fall, as will team sizes, whilst the number of schemes will increase – with a resulting impact on our cost base.
- Lower management to team ratio: operational and safety management are most efficient when team sizes are maximised and the number of schemes that are in progress are kept to a minimum. The change in the design constraint allowed us to achieve this balance. Now these schemes have been depleted, we are seeing a fall in the size of our teams with a related increase in scheme numbers – moving back to a similar profile as in GDPCR1.

A favourable labour market: The programme benefited from a reliable and consistent workforce in the early years of the current contract (before contract negotiations), and the labour rates in our fixed contractual pricing reflected this. In the past few years, however, this landscape has changed significantly, and labour rates are continuing to increase. This is being driven predominantly by competition with other GDNs and other capital programmes (including in the water, electricity, nuclear, telecoms and transport sectors. As a result of securing a favourable alliance contract, our business and our customers continue to be protected from adverse market conditions and to benefit directly from our commercial arrangements.

However, this will not be sustainable once the contract expires at the end of GD1, as the contributing factors above will not continue in the remainder of GD1 and into GD2.

Other key factors in our GD1 outperformance to date include:

Reinstatement: In 2015, we implemented an incentive scheme with our contractors that aimed to reduce our service and mains excavation sizes, thereby reducing the costs associated with backfilling and reinstating the holes. Since implementing the initiative, we have seen an overall reduction of 18% in the average size of our network's holes.

500m coil trailers: Our self-funded innovation project to develop 500m coil trailers has significantly supported insertion and has reduced the number of insertion pits, pipe wastage and our environmental impact. These are now used by all of the GDNs, driving improved performance for all gas customers.

Purchase versus hire of plant and equipment: We regularly review plant and equipment to consider whether hiring or purchasing is the most effective option. To avoid paying a premium through plant supplier rates, we have purchased welfare units, vans and plants.

Ductile Iron (DI) cutters: In the first few years of GD1 we focused on cast iron/spun iron. The reason we did this was because cast iron/spun iron carries relatively more risk than ductile iron. We were aware that we would need to start focusing more closely on ductile iron in GD2 and in GD3 as we came to the end of the programme to deal with the higher risk cast iron/spun iron. This will lead to cost increases for each metre replaced because of the difficulties of working with ductile iron (specifically the difficulty of cutting into the pipe to connect services). We therefore decided to lead on an NIA project to develop a tool that would make this activity easier and more cost-effective.The tool that was developed – a ductile iron cutter – is now operational and will help to counteract (although not fully mitigate) the higher costs of replacing the ductile iron as we start working on the higher levels that remain to be replaced in our programme.

Mobile app: During 2014/15 we successfully implemented a mobile app-based system for our contract partners to use when recording work on mains and service replacement. This system brings with it opportunities for significantly improved data capture analysis and sophisticated management information at a team level. These insights enable us to further improve our performance and reduce the duration and volume of customer interruptions.

Special crossing techniques: To achieve the lowest whole life cost we have developed innovative solutions such as using life extending refurbishment options where appropriate and cost efficient. In the first six years of GD1, we refurbished 158 of our special crossings, with a further 33 replaced and 17 abandoned.

Chapter 16. The distribution network (continued)

11. Challenges on the future cost of delivery

Many of our innovations in GD1, such as the DI cutter, 500m pipe coils and predictive analytics, deliver enduring efficiencies in GD2. These are included in the base costs for GD2. There are, however, upward cost pressures that are described in the waterfall chart below.

Movement in these four key cost drivers are explained in the sections below.

Mains laying technique

To minimise disruption to customers and maximise production, we try to maximise use of mains insertion techniques and avoid open cutting mains. Open cut involves digging and backfilling a trench the full length of the main to be replaced, laying the new main in the trench and transferring all services.

Insertion involves digging pits at either end of the main to be replaced, then inserting the new main inside the old main. Pits are then dug at each service connection and the services are transferred to the new main. Insertion is the preferred technique as it:

- minimises disruption to the public as there is less time involved in the replacement and less excavation in the highway or pavement;
- lowers costs due to less excavation, reinstatement and time on the operation;
- leaves the new main in a protective sleeve (the old metallic main).

We size replacement pipes using network analysis models that have all pipes in our network and gas demands for every consumer.

These models allow us to simulate replacement pipe sizes and the impact on capacity and pressure. We size replacement pipes using network analysis models that have all pipes in our network and gas demands for every consumer. These models allow us to simulate replacement pipe sizes and the impact on capacity and pressure. We update the models with views on future demand in the 1, 5 and 10 year planning horizons. We are obliged as part of our licence conditions to design our network to keep continuity of supply in a 1:20 winter. This is the worst winter we are likely to see over a 20-year period based on historical experience of winters. When we design a replacement scheme we can assess the replacement diameter's impact on the ability to meet gas demand in these 1:20 conditions. The table above shows our forecast of peak demand; our forecasts are updated on a regular basis and we would always use the latest version when designing schemes.

Peak demand forecasts **– long-term development statement.** It can be seen that peak demand continues to rise even where annual demand is falling due to overall energy efficiency. Our replacement programme is designed to support this.

To produce the GD2 plan we have invested a significant amount of time and skill in analysing the pipes and projects we will deliver.

The process followed has involved grouping all mandatory iron replacement pipes into efficient projects. This includes all pipes that require replacing by 2032, the end of the HSE iron mains replacement programme. These schemes were then put through the network analysis process to determine which pipes could be inserted and which would need to be laid in an equivalent or larger diameter.

The results were that 80% of pipes could be inserted across the rest of the programme to 2032, with the remainder requiring open cut. This compares with an insertion rate of 90% achieved in GD1. This change to open cut technique impacts cost £3.8m per year. Our GD2 programme is designed to flat phase delivery costs through to 2032.

Our self-funded innovation project to develop 500m coil trailers has significantly supported insertion and has reduced insertion pits, pipe wastage and our environmental impact.

Click **Appendix 16A** for details on workloads and costs analysis.

Click **Appendix 16B** for details on workloads and costs analysis.

Peak demand forecast (GWh)

LDZ	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29
South West	25.4	256	263	271	276	278	281	284	287	209
Wales North	4.9	49	51	52	53	53	54	55	55	56
Wales South	194	194	198	201	201	201	201	203	205	207
Network total	**497**	**499**	**512**	**524**	**530**	**533**	**537**	**542**	**547**	**563**

Waterfall GD1 average cost to GD2 average cost (£m)

Chapter 16. The distribution network (continued)

The table below shows the GD2 forecast insertion rates by mains type.

GD2 forecast insertion rates

Insertion/open cut rates for GD2 km	Insertion	Open cut	Total	% insertion
Consequential Steel	106	138	244	43%
Other Steel	108	2	110	98%
Over 30m	34	16	50	68%
Tier 1	1414	205	1620	87%
Tier 2a	40	55	95	42%
Tier 2b	32	18	50	63%
Tier 3	3	8	11	23%
Total	**1736**	**443**	**2180**	**80%**

The cost of open cut is significantly different from insertion, there are changes to how you plan and deliver along with the costs of the work itself. Open cut work decreases productivity because it requires us to do the following across the entire length of the replacement works:

- carefully excavate a trench to avoid damaging other utility apparatus;
- maintain access to driveways and businesses;
- maintain traffic control and flow.

These productivity issues increase the labour time on projects and impact the customer experience. The costs of carrying out the work itself is impacted by the following:

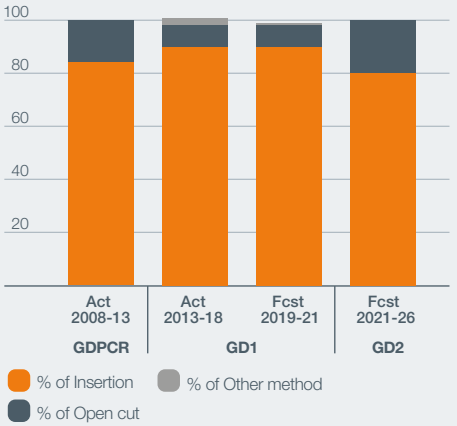
- additional excavated and backfilled material;
- additional travel times to quarry can be impacted depending on regions;
- additional reinstatement of surfaces and street furniture;
- additional logistical support for the work delivery;
- additional machinery and plant usage, movement and size;
- additional disruption to customers, pedestrians and road users.

Example project – prime costs

Tier 1 >75mm to 125mm – example project – prime costs	Insertion	Open cut
Labour & plant	43.10	90.40
Reinstatement	5.90	42.20
Logistics	4.50	32.20
Backfill & spoil disposal	3.00	21.50
Pipe & fittings	16.00	23.30
NRSWA	0.80	6.10
Cost per metre £s	**73.30**	**215.70**

The chart below shows changes in insertion to open cut ratios from GDPCR to GD2.

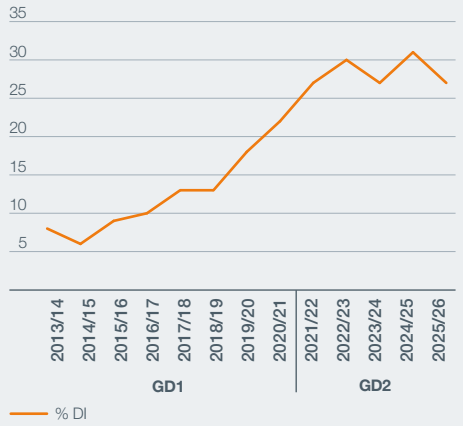
Mains replacement technique (%)



Existing mains material changes

As outlined in the chart below, at the start of GD1's eight-year programme we avoided DI to reduce the whole life cost of the programme, while a more cost-effective DI cutter was developed. DI remains more difficult to cut than cast iron or spun iron, so an increased cost for labour delivery should be expected year on year as the ratio of ductile to cast iron/spun iron increases. To date less than 10% of our mains replacement workload has been DI.

% Workload ductile iron



Our DI tool has already had a considerable impact on helping to offset the cost of the DI work we have undertaken in GD1. The use of this tool will continue to help offset the additional costs associated with the increasing amount of DI work that will be required in GD2. We have shared our DI tool with the wider industry to make sure that the benefit can be realised by other GDNs and their customers.

We estimate a cost avoidance of over £0.5m in GD2 if trials of our live innovation project 'cryogenic cracking' are successful.

Chapter 16. The distribution network (continued)

150

new employees recruited, as part of our efforts to bring higher skills and training, and increase delivery capacity.

Labour cost pressures

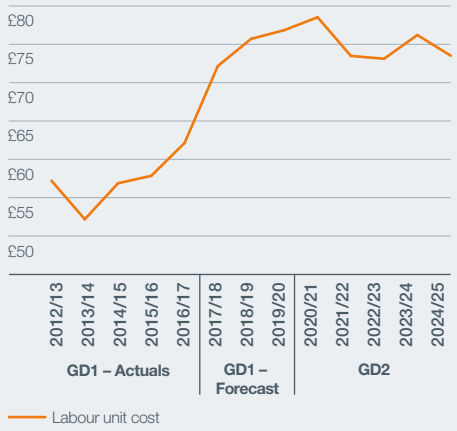
Labour costs make up approximately 37% of our annual mains replacement programme costs. A current excess of demand over supply of skilled labour is driving up labour salary demands, particularly as other GDNs are offering extremely high levels of remuneration as they seek to recover their mains replacement shortfall.

There are major programmes in water, electricity, nuclear, telecoms and transport industries – all with significant capital projects. These projects include:

- Hinkley Point C.
- High Speed 2.
- Thames Tideway.
- The expansion of Heathrow airport.
- Various projects being run by Network Rail and Highways England.
- Projects as part of city regeneration programmes.

Many of these projects fall within or close to our network, making us more susceptible to subcontractors and staff leaving us to work on these projects.

Labour unit cost (per metre)



While we offset some of this risk through the early delivery of our programme, we are seeing our cost base increase significantly to keep our programme on track. During 2017/18 and into 2018/19, the transient nature of our workforce has disrupted our programme and has resulted in a reduction in the overall amount of work that we delivered, compared with our internal programme plan.

We are mitigating this risk through the continued implementation of our Resource Strategy to recruit graduates and apprentices and by more general upskilling of the current workforce for supervisor and technician roles. We have worked hard to apply an innovative approach to the management of our workforce to ensure delivery of our mains replacement programme, while planning for succession into the future.

This includes recruiting 150 new employees across the network to sustain and increase our delivery capacity, including more than 40 new employees in the Cornwall area, to deliver our large programme of work in that county.

However, moving into GD2 there are likely to be shortages in transferable skills such as ground-workers, truck drivers, and traffic light controllers. These are all areas in which we are experiencing highest churn levels and increasing cost pressures.

This price control has seen a large number of skilled engineers moving to other GDNs, attracted by the inflated rates on offer; our alliance partner has been forced into providing teams with payments over and above contracted rates to carry out the work as the period has progressed. This will not be sustainable in GD2 contract negotiations and is therefore reflected in our GD2 investment plan.

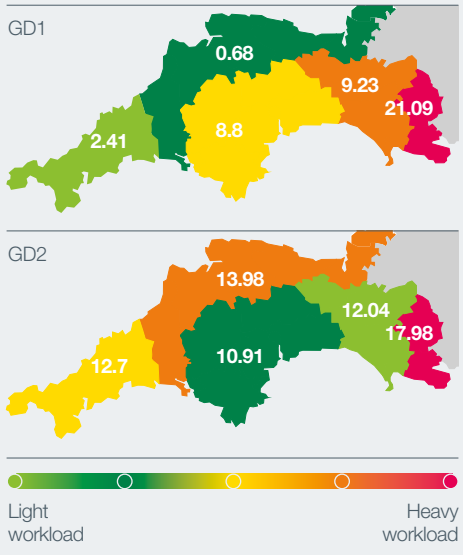
Click **Chapter 19: Workforce resilience** for more information. 181

Regional workload movements

Regional movements in workload are resulting in cost increases due to the impact of local quarry fees and travel time to jobs increasing.

For example, the average annual workload in Cornwall in GD1, compared with the average annual workload in Cornwall in GD2 is shown in the following figure.

Average annual workload in Cornwall in GD1/GD2



Quarry costs

The table below highlights the tipping costs per tonne by area, highlighting why movement of work to the extremities of our network has a cost impact.

Tipping rates

Operational areas	Cost/tonnes
East Wales	8.2
West Wales	7.2
North Wales	9.6
Wilts Glos	15.8
Bristol Bath	10.1
Devon	34.4
Exeter Somerset	14.9
Cornwall	34.4

Chapter 16. The distribution network (continued)

12. Innovation

Using innovative techniques will assist us to become more efficient and reduce costs for the consumer. This saving is built into our GD2 costs.

We use innovation to improve efficiency, reduce disruption and lower the cost of our mains replacement and network riser maintenance. Our approach to innovation is very much focused on solving real challenges. This includes, for example:

- We have developed a suite of cutting tools for ductile iron and steel to enable more live mains insertion and to minimise excavation sizes.
- We have made significant carbon savings by trialling and implementing a thinner walled PE pipe.
- We have reduced the time taken on site by rolling out new fittings that improve the efficacy and quality of workmanship.
- Our predictive analytics and design process has enabled us to achieve an insertion rate of 89%.
- Finally, we have developed swifter, safer, and less disruptive ways of flow-stopping that reduce excavation sizes.

We will continue to look closely at innovation across GDNs in robotics, no-dig technologies and lines. We plan to test and take these to commercial use in our business through GD2 as they develop.

There are innovations that we have discounted from adopting in our business following detailed assessment of cost and benefit. An example of this is the 'Large Cisbot', an NIA project led by SGN (see case study in Chapter 11: Our Innovation Strategy). Our approach to innovation is very much focused on solving real challenges.

Following engagement with internal and external stakeholders, our focus areas for GD2 will be:

- exploiting trenchless technologies;
- internal inspection of pipes for condition, stresses and strains;
- internal repair of pipes using latest robotic technologies;
- new solutions for managing pipes feeding high rise buildings.

Our BAU project 'MLS Bagging Off' is forecast to deliver £80k/yr saving in GD2 and help our engineers dig smaller holes, use less fittings and not need to use cranes on site.

We use innovation to improve efficiency, reduce disruption and lower the cost of our mains replacement and network riser maintenance.

Embracing innovation

The ServiceCam allows us to discreetly survey small service pipes, avoiding unnecessary disruption to our customers.

Conclusion

This chapter has outlined our plans to continue replacing our distribution network with environmentally friendly plastic pipes, improving levels of safety for our customers, reducing the risk of explosions and lessening our impact on the environment.

Importantly the pipes reduce the need for costly unexpected repairs and therefore represent real value for money for our customers. Our planned activities have been shaped by our customers and other stakeholders.

We are proud of our track record to date in managing the distribution network, and look forward to building on this in GD2.

Chapter 17. Connecting homes and businesses

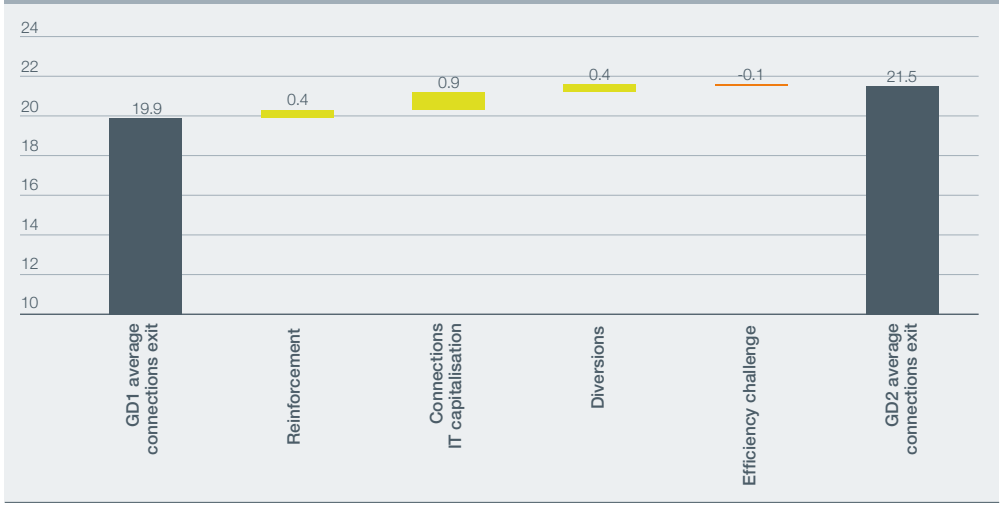
1. Highlights of our plan

- Gas provides a reliable source of energy at an affordable cost for customers, and continues to be their preferred fuel of choice. This is borne out by current market trends, with 80% of new build properties taking gas as the primary source of heat. Our current assumption is that this trend will continue through GD2.
- The Government's announcement on the Future Homes Standard 2025 proposes to require all new homes to be built without fossil fuel heating from 2025. We will contribute to a consultation but our analysis shows a minimal impact on workload.
- As gas is 75% cheaper per kWh than electricity, we can help address fuel poverty by promoting fuel poor connections, which save customers who switch up to £700 a year. In collaboration with our partners, who are trusted by consumers and can access funding for internal measures, we will deliver 2,500 fuel poor connections in GD2.
- Our plan supports connections to around 10,000 domestic and commercial consumers a year, as well as being a primary or secondary fuel source for the majority of heat networks. This, combined with our engagement with the independent gas transporters (IGTs), means we are enabling our network to be available to 30,000 new households each year.
- Our plan supports an integrated energy network of the future by enabling developments in local power generation, connections to green gas production sites, and for transport including Compressed Methane Gas (CMG) vehicles.

At a glance: investing in exit connections

	GD1 workload (average pa)	GD2 workload (average pa)	GD1 costs (£m pa)	GD2 costs (£m pa)
New mains	51km	45km	2.9	2.6
New services	11,310	9,960	9.1	9.3
Reinforcement mains	16.4km	18.4km	4.1	4.5
<7bar diversions	7km	9km	1.4	1.6
LTS diversions	4km	3km	1.7	2.8
Service alters and disconnections work	5,470	6,000	0.7	0.7
Total cost			**19.9**	**21.5**

Connections exit GD1 average v GD2 average 2018/19 prices



2. Introduction

Our objective is to protect the interests of current and future consumers, whatever the future may bring. This includes continuing to support the provision of the cost-effective and reliable energy sources that are vital for the economy.

As outlined in Chapter 13, the UK is experiencing a step change in the interaction between the gas and electricity networks, and we are confident that under the single scenario, the gas network will continue to play a key role through to 2050 and beyond.

Connections are made to the network to enable:

- customers and businesses to take gas from our network (known as exit connections);
- third parties to put 'green gas' produced from renewable sources (such as biomethane) into the network (known as entry connections). This is covered in more detail in Chapter 13: Our net zero ready vision for 2035.

Our connections workload is driven by the economy and in turn by customers. We pride ourselves on the level of service we provide to our customers – from their original contact with us through to the delivery of new gas connections.

Chapter 17. Connecting homes and businesses (continued)

The connections-specific Guaranteed Standards of Performance (GSoPs) provide a minimum level of service that we always look to exceed for every customer while providing value for money. Our commitments to customers are set out in detail in Chapter 6: Customer service.

In this chapter we explain the investment we will make to:

- continue to meet the customer-driven needs of new and existing housing and commercial developments by connecting them to the gas network;
- modify our infrastructure to facilitate development – whether that is through a service disconnection, alteration, mains diversion or network reinforcement.

3. Customer and stakeholder feedback

Working in partnership with others will enable us to better understand customers' future energy needs.

General feedback

The investments set out in this chapter have been informed by our analysis of the economic and social aspirations of our wide-ranging consumers, including local communities, and local and national government. To support our understanding of the future requirement for new homes, we undertake extensive, ongoing analysis of the development plans for around 33 unitary authorities and engage with local and national housing developers.

We carry out regular engagement through face to face meetings with customers and through focus events. In GD1 this included:

- Two customer focus groups (June 2017).
- A connections customer focus group (May 2018).
- A power generator workshop with developers and GDNs (June 2018).
- A power generation workshop with Western Power Distribution (WPD) and National Grid (March 2019).
- Multiple engagement as detailed in Chapter 13: Our net zero ready vision for 2035.
- Engagement with the Welsh Government on energy efficiency, fuel poverty and decarbonisation.
- Joint GDN engagement with BEIS on fuel poverty and the future of the Energy Company Obligation (ECO) scheme.
- Engagement with our largest commercial gas consumers.
- Local authority engagement and review of local development plans.

Tackling fuel poverty

At our regional workshops in 2018 our stakeholders and consumers ranked tackling fuel poverty as our third most important priority. The issue also scored highly in the 2019 stakeholder reports by Impact Utilities and Mindset. In general terms, consumers support a small premium on gas bills to ensure that those who need additional support are identified and helped. At the September 2018 Critical Friends Panel, 50% of stakeholders supported increased investment in this area. Consumers are also supportive of our working closely with specialist partners.

Other stakeholders, such as National Energy Action, have demonstrated strong support for the continuation of the Fuel Poor Network Extension Scheme (FPNES), and support networks having access to funding for internal measures[1]. We are therefore committed to the fuel poor scheme funding first time gas connections in GD2, with a focus on those most in need, and will work with partners to achieve this.

Further information about our work to tackle fuel poverty beyond the FPNES is set out in **Chapter 7: Social obligations.** 62

Future requirements for new connections

The conclusion from our stakeholder engagement is that developers and home owners will continue to see gas as the first-choice fuel to heat a home where the property/developments are close to our network.

It is expected that BEIS will decide on the UK future of heat strategy by 2021 and the expectation is that this will be a future of renewables, hybrid heating systems and heat networks – all supported by decarbonisation of the gas grid and future decarbonisation of electricity.

In the meantime a report by the Committee on Climate Change[2] in February 2019 has led to an announcement in the Government Spring Statement of a Future Homes Standard which proposes that gas would not be allowed in new homes from 2025. Our business plan forecasts assume a continuation of new gas connections to new build homes to the end of 2025.

To hit legally binding carbon reduction targets, the UK must also tackle emissions from industry and transport. Again, the gas network is playing its part through supporting localised gas fired power generation which supports intermittent renewable generation, enabling the development of heat networks and CMG filling stations for HGVs and buses. We already have three connections to CMG filling stations to support city bus fleets.

New housing

As outlined previously, as part of our planning we have examined around 33 unitary authority development plans and have reviewed existing planning applications using the Glenigan site (a website that provides national and regional information about forthcoming construction projects). We have also participated in workshops with local authorities as they develop their plans (including Plymouth and West Devon, Flintshire, Wiltshire, and Bath & North-East Somerset).

1 NEA response to the Commission for Customers in Vulnerable Circumstances' call for evidence (May 2018).

2 'UK Housing: Fit for the future?', 21 February 2019, Committee on Climate Change.

Chapter 17. Connecting homes and businesses (continued)

We also used the data that is published by BEIS to forecast housing growth in each local authority area. This analysis indicated that 123,000 houses are likely to be built in our region in 2021-26.

New housing growth in GD2 in our network

	2021/22	2022/23	2023/24	2024/25	2025/26	Total
England	17,901	17,458	17,396	17,730	17,356	87,841
Wales	7,030	7,496	7,118	6,885	6,486	35,015
Total	**24,931**	**24,954**	**24,514**	**24,615**	**23,845**	**122,858**

A review of the number of houses built in our area, and the total number of new gas connections made over the last five years, demonstrated that 80% of homes have a gas connection. Our engagement with developers to date indicated that this position is unlikely to change.

Analysis over the past six years shows that we have 19% of the new housing market, with the IGTs undertaking the other 81%. We forecast that this will remain largely unchanged over the period up to 2025, which leads us to a forecast workload of 21,000 connections to new homes during GD2. Heat pumps and district heat networks are likely to fill the gap in heating many of these homes and we discuss district heat connections under non-domestic connections overleaf.

Having assessed the potential impact of a Future Homes Standard on new housing in GD2 we are not forecasting any material change to our workloads in this area.

Click **Appendix 17A** for English and Welsh housing projections.

Click **Appendix 17B** for a sensitivity analysis on the impact of the future homes standard.

Existing housing connections

Our analysis of workload trends in connections to existing housing over a ten-year period (from 2008 to 2019) indicated that there is a clear downward trend in the number of connections. This has levelled out over the past 12 months because of changes to the FPNES which result in social housing properties not being funded, but with social landlords choosing to fund gas connections themselves (as gas still offers the best cost option for their homes).

Spatial analysis of our GIS mapping systems shows that there are around 90,000 homes within 23 metres of our network that do not have a gas connection, although many of these homes will be modern flats or new builds where renewables are installed as part of the build. The 90,000 figure is reducing year on year as a result of the 5,000 plus homes that we connect each year (including fuel poor connections).

There is still wide support from social landlords, and from off gas communities and the councillors who represent them to extend the gas network. Current funding rules limit what is economic and we have seen no evidence that the UK Government intends to facilitate a change.

We have undertaken many infill schemes to off gas communities during GD1, including mains networks of up to 7km serving 200-300 homes. The service numbers are not significant but the projects do drive annual peaks in main-laying. These projects have been driven by local authorities, large social landlords and the Welsh Government (under the Arbed Community Energy funding).

Funding is unclear in GD2 but we have assumed that we will facilitate one such large scheme each year in GD2, with typically 4km of mains and 200 new service connections.

We have concluded that we will connect 23,000 existing homes during GD2 (excluding the fuel poor scheme).

Fuel poor connections

In September 2018 Ofgem engaged management consultancy Sia Partners to carry out a review of the effectiveness of the FPNES. We contributed to the review, which supported the continuation of the FPNES[3] scheme. The continuation is also supported by National Energy Action (NEA) and the Welsh Government where it offers the best option for the home.

Stakeholders support a more targeted focus of the FPNES towards vulnerable homes that can be demonstrated to be in fuel poverty. The modelling that Sia Partners carried out showed that to be of value to society the scheme does need to connect at least 50% of homes that meet the fuel poverty definition. We believe the current eligibility FPNES criteria meet this requirement.

3 Project report: Options for the Fuel Poor Network Extension Scheme in RIIO-GD2, SIA Partners, 2018.

As a group of GDNs, we have worked closely with BEIS during GD1 in developing the DECC Central Heating Fund (£25m for new gas boilers). We reported to the Off-gas Grid group which in turn reported to the Fuel Poverty and Energy Efficiency Parliamentary Group. The GDNs are all concerned about the lack of visibility of funding for first time central heating systems after 2021.

The Welsh Government has options on its Nest and Arbed schemes to extend to 2022. We will be participating in a review of the Welsh Government's fuel poor strategy during 2019. We have also kept close to developments in relation to the Energy Company Obligation (ECO) scheme through to the current phase ECO3. BEIS is yet to decide whether the successor to ECO3 will support gas boilers or be more focused on renewables.

Given the uncertainty concerning the ability to link our FPNES funding to funding for the heating system, all of the GDNs are concerned about committing to numbers at this stage, and instead favour a mechanism to match our workload to funding or any national infrastructure scheme on energy efficiency and decarbonisation.

We are forecasting 2,500 fuel poor connections during GD2. We have phased our workload reflecting work from the Welsh Government and ECO3 in the first two years and dropping away towards the end of the period.

Chapter 17. Connecting homes and businesses (continued)

Non-domestic connections

The majority of the 600 non-domestic connections we make each year are small businesses such as shops, cafés, offices, and leisure outlets.

Fewer than 5% are large loads or higher-pressure connections, which include process loads, larger space heating loads, gas fired power stations, CMG fuelling sites, Combined Heat and Power (CHP), and supplies to district heating energy centres.

Click **Appendix 13I** for further information on enabling renewable generation.

Click **Appendix 13K** for further information on facilitating green transport.

Click **Appendix 13L** for further information on heat networks and CHP.

600

non-domestic connections made each year to small businesses such as shops, cafés, offices, and leisure outlets.

Electrical power generation

Small electrical power generation plants play an important role in offering balancing services to the power networks, effectively using storage in our network to provide flexible generation to the electricity network. We continue to receive enquiries for such plants and have connected 31 sites in GD1 to date, providing an additional 526 MW electricity output from our network.

We understand that 50-100 sites would like to connect by 2026 as detailed. Progress towards electric vehicles and the electrification of trains and trams in our network area all place a demand on the electric network that can be supported by the flexibility of the gas network.

District heat networks

We have worked closely with E.ON on the development of district heat networks in Cranbrook near Exeter, and the Bath Riverside development. These two developments will supply almost 15,000 homes with gas as the primary fuel for most of the year, combined with some back-up from solar and wind in the summer months when demand is lower.

We have also worked with consultants on schemes for Bristol and Cardiff. Although these schemes will use waste heat from incinerators, gas will still be required to support the energy centres and ensure a reliable supply 365 days a year.

Under BEIS Heat Network Delivery Unit, 92% will be gas CHP or gas hybrid.

CMG transport

In the past two years we have connected supplies to CMG filling sites at bus depots in Bristol and Plymouth. We are now working with developers of public access filling sites in Avonmouth and Cardiff; we expect this market to grow, with connections taken mainly from the intermediate pressure and high pressure networks.

Reinforcement

Specific reinforcement is associated with specific larger loads, whereas general reinforcement is associated with multiple smaller loads connecting to our network or changes in gas usage across the network.

Many of the developments that are planned for GD2 are to green field sites at the edges of towns and cities. We are also anticipating growth in towns that are at the end of long distribution networks.

Based on our work with local authorities, consultants and developers, we are forecasting that our reinforcement workload will continue at the rate seen in the later stages of GD1. This reflects trends in the economic outlook during GD1, as well as forecasts in the economy for GD2. The proposed policy change to prevent new gas connections to new builds from 2025 would not remove the need for reinforcement. This is because any gas fired district heat networks are also likely to require reinforcement, as would gas fired electricity generation sites to support heat pumps.

Diversions

The distribution network diversions workload is relatively consistent year on year, with an average of 7km and a variance of 1km.

Most diversion schemes are associated with new housing, commercial developments and transport schemes. A smaller proportion is driven by environmental factors such as river bank erosion and land movement. These can create a peaky and unpredictable workload.

Through our stakeholder engagement we have identified a continuing need to move mains for development sites and major transport projects that support the local infrastructure and therefore the local economy and communities. These projects, an example being the South Wales metro, will require localised diversion schemes.

The South Wales metro is a new transport system for the Cardiff capital region. It will require us to divert distribution mains and provide a new supply to the site. We are ensuring that we have constructive relationships with the relevant parties in relation to this substantial project, in order to improve the timescales to connect customers and businesses where our work is in close proximity to the railway.

Through GD1 we have realised that there is risk around LTS pipelines as developers are applying legal pressures to move the pipes so they can maximise development land. This has led to a significant increase in workload and costs for LTS diversions in GD1.

Chapter 17. Connecting homes and businesses (continued)

One scheme in particular in the south west of England is set to cost many millions of pounds to resolve and entails our involvement in a court case that is the first of its kind. The case is being followed with great interest across the industry and we will share what learning we can to support other networks and utilities in disputes of this nature. Our GD2 forecast reflects this but given the uncertainty around these claims, we believe an uncertainty mechanism to protect consumers and GDNs would be appropriate.

Alterations

Service alterations are primarily driven by work at domestic and small commercial properties, with fewer than 2% on larger commercial services. Workloads are generally consistent year on year. This workload also includes fixing meters and reconnecting the customer's outlet pipework where the customer asks us to carry out this work. Most of this workload (3,800 a year on average) is fully chargeable to the customer. However, as a gas transporter we have obligations to alter services free of charge for priority customer groups. These number more than 100 a year and are set to rise based on government statistics as a result of an ageing population and as health issues increase.

Isolations

This work category relates to customer-led disconnections, due to demolition or because gas is no longer required.

The workload is relatively consistent year on year although analysis of stakeholders' plans does show that a number of major social housing redevelopment schemes are due to start in GD2. An example is the redevelopment of 10,000 homes by Gloucester City Homes over a 20-year period from 2020. Such schemes will require multiple service disconnections and associated mains abandonment.

Gas Safety (Installation and Use) Regulations 1998 (GSR) disconnections

The GSR places an obligation on suppliers to ensure that services are left in a safe condition where a gas meter has been removed and a new meter not installed for 12 months. The workload can vary year on year and peaks have been seen in GD1 following portfolio reconciliation exercises by suppliers.

This obligation falls to the GDN as network owner. Data on removed meters is downloaded from Xoserve then cleansed using our own data, through liaising with householders and by making site visits to inspect the service. The outlined workload is associated with the number of physical service disconnections resulting from that cleansing work (typically 4,000 records result in 720 disconnections per year).

Theft of gas illegal connections

The management of Meter Point Reference Numbers (MPRNs) is key to billing customers in the gas industry. Our Connections team manages the creation of new MPRNs and the maintenance of those MPRNs because of our works. Working with Xoserve and the industry, we made changes to the MPRN creation process in 2014 to prevent suppliers from creating their own new MPRNs. This allows us to avoid duplication but also to identify potential illegal connections and to take appropriate action to make the connection safe and to legitimise it.

We have obligations under the Supply Point Administration Agreement (SPAA) to investigate theft of gas where it is either direct from our network, or through a meter but there is no registered supplier for the meter point. Stakeholders were surprised that this was an issue in the gas industry but supportive of our doing more to tackle the problem from a safety perspective and to reduce customer bills.

We have proposed a bespoke output to incentivise us to do more on tackling theft of gas. The CEG challenged us on this, in particular around why we should receive a share of the benefit from this initiative. We explained that this proactive approach benefits customers and that the sharing is asymmetric in customers' favour. However, in response to the CEG we have amended the incentive to take more risk.

Click **Appendix 5F** for further information on our engagement.

Following a CEG challenge, we have amended our theft of gas incentive to protect customers further.

4. Our GD2 commitments

Looking to the future and planning for alternative and affordable ways to meet customers' future energy needs.

In summary, our GD2 investment will provide connections in a timely way to an affordable and reliable source of energy for more than 30,000 new households each year (including those connected by the IGTs). It will also ensure that we are able to continue to support the energy transition by providing flexible gas generation to the district heat network, and to fuel vehicles.

When responding to requests for new connections, we take pride in offering a service that meets the customer's individual needs. We always do our best to perform well above the guaranteed standard of service timescales when it comes to providing quotations, undertaking the connections work itself, and carrying out any reinstatement work that is required.

Chapter 17. Connecting homes and businesses (continued)

5. GD2 outputs

We believe that performance against the FPNES is essential as one of the ways in which we can support customers who are in fuel poverty. We have encouraged Ofgem to include performance as a GD2 output and this has now been defined by Ofgem as a Price Control Deliverable.

We are seeking a volume driver as opposed to an absolute target – reflecting the uncertainty in energy markets and in funding for heating systems.

Connections ouptuts — Click **Appendix 3A** for further justification on these outputs

Measure and type	Explanation	Proposal/target	Stakeholder views	2018/19 performance	Comparative performance	Other requirements	Customer benefits
Common output measures with bespoke target							
Fuel poor network extension scheme (FPNES) PCD	Funding of first time gas connections to eligible fuel poor homes.	A total of 2,500 connections (£8.2m) to fuel poor homes in GD2 - 700 per year in 2021/22 reducing to 300 in 25/26.	Customers support the FPNES where gas is the best option for the home. CEG and RIIO-2 CG would like us to be more ambitious but they accept our caution given the lack of visibility of funding for central heating systems.	1,083 connections.	On target in GD1 along with SGN Scotland and NGN. Unlike SGN Southern and Cadent who are at risk of missing their target.	Ambition limited by third party funding for first time central heating systems. Ofgem require partners to demonstrate gas is the best option for a property for FPNES funding to be provided.	Homes that receive a connection will save on average £680 a year on heating bills and improvements to health and wellbeing, delivering wider societal benefits as measured by our SROI tool.
Bespoke outputs measures							
Theft of gas ODI F CVP	A bespoke financial ODI to increase the proactive work we do to tackle theft of gas by commercial and domestic customers.	First £250k pa recovered given to customers, next £50k payable to WWU to cover admin costs and all money recovered over £300k shared 50:50.	Stakeholders support being more proactive to tackle theft of gas for financial and safety reasons. CEG challenged this incentive and we revised it to protect customers further.	£326k recovered. 165 cases of theft of gas stopped.	Total of £2m recovered over past five years – one of the leading networks based on population.	Ofgem has previously been supportive of further GDN work in this area. Ambition to recover over £2.5m in GD2.	Customers will benefit by receiving the first £250k of any income we recover, plus 50% of any amount above £300k. The safety risk at those sites is also removed.

Chapter 17. Connecting homes and businesses (continued)

Theft of gas

Our commitment

Do more to proactively identify theft of gas to protect the safety of our customers and to support fair charging; we propose a bespoke financial incentive to support this.

Tackling the theft of gas to keep our customers safe and to support fair charging.

We propose a bespoke output on tackling theft of gas. We have obligations under the SPAA to investigate direct theft from our network or in cases where gas is being used and there is no registered supplier. Until 2014/15 we carried out only our necessary commitments, which was to act on reports and tip-offs.

Since then however we have set out to do additional work alongside our existing processes to proactively identify gas theft and recover costs. Over the past five years, we have recovered £2.2m, making us the leading gas network along with Cadent London.

Under this output, we are committing to using industry data and additional resources to tackle the problem even more proactively. We will also put dedicated resources into this work at an additional annual cost of £50k and work with industry partners to tackle the problem.

CVP

For every £1 invested in tackling theft of gas, customer receive £20 of net value.

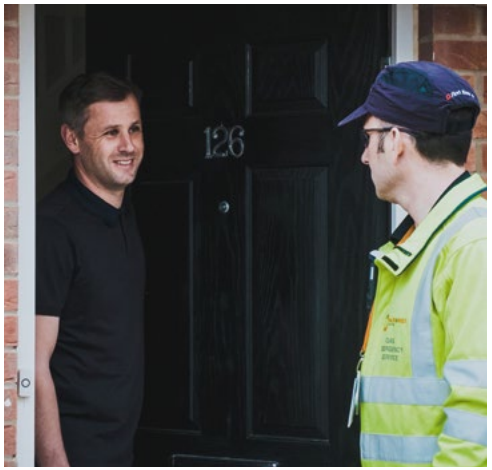
£2.2m

Over the past five years, we have recovered £2.2m, making us the leading gas network along with Cadent London.

Where we recover less than £250k, we will only recover the costs we incur in recovering money from customers. We will be incentivised by keeping 50% of the income recovered above £300k. Customers will benefit with more money flowing back to them in year one than if we had just met our obligations. This bespoke output contributes to our CVP.

They will also see a benefit in future years due to the theft of gas issue being closed. While we believe we have tackled some of the larger industrial users already, the additional resources will allow us to focus on more of the medium sized businesses and domestic users.

We will protect vulnerable and low-income homes in our processes by helping the customer to register with a gas supplier but not seeking to recover lost income.



Chapter 17. Connecting homes and businesses (continued)

6. Our GD2 planned activities

Based on our own data analysis, and taking account of stakeholder feedback and reports on the future of energy in the UK, the workloads we forecast to deliver during GD2 are summarised below.

Workload summary

		GD2					
► **Connections services**	**Average GD1**	**2021**	**2022**	**2023**	**2024**	**2025**	**Total**
New housing	3,949	4,039	4,043	3,971	3,988	3,863	**19,903**
Existing housing	5,209	4,821	4,735	4,649	4,562	4,476	**23,243**
FPNES	1,574	700	600	500	400	300	**2,500**
Total non-domestic services	608	610	610	610	610	610	**3,050**
Total	**11,340**	**10,170**	**9,987**	**9,730**	**9,249**	**9,249**	**48,696**
► **Connections mains**							
New housing (km)	23.2	23.2	23.3	22.9	23.0	22.2	**114.6**
Existing housing (km)	15.6	15.0	14.7	14.4	14.2	13.9	**72.2**
FPNES	5.1	2.8	2.4	2.0	1.6	1.2	**9.8**
Total non-domestic mains (km)	6.1	5.9	5.9	5.9	5.9	5.9	**29.3**
Total	**50**	**47**	**46**	**45**	**45**	**43**	**225.9**
► **Connections other**							
Alteration	3,616	3,750	3,750	3,750	3,750	3,750	**18,750**
Isolations	1,133	1,200	1,200	1,200	1,200	1,200	**6,000**
GSMR disconnections	721	720	720	720	720	720	**3,600**
► **LTS**							
LTS connections	0.2	1	0	1	0	1	**3**
LTS diversions	2	2	2	2	2	2	**10**
► **Third party**							
IGT/UIP final connections	–	10	10	10	10	10	**50**
► **Reinforcement**							
Specific reinforcement (km)	7.9	11	12.8	11	10	10	**54.8**
General reinforcement	7.6	7.4	7.4	7.4	7.4	7.4	**37**
Total reinforcement	–	18.4	20.2	18.4	17.4	17.4	**91.8**
► **Diversions**							
Rechargeable (km)	7.0	7.6	7.7	7.7	7.7	7.7	**38.5**
Non-rechargeable (km)	1.7	1.1	1.5	1.5	1.5	1.5	**7.1**
Services on diversions	–	60	60	60	60	60	**300.0**

Facilitating competition in connections

The IGTs have more than 300,000 customers connected to our network (as of March 2019) and connect more than 20,000 new services each year. In addition, Utility Infrastructure Providers (UIPs) lay 500 services a year which we then adopt. We forecast that during GD2 we will enable 150,000 connections to be made to our network by the IGTs and UIPs. We will continue to facilitate competition in the connections market by:

- Sharing data on our network.
- Continuing to offer a high level of service to these organisations to ensure that the application and design approvals process is smooth and efficient, and that we then complete any reinforcement required in a timely manner.
- Continuing to monitor the safe control of operations when third parties are working on our network.
- Undertaking risk-based site audits and work with those companies and the Lloyds Register (which operates the Gas Industry Registration scheme) to drive best practice and address issues.
- Providing the emergency service through contracts with the majority of the IGT sites. We will ensure that vulnerable customers on these sites are protected, in the event of an emergency, in the same way as we protect customers who are connected to our network.

Chapter 17. Connecting homes and businesses (continued)

Comparison with other GDNs' charges

To ensure that we provide value for money for our customers we compare our standard charges against the published standard charges of other GDNs on an annual basis. We are pleased to report that we are either the cheapest or second cheapest of the GDNs while recovering all reasonable costs from the customer.

GDN connection charges – new domestic services (inc. excavation and reinstatement)*

* As of December 2018.

7. Costs

To deliver our commitments we require a total of £108m of allowances to meet our Licence Obligations (Domestic Load Connections Allowances, reinforcement and funded alterations), the FPNES, and requirements under the NRSWA Diversions Code of Practice and the Gas Safety (Management) Regulations 1996 over the five-year period.

The workloads and unit costs for each activity are broadly the same as for GD1 (excluding inflation and real price factors).

The main difference in cost is for diversions, with the increase being driven by a higher LTS workload. This is the result of development of new housing and commercial sites on the outskirts of cities and towns. We are seeing more cases where the easements put in place up to 50 years ago either have a 'lift and shift' clause that puts all costs back on the GDN to move the pipe, or the easement or the developer is challenging the validity of the easement because the pipe is in a slightly different location. The impact of this is that a greater proportion of the costs of LTS diversions are borne by the GDN, resulting in the increase in average net costs.

8. Options

When customers request a new single service connection there is little option other than considering the route to ensure it is the lowest cost possible within the customer's requirements. For requests to connect multiple properties requiring new mains and services, we have optimisation tools that will consider all combinations of pipe sizes to identify the lowest cost solution.

If our current gas network does not have the capacity to supply the gas volumes required by a new customer(s), we will look to reinforce the network. We will consider many options to make this capacity available including:

- elevating system pressures where the impact on leakage is minimal;
- connecting discrete networks;
- targeting repex;
- renegotiating pressure commitments with existing customers, particularly the IGTs.

All options are considered based on viability and cost benefit analysis (CBA) so that the lowest cost solution is delivered to customers. Where we are aware of further growth in an area, we will consider this when designing reinforcement options to deliver the overall lowest whole life cost.

9. Innovation

Any innovation in the connection business will need to be part of business as usual and show a clear benefit to us and to customers if it is to proceed:

- More self-service options for developers to get quotes, accept and pay for work and to track their projects (Click Chapter 6).
- Heat mapping to help developers identify areas with capacity for gas entry and exit.
- Innovation in engineering techniques to reduce excavation sizes, reduce the time to complete works, and to reduce costs of back fill and reinstatement materials, with cost savings passed on to customers via our charging methodology.
- Geo-referencing of photos, videos and records to ensure that our records are accurate, help engineers and designers to identify issues, support customer communication, and drive a 'right first time' delivery of the quotation and work on site.

An innovative technique 'Minimuss branch saddle connections' is delivering a £300k/yr saving by completing flow stopping in half the time.

Conclusion

Our connections investment will mean that we are able to continue to meet the needs of our local communities and wide-ranging customers, building on the high-quality service that we provide.

Our connections plan aligns with the single scenario that was set out in Chapter 13: Our net zero ready vision for 2035, which is predicated on the need for gas. This analysis provides strong evidence that gas continues to have an important role to play in the move to create a dynamic, flexible, integrated, and green energy system.

Chapter 18. Transmission and pressure management

1. Highlights of our plan

- To maintain current performance on safety and reliability and to meet the needs of our stakeholders – from end users to power generators and the renewables sector – we will invest £27.4m a year in GD2 in our transmission and pressure management assets.
- These assets transport large volumes of gas at very high pressures; as such there is a significant safety and security of supply risk if they are not well maintained and managed.
- Our plan will ensure that we continue to comply with the regulations governing this critical part of the gas distribution system – the Pipeline Safety Regulations (PSR) and the Pressure System Safety Regulations (PSSR). These regulations reflect the inherent safety risk of transporting gas and require us to keep these assets in a good state of health.
- These assets have benefited from very targeted and significant capex programmes in the price controls prior to GD1.
- As a result of the construction standards that were in place when the pipeline in mid and north Wales was originally built, we face a challenge that is not experienced by any other GDNs. Our plan includes investment in GD2 to manage the integrity of these pipelines.
- To deliver best value for customers in this area we adopt a whole life costs approach, supported by extensive cost benefit analysis (CBA). This approach has led to lower costs in GD1 that will continue through to GD2.
- The transmission network has substantial storage capacity and is critical to balancing supply and demand to meet stakeholders' needs. We deploy 59.4MWh of storage each day – the equivalent of 11.8 million Tesla Power walls.
- Malicious damage to these assets is a real threat and we have engaged with the Government's Counter Terrorism Security Agency (CTSA) on our planned investment in security.

Most of the GD2 planned costs are broadly similar to those of GD1 as we continue our successful refurbishment programmes, which have maintained the health of our assets.

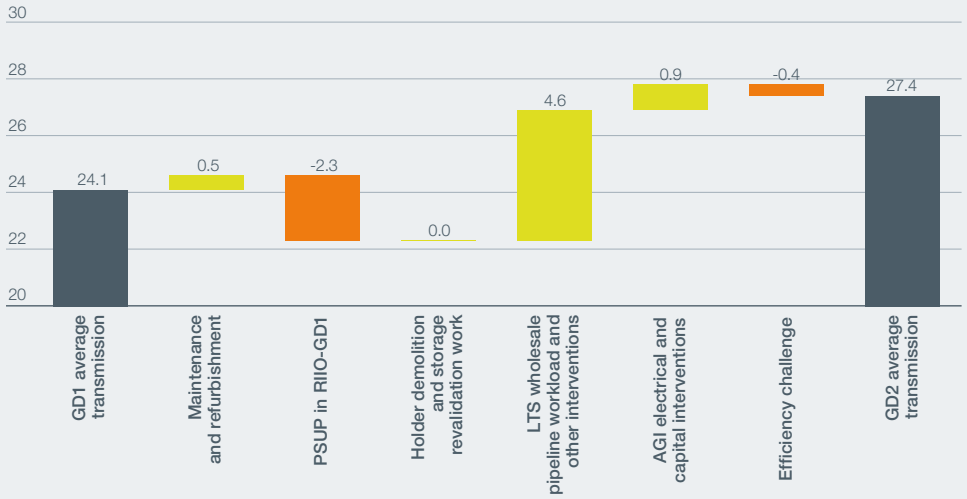
An exception to this is LTS pipelines, where the cost is increasing as a result of a higher workload – reflecting our planned replacement of 13km of pipeline in GD2. We have refurbished a good number of pipelines successfully in GD1, with the exception of a 13km section that continues to deteriorate despite our interventions. CBA is showing that from a whole life cost view the best result is now to replace this pipeline.

Another area of cost increase is LTS diversions. These diversions are customer driven and costs are increasing due to a significant increase in development, which results either in our moving pipelines or our compensating for loss of potential earnings if the pipeline cannot viably be moved.

Investing in transmission and pressure management

Investment	GD1 £m (pa)	GD2 £m (pa)
Maintenance and refurbishment	9.0	9.5
Pressure management	10.9	9.2
Pipelines	3.4	7.9
Holder/storage	0.8	0.8
Total	**24.1**	**27.4**

Transmission GD1 average v GD2 average 2018/19 prices



Chapter 18. Transmission and pressure management (continued)

2. Introduction

Our transmission and pressure management assets move substantial volumes of gas at high pressure from the National Transmission System (NTS) to the local distribution pipe network. The assets represent a critical part of the network as a single failure could impact on many thousands of customers. As the network is used to transport gas at very high pressures, any leaks could have very serious consequences.

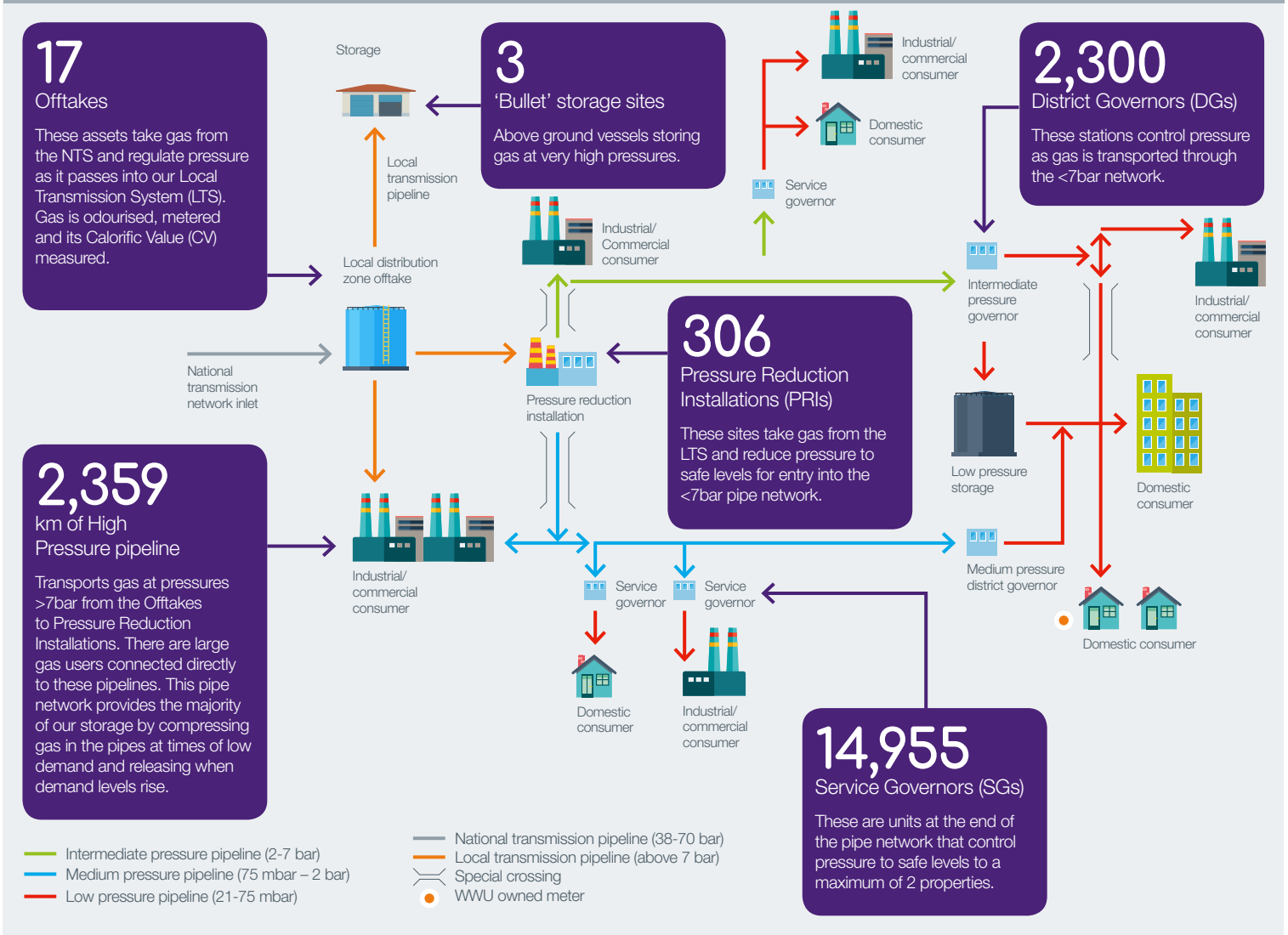
Much of our planned investment is to ensure compliance with the law and with requirements that are mandated by the HSE. We maintain best value for customers by adopting a whole life costs approach and using CBA so that we are neither 'gold plating' nor under-investing.

We are responsible for assets that are deemed by the Government to be Critical National Infrastructure (CNI). We work with BEIS to agree and implement the Physical Security Upgrade Programme (PSUP). We undertook the full range of work to protect our assets that was required during GD1. We have consulted with BEIS and with the CTSA on our GD2 plans in this area.

This chapter is presented in three main sections:

- How we will manage our transmission and pressure management assets in order to maintain safety and reliability.
- Operating the network – how we will address the challenge of balancing the network in real time, as demand and supply patterns become more variable.
- Physical security – how we will protect the assets from malicious damage.

Our asset network



Chapter 18. Transmission and pressure management (continued)

3. Customer and stakeholder feedback

Striving for clean and affordable energy, understanding the needs of businesses and how our network will be used in the future.

A significant majority of customers in a quantitative research study (base 1000) have told us that reliability is their top priority (Impact Utilities). Feedback states that current levels of safety and reliability are good and there is little desire to spend more to improve. We have listened to this feedback and our investment and delivery plans reflect this.

We have sought views from key regional and national stakeholders through events across our network. In summary:

- HSE, BEIS and emergency planning committees stress that large-scale supply issues or gas explosions are not tolerable to society.
- The electricity sector and power generators tell us that reliable gas generation is critical to balance intermittent renewables (solar and wind) and that storage in our network is vital to balancing the region's energy needs – and that this will continue to be the case in the short, medium and long term.
- BEIS and large gas users say that a reliable supply is essential to the local and UK economies.
- Gas consumers are happy with service levels and do not wish to pay more for improvements in this area.
- We shared our security plan with CTSA in late 2018. Their feedback resulted in a reduced investment plan – £6m less than the original forecast.

To avoid investment solutions to capacity challenges we have gone out to our large users with the option of lower bills in return for the ability to interrupt their supply to help balance our network. In each year we have done this, there has been no take-up, despite the potential for significant cost savings for businesses. We will continue to innovate in our engagement process in the hope of stimulating positive responses but the feedback to date does show the value businesses place on an extremely reliable gas supply.

There are a limited number of network users that are impacted directly by this asset group, including green gas producers, flexible power stations, and large industrial users. We have a dedicated team that engages with this group to cater for their individual service requirements. As an example of this, in practice in GD1 we have manually reconfigured networks in order to maximise green gas capacity. Through our innovation project OptiNet we are developing intelligent control systems that will provide further capacity to green gas producers in GD2. We have formed and chair a transmission strategy group for the GDNs/Gas Transmission (GT) to share best practice, look at the future challenges associated with managing this network, and ensure that investment is targeted at the optimum part of the NTS/LTS system – thereby minimising costs to consumers.

Click **Appendix 5F** for further information on our engagement.

4. Our GD2 commitments

Making sure that high pressure assets are maintained and operated correctly.

This part of the network moves substantial volumes of gas at high pressure and controls that pressure as it enters the distribution network. The significant risks associated with this activity, which we must manage, are:

- interruptions to gas supply;
- a loss of containment, resulting in an explosion;
- disruption to UK infrastructure or displacement from homes and businesses as a result of large gas releases at high pressure.

Reflecting these risks, the way in which we maintain and operate this network is governed by various sets of legislation, most notably the PSR and the PSSR. Much of the investment that we plan for GD2 is driven by these regulations Our GD2 commitment is to "keep the level of risk in relation to these critical assets at their current acceptable levels in order to maintain our excellent performance on safety and reliability".

We will have removed £9m of risk above our GD1 commitment.

5. GD2 outputs

► The network asset resilience measure (NARMs)

The key output measure for this group is the NARMs (formerly network output measures, NOMs). There are two outputs under NARMs – capacity and monetised risk. These two outputs provide holistic measures of safety and reliability performance.

NARMs have an important role to play in assessing the benefit of asset intervention plans across all sectors and measuring a GDN's performance in managing asset risk. We forecast to outperform our NARMs target in GD1 by removing £9m of risk above our GD1 commitment as a result of our targeted asset intervention strategy.

Very simply this means that through our GD1 investment we have improved reliability, improved safety and reduced the environmental impacts of these assets.

Chapter 18. Transmission and pressure management (continued)

Capacity Utilisation

The purpose of this measure is to ensure that we invest in and manage the network so that it has the capacity to supply consumers during the winter period. The measure is based on PRIs and how close they are to their maximum capacity.

The table below shows our 2018/19 position. Having no assets in >100% category illustrates that we are achieving the output and not putting supply to consumers at risk, even in the harshest winter conditions. In addition, having 55 assets in the 80-100% range demonstrates that we are stretching the assets and not investing until required.

Capacity utilisation

Capacity utilisation	2018/19 (number of sites)
</= 50%	156
>50% to </=70%	83
>70% to </=80%	39
>80% to </=100%	55
>100%	–
Total	**333**

Our investment plan will ensure that capacity utilisation is kept at <=100% in GD2.

The network has evolved through GD1 with a sharp rise in green gas and power station connections. Balancing supply and demand has become more complex as a result. We need to make sure that this measure stays relevant, which in the future could mean including storage capability as well as asset capacity.

£31m

In GD2 we forecast to remove £31m of risk from our network through a targeted investment plan.

Monetised risk

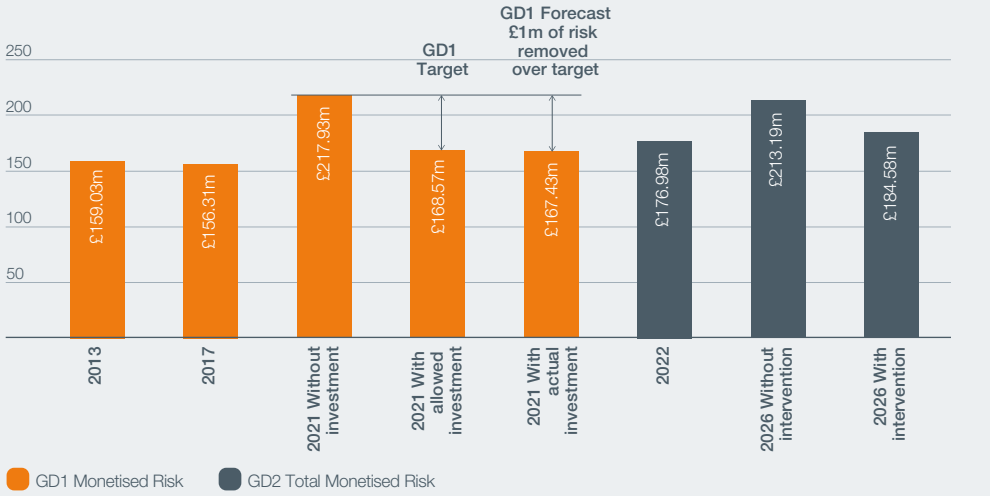
As we explained in Chapter 15, monetised risk is a metric that gives a monetised value to an asset based on its condition, probability of failure, and consequence of failure. It then determines the cost associated with that consequence.

The value is derived for:

- the start of a price control;
- the end of a price control without any investment;
- the end of a price control with investment.

The difference in monetised risk between the 'with' and 'without' investment scenario is the value given to the investment plan and is the output target. The figure opposite shows our GD2 forecast and our plan to remove £31m of risk from our network through a targeted investment plan, compared with the risk level with no investment plan.

GD1 versus GD2 monetised risk



The above risks have inflation removed from GD2 for a like for like comparison to GD1.

NARMs has a significant role to play in assessing the benefit of asset intervention plans across all sectors. Our GD2 plan is designed to keep network risk at the end of GD2 at a broadly similar level to that at the start.

This will maintain our current levels of safety and reliability, in line with the requirements of our stakeholders.

While this approach may not seem ambitious, it is driven by feedback from our stakeholders that they are happy with current safety and reliability performance and do not wish to pay more for improvements.

We see GD2 as being a key price control for learning from the NARMs assessment and testing its potential as a benchmarking tool across networks. Although it is not mature enough to be used to set GD2 allowances, we support an aspiration to get to this point for GD3.

NTS exit capacity

This output incentivises us to accurately book and minimise capacity reserved from the NTS. This ensures we do not overestimate our network usage resulting in unnecessary cost to the transmission operator and preventing other users from booking capacity they require. This has worked successfully in GD1 and we support the continuation of the measure in GD2.

Chapter 18. Transmission and pressure management (continued)

Other outputs

We propose some other targets to measure our performance in managing these asset groups. These are detailed below:

Transmission and pressure management outputs — Click **Appendix 3A** for further justification on these outputs

Measure and type	Explanation	Proposal/target	Stakeholder views	2018/19 performance	Comparative performance	Other requirements	Customer benefits
Common output measures with a common target							
National transmission (NTS) exit capacity ODI F	The value of NTS flat capacity secured to meet 1:20 peak demands against a baseline set in the final determinations. To incentivise GDNs to minimise flows on the NTS to reduce consumers' costs.	Our proposed target will be based on NTS capacity bookings made through the 2020 applications process.	Customers support keeping bills to the lowest practical level. Engagement with shippers and the industry shows support for discussions around how unsold capacity can be used most efficiently.	£0.46m (nominal) incentive reward.	8-yr incentive income: WWU £3.6m Cadent £147m SGN £42m NGN £10m	There is joint industry work ongoing in this area through the Transmission working group which may result in future changes.	Customers will continue to benefit in receiving a share of the financial incentive.
Gas holder demolitions PCD	A programme of work to demolish redundant gas storage assets.	We will demolish the last five holders on our network in GD2.	We engage with the HSE on this issue through bi-annual meetings and the removal of these redundant assets is supported.	We have demolished eight holders in GD1.	We have fewer remaining holders than other GDNs and have exceeded our GD1 target for less than our allowance.	We will try to offset the cost with land sales where possible.	This investment will remove all environmental and safety risks posed by these assets and reduce future operating costs to zero.
Physical Security PCD	PSUP is directed by BEIS requiring security fencing, gates, cameras and access systems linked to our system control room at several key sites where we take gas from the NTS.	No further work is required at this stage. We support a re-opener in this area if legislation changes in GD2.	When we shared our initial plans with the CTSA their feedback was that the level of investment planned on some sites was not necessary and we significantly reduced our investment in this area as a result.	We complied with requirements in GD1 by completing the work required under the PSUP at a cost of £18.6m.	Annual Regulatory Reporting and through GDN working groups.	We are not required to undertake further work to comply with the PSUP programme at this stage. We will continue to work with the CTSA to ensure that our plans remain relevant and appropriate to the perceived risk.	Investment in security protects critical sites from malicious attack. This significantly protects our consumers from large-scale gas interruptions.

6. Maintaining the network

Making decisions based on asset and financial data to improve and maintain infrastructure and reduce carbon emissions.

Our GD2 plan is designed to maintain the level of network safety and reliability risk. This will ensure that interruptions and safety performance are maintained at high performance levels. This is driven by feedback which tells us that stakeholders are happy with our current safety and reliability performance and do not wish to pay more for it to improve.

Deriving an intervention plan that will deliver these outcomes requires:

- decision making based on high-quality asset and financial data;
- testing our investment plans against likely future uses;
- understanding the likely impacts of the environment in which we operate the assets (through our climate change mapping).

Ensuring good quality data and analytics

We use sophisticated prescriptive and descriptive analytical capability underpinned by high-quality asset and financial data to inform our decision making.

At our inception in 2005, data on our transmission and pressure management assets lacked any granular detail and was often held in local depots and in spreadsheets.

There were gaps too in our asset population data. We have taken significant steps to address these issues:

- 2010-12; 7,000 surveys of PRIs, district governors and service governors to determine asset populations and condition data.
- 2013; Implemented Condition Based Risk Modelling (CBRM).
- 2014; Implemented Trillium (data quality assessment software).
- 2015; Fully digitised the 2,359km of LTS pipe enabling better management and detailed assessment of pipeline risk.
- 2016-19; Site surveys carried out of all service governors to determine asset populations and condition data.

Chapter 18. Transmission and pressure management (continued)

– 2017; implemented Asset Investment Manager (AIM), a powerful analytical tool to predict asset risk and derive optimised investment programmes to manage that risk.

These are in addition to our day to day collection of condition, fault and failure data including:

– Pressure reduction installations; annual inspections of safety features and condition.
– District governors; risk-based maintenance visits but condition assessment at least every six years.
– Real time site monitoring from control room systems.
– Pipelines; c.450km inspected for condition per year so all are inspected within five years.

In GD2 we will continue to support our ambitions for detailed prescriptive and descriptive analytics. We will continue to invest in our GIS, which allows us to assess the number of people, the type of property, and infrastructure such as road and rail in the vicinity of each asset. This assessment informs our understanding of the risk of death, injury or damage in the event of an asset failure.

A network fit for future energy scenarios

Gas has a vital role to play in future of energy scenarios. Our investment plan not only ensures that the gas network will meet our stakeholder requirements of a safe and reliable gas supply, but also that our network supports the whole system operation. We will do this by providing connections and capacity for local gas fired power stations that support the use of solar and wind generation.

We are very aware of uncertainties in the long-term future of energy and concerns around stranded investment in the gas network. The GDNs and electricity networks have collaborated on producing a common view of the future (the single scenario).

Click **Chapter 13: Our net zero ready vision for 2035** for more information. 110

Our investment plan is set in the context of this scenario but we have also tested it against the four National Grid FES to ensure robustness and minimise any risk of asset stranding.

Climate change mapping

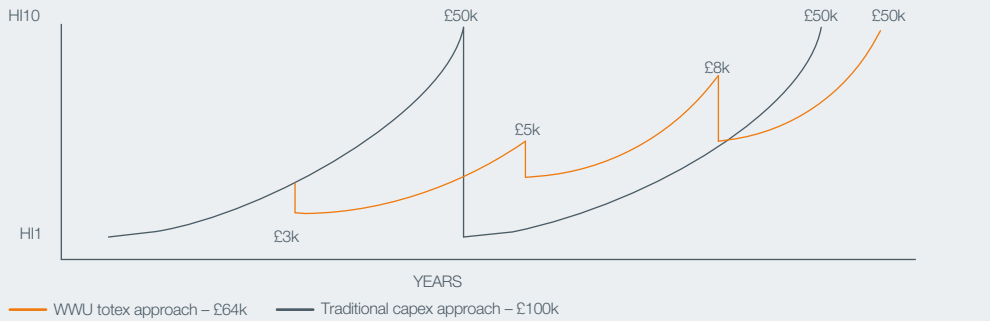
It is important we consider the impact of a changing environment on our assets and their ability to function. We have led an innovation project to develop climate change mapping capability and this will continue to evolve during GD2. This has been shared with the other GDNs and key stakeholders such as BEIS.

Analysis of this data has identified the following risks:

– River bed and bank erosion exposing pipelines.
– Flash flooding impacting bridges carrying gas mains.
– Flooding of pressure reduction installations.
– Impacts on our critical supply chain.
– Contaminant mobilisation and migration.

This analysis has not triggered significant investment in GD2 but it now forms a key part of our risk assessment process. Where we are investing in assets we carry out a climate change assessment that could influence the design of a site.

Maintaining a totex approach



7. Delivering value for money

Maintaining a totex approach

As Chapter 15 explained, our approach means we intervene regularly and in a targeted way to maintain the asset health and deliver the lowest cost management of each asset over its lifetime. The illustrative figure above shows two representational management plans for a typical district governor (DG) and two different management plans. The black line represents a capex plan with full DG replacement, which in this illustration typically costs around £50k. The orange line represents our totex approach. Here, relatively low-cost early investments to refurbish the asset (in this case costing £3k, then £5k, then £8k) extend its life considerably, thereby pushing out into the future the need for a more costly replacement.

This approach requires excellent quality data on asset condition, performance and the consequence of failure. As outlined above we have put ourselves in a strong position during GD1 in this area and this will continue to be an area of focus for GD2.

Our underlying strategy is to keep cost savings from GD1 going forwards and to avoid expensive capex replacement. We do this through our understanding of the whole life costs of the assets and by the CBA that we undertake.

CBA results

	NPV (£m)			
Asset	**2030**	**2035**	**2040**	**2050**
Pipelines	£10.79	£19.93	£28.68	£45.15
Offtake & PRIs	£42.00	£177.71	£676.90	£11,372.00
Governors	–£0.25	£2.38	£5.74	£13.84

Summary of GD2 activities

We plan to complete the following workloads to manage these asset groups, keeping our consumers safe and warm. More detailed evidence for each asset group can be found in our catalogue of our CBAs and engineering justification documents. Click **Appendix 15A**.

Chapter 18. Transmission and pressure management (continued)

- We will continue to maintain inspections of the LTSs and invest in cathodic protection systems for all pipelines. This will significantly prolong pipe life, prevent leakage and minimise whole life cost.
- In order to ensure that the existing assets deliver our stakeholders' requirements we will:
  - undertake more than 150,000 maintenance visits;
  - carry out 2,300 targeted interventions on LTS pipelines;
  - replace 13km of pipeline where refurbishment is no longer an option, as supported by our CBA[1];
  - undertake 4,200 refurbishments or replacements on pressure reduction installations.
  - undertake a full revalidation at one of our three gas bullet sites in GD2, at a cost of around £1m. This is a much more cost-effective approach to providing a significant volume of stored energy to balance the energy network in our region than using batteries or creating new storage facilities.
- There are some projects in our plan to upsize subsystems on PRIs. These are a result of analysis of the requirements for flexible generation in our region in GD2 and the investments are required to provide the system capacity needed. These are necessary to deliver our capacity output targets.

1 Click **Appendix 18A** for a report by DNVGL to review this pipeline spend.

These GD2 activities and associated investment are explained in detail through a series of Investment Decision Packs (IDPs), which are provided as appendices to our business plan. These packs are combinations of CBAs and Engineering Justification Documents (EJDs) that expand on and evidence the investment decisions we are making.

Gas holder strategy

In addition to the planned work on our live gas assets, we propose investment to demolish and remove our five remaining redundant above-ground gas holders.

Our gas holder strategy spans GD1 and GD2. In GD1 we purged the remaining live holders and removed eight of the redundant structures. In GD2 we plan to remove the remaining five.

This removes the risk of pollution and contamination of the surrounding areas, reduces risk to people trespassing on these sites, and avoids any future operating costs.

8. Operating the network

In addition to maintaining and managing our assets we need to ensure that we operate our network safely, efficiently and effectively each and every day. To do this we forecast short, medium and longer-term requirements and make sure that we have the people, systems and processes in place to meet those needs.

Real-time variability

As demand and supply patterns become more variable, the challenge of balancing our network in real time increases.

We will need to balance gas every day, keeping pressure as low as possible to minimise losses and high enough to ensure that we meet peak demands and support flexible generation, which may be required at very short notice.

We will need to reconfigure our networks, invest in intelligent controls and systems for our control room, and increase real-time data availability by connecting data sources in a clever way.

Our service in GD1 was extremely reliable – we maintained supply to the end user at 99.97%. In GD2 we will use this strength to forge ahead and manage the complexities and constraints and deliver against our commitments once again.

Forecasting

All GDNs forecast over several timescales, from 10+ years ahead to within-day. This is to support processes ranging from long-term investment to maintenance and within-day balancing, each ensuring that the network can always deliver the required entry and exit capacity and storage.

In GD1 we developed our forecasting and modelling capability, via in-house and innovation projects and increasing engagement with National Grid's FES team. GD2 activity will build on this, to improve forecasting for all key time horizons:

- 'On-the day' and next day: connect relevant data sources into our central portal, providing a real-time feed into our forecasting model. We will monitor the demand impact of flexible generation and develop models to predict their use.
- 1-10 years ahead: increase engagement with and visits to large sites on our network to understand their plans and strategies, exploring whether they could offer interruptible services to off-set other investment. We will build on learnings from our GD1 innovation forecasting projects and in some cases build these into our 'business as usual' plans.
- 10+ years ahead: gather more granular data (at a sub-Local Distribution Zone level), going beyond 'size' as a predictor for demand (e.g. purpose), as many do not have a flat demand profile. Having secured innovation funding to start using this data in GD1 to inform the FES, we will invest in this activity becoming 'business as usual' in GD2.

GD2 commitments on system operability

In a rapidly changing operational landscape, we need to continue our journey of adaptation, improvement and innovation that we have been making since our systems operations and control team migrated to our Newport head office in 2009.

- Booking NTS capacity to meet peak demands and working with industry to seek modifications to these processes to improve efficiency.
- Supporting the UK's decarbonisation of heat agenda by finding low-cost ways to connect green gas producers and flexible electricity generators onto our network.
- Introducing relevant new forecasting and capacity management tools for different load types, including generation, industry and domestic.
- Increasing the use of connected, real-time data when operating the network.
- Seeking non-investment options for capacity increases, eg interruption contracts or

Chapter 18. Transmission and pressure management (continued)

operating systems in wider ranges.

– Resourcing and training colleagues appropriately, to reflect our network's increasing complexity.

9. Physical security

The threat of malicious damage has grown significantly in modern times. An element of managing risk in relation to these assets is to ensure that they are physically secure.

In GD1, we used the uncertainty mechanism (the re-opener) provided by Ofgem. We were given the list of our six CNI offtake sites that required physical security upgrades and the scope of works required at each site. The regulator allowed us a total of £19.6m to fulfil our obligations at these sites within the PSUP.

As a result, physical security improvement works at our current Tier 1 sites was completed in GD1 and written policies developed and signed off.

We own five additional offtake sites, all in the south west of England, where the National Grid has CNI assets located on our sites. Discussions between the GDNs, National Grid, BEIS and Ofgem about which party should pay for the security upgrade work on these sites is ongoing.

10. Costs

Improving the network infrastructure will help to reduce costs.

Our GD2 plan for management of these assets benefits largely from our innovations in GD1.

The detailed breakdown of our costs is shown below:

Cost of investment plan

£m 2018/19 prices	Average GD1 annual spend	Average GD2 annual spend
▶ Routine maintenance	4.5	4.5
▶ Non routine maintenance and refurbishment	4.5	5.0
▶ Holder demolition	0.6	0.5
▶ Capital investment	–	–
▶ Governors	2.3	2.3
Pressure management and monitoring	0.4	0.3
Cathodic protection	0.3	0.1
▶ LTS storage	0.2	0.3
▶ LTS pipelines	2.2	5.0
▶ LTS Above Ground (installations (AGIs))	8.2	6.6
▶ LTS diversions	0.9	2.8
Total	**24.1**	**27.4**

We have perfected techniques for refurbishing and extending the lives of our assets. These techniques are significantly lower cost than asset replacement. Evaluation of our refurbishment strategy is highly positive and our GD2 plan reflects a continuation of this approach, along with the associated savings.

The investment plan required to deliver our stakeholder requirements and outputs is broadly similar in total cost to the level of investment in GD1, although work types vary. The exception to this is LTS pipelines where the workload is set to increase due to some condition issues on a particular pipeline in Mid Wales and a rise in customer driven diversions.

The cost of the investment plan for our current asset base is £27.4m. This compares to £24.1m in GD1.

11. Options

A key driver for investment in the transmission network is compliance with the law. For assets with such a high consequence of failure there is a balance to be struck between 'gold plating' and making sure that events that are unacceptable to society are highly unlikely to occur. As such we have shared our plan with HSE to ensure their buy-in to the balance we have struck. We have discounted age-based or time-based investment plans in favour of more sophisticated risk-based plans derived using predictive and prescriptive analytics. To ensure that our investment plan is no regrets and does not result in asset stranding we test our plan against all credible future energy scenarios. One of the key ways we do this is to test investment using a detailed CBA with varying payback periods considered.

12. Innovation

Much of our innovation on managing these assets in GD1 is related to data and analytics to take our risk assessment and risk management to even greater levels of sophistication. We will continue to collaborate with others to discover and develop effective solutions to manage this ageing asset population using the latest digital solutions to identify, monitor and manage how they will fail, when they will fail and what the causes of failure will be.

Our projects have and will continue to recognise best practice technology for asset repair and rehabilitation without impacting on our excellent safety and reliability performance.

Launched in April 2018, we are spearheading a cross-industry pioneering project to establish a standard, network-wide framework for drone use that could revolutionise the way we monitor and maintain these assets. When this project completes in January 2021, it is envisaged that our industry will be able to use drones for operations currently prohibited by the Civil Aviation Authority and potentially unlock even more applications for the technology in the energy industry in future.

Conclusion

This plan will enable compliance with UK law and will broadly maintain the health and therefore the performance and service provided by the transmission and pressure management assets.

It will deliver a network that supports future energy scenarios and satisfies the needs of key stakeholders – from end users to power generators and the renewable sector.

Chapter 19. Workforce resilience

1. Highlights

- Our Workforce Resilience Strategy will ensure that we have a sustainable workforce to deliver our services safely for our customers and one which reflects the diverse communities we serve.
- We are unique as a GDN, serving very different communities across different nations with varied demographics. Our strategy is agile and seeks to recruit, retain, develop and engage to drive and enhance workforce resilience and diversity.
- We want to attract and retain a skilled and talented workforce and will do this by:
  - maintaining our colleague and customer centric and values-based culture;
  - committing to positively promoting our business and the wider industry through effective recruitment and retention strategies;
  - making diversity and inclusion central to our people practices;
  - planning effectively for the future by continuing to invest in upskilling, cross-flexing and development;
  - working hard to maintain high levels of colleague satisfaction;
  - being flexible in our delivery model.
- We have a detailed people plan which outlines how we will deliver workforce resilience between 2021 and 2036.
- We are focused on the health and wellbeing of all colleagues – recognising a 'whole person' approach.
- We plan to collaborate with other GDNs and DNOs to create a consistent way to measure workforce resilience.

2. Evolving our Workforce Resilience Strategy

Providing numerous training opportunities and upskilling colleagues for the future.

Our strategy has been developed based on feedback from 2,327 customers and stakeholders, following consideration of our external risks and influences.

Customer and stakeholder feedback

External uncertainties, technological advances and future energy scenarios require us to continue investing in the skills and resilience of our workforce.

Appropriate investment in training will help meet our customers' expectations and CHAID analysis on our replacement customer feedback demonstrated that the "skill and professionalism of the workforce is a key driver of the customers' perception of quality," and this in turn is a driver for satisfaction.

Engagement informing our commitments

Our engagement with expert stakeholders told us that our July commitment of "Maintaining our Investors in People accreditation" was not important to them, so we have removed this as a high-level commitment, although it is our intention to retain our accreditation to satisfy ourselves that our people practices are of a good standard.

Our Critical Friends Panel and Trade Unions gave strong feedback that apprenticeships should be a clear focus within this strategy, so our revised commitment reflects this. The new commitment was borne out of the merging of two workforce resilience commitments we proposed in our July plan, and the new version that features in this plan was reviewed and endorsed by our CFP in September 2019.

Through the national collaborative GDN stakeholder engagement, the ageing workforce was raised as a concern with recognition of a high number of retirements, with participants asking networks to focus on attracting, training and retaining skilled staff for the challenges of GD2 and decarbonisation.

Trade unions were pleased to see that we have reflected on and responded to the prominent issue of pay gaps and our focus on upskilling and multi-skilling of colleagues has been well received.

Although SMEs did not consider this commitment as important as many others, it came third in relation to their willingness to pay.

We serve diverse communities across different nations with varied demographics and stakeholders have told us it is important that our workforce is best placed to deliver for all our customers. Our commitment to be inclusive and better reflect the communities we serve was clearly supported by stakeholders at regional workshops. This was viewed as the right approach, rather than having specific targets in place. However, it is appreciated that there are challenges in the industry to achieve this as evidenced by the research undertaken with EU Skills.

Click **Appendix 19A** for an EU skills paper on headcount requirements to 2036 for WWU.

Click **Appendix 19B** for an EU skills paper on headcount requirements to 2036 for all GDNs.

MPs have challenged us to make better use of social media to drive female recruitment, and regional workshops touched upon the importance of this medium to attract hard-to-reach individuals and those living in rural areas.

The CEG challenged us in relation to the limited scope of our diversity strategy. Our initial business plan commitment in this area made specific mention of BAME employees but following the CEG's challenge and feedback from other stakeholders around the omission of people with disabilities and the LGBTQ community, we have amended the commitment to reflect all aspects of diversity.

Click **Appendices 19C** for our Diversity strategy.

Click **Appendices 5F** for further information on our engagement.

Chapter 19. Workforce resilience (continued)

Our progress so far

During GD1 we have invested significantly in the skills and development of our people, focusing on all aspects of our colleague journey.

We have substantially evolved and modernised our approach to recruitment, incorporating the use of technology and more localised campaign deployment; invested in bespoke development programmes and technical apprenticeships; and transformed our colleague engagement practices, resulting in our silver level accreditation with Investors in People in 2017.

We have been innovative in our thinking, for example we have removed the requirement for unnecessary entry qualifications for apprenticeships which was instrumental in us winning the CIPD Wales Apprenticeship Programme of the Year Award in 2017.

Workforce Resilience challenges

The UK gas distribution network is facing an impending 'cliff edge[1],' due to an ageing workforce (the south west of England has the highest percentage of retirees)[2].

This, along with growing political and economic uncertainty, means that our ability to attract, develop and retain the right people to deliver in the future is likely to be harder.

Our main challenges are listed below:

Increasing labour shortages which result in a concern over our ability to attract and retain colleagues with key skills. In the UK, we are currently witnessing the lowest unemployment rate since the 1970s, resulting in a skills shortage.[2] There is a national shortage of suitably qualified employees and school leavers with the relevant qualifications for our industry.[2]

Specialist operational and IT skills such as data scientists and cyber security are in high demand.[2]

Our requirement to have Chartered Engineers for our safety case means we must 'grow our own', investing long-term in graduate entry routes and internal development programmes to support qualifications.

In GD2, we will need to compete further for talent. We expect to see more colleagues leaving for above market rate salaries to the nuclear and transport industries. We have already experienced the migration of a high number of our skilled contractor workforce to neighbouring gas networks who are offering premium rates to complete their replacement programmes. High value local projects, such as the Hinkley point nuclear power station and HS2 infrastructure project have also started to have an impact and this has required us to look at reward packages to ensure we are competitive, with the impact of increasing salary rates.

Restricted influence over our contractor workforce. We continue to see significant contractor workforce churn due to market forces (44% in 2018) and contractor turnover in the gas industry is expected to reach 80% over the next seven years. We currently do not have control over the way our contractors recruit, develop and retain their workforce.

A shift in role requirements. As the energy transition gains momentum, we see the potential for stranded resources across our business with certain roles becoming superfluous; – eg in GD2 the SMART metering roll-out should be completed. New roles (some of which are currently unknown) will also become essential due to the energy transition and changes in technology, and we may need to recruit for these roles externally.

A move from traditional IT roles is forecast, with more cloud, encryption and automation engineers and data scientists being required in-house to ensure the organisation is able to adapt to changing needs quickly and without incurring additional costs.

An ageing and multi-generational workforce. Our industry does not currently reflect the communities we serve. Although the percentage of BAME employees across the UK workforce continues to increase, the number working in gas distribution is 8%, compared to 15% in the UK. EU Skills suggested that we should aim for a BAME representation of 4%. Currently, 17% of our employees are over 55, compared with a UK workforce average of 20%. We are also seeing an increase in over 65s working and a decrease in retirement.[3] Currently, our youngest employee is 16 years old and our oldest is 72. This means we will have an increasingly diverse workforce with radically differing training requirements, learning styles, engagement needs and reward preferences.

The issue of fatigue is becoming more prevalent. We have traditionally covered the need for 24-hour working via a day shift plus standby or shift patterns or a combination of both, within Working Time Directive requirements. Going forward, we will need to work with the HSE to ensure compliance with guidance and the safety and wellbeing of our employees.

The impact of staff turnover. We have seen turnover more than double during GD1 from 3.26% to 7.42%. The median rate of turnover in the UK has also increased and currently sits at 16.5%[3] and we expect this trend to continue into GD2. For contractors this is as high as 44%. Changes in pension legislation has driven a significant number of colleagues with Defined Benefit pensions taking their pension early – and in some cases joining alternative employment. On the other hand, our retention rate in our apprentice population is around 90% as a result of our excellent training, clear reward strategy and overall commitment to providing good apprenticeships.

Increased turnover comes at a cost as each new recruit must be inducted and trained. We have responded to this by investing more heavily in our directly employed operating model. In 2014, the directly employed headcount was around 1,300, and in 2019 this has risen to nearly 1,600. Our total enterprise headcount has remained the same.

Click **Appendix 19A** for further information on the EU Skills papers on headcount requirements to 2036 for WWU.

Click **Appendix 19B** for further information on the EU Skills papers on headcount requirements to 2036 for all GDNs.

INVESTORS IN PEOPLE | Silver

We were very proud to be awarded a silver accreditation by Investors in People in 2017 as this highlights our focus on good people practice. This approach will underpin our Workforce Resilience Strategy for GD2.

1 Sector skills council – Energy & Utility Skills.
2 EU skill report, August 2019.
3 CIPD: Resourcing and Turnover report 2017.

Chapter 19. Workforce resilience (continued)

3. An overview: our Workforce Resilience Strategy

Recruiting, retaining and upskilling to create a resilient workforce.

We have been proactive in workforce planning since WWU was established in 2005. We have been working with sector skills council EU Skills since the 2008 price control, initially to support our regulatory planning, but used as part of our business-as-usual manpower and skills planning processes.

Our workforce plan has evolved into a Workforce Resilience Strategy in advance of GD2 and is focused on supporting us to continue to deliver sustainable individual and organisational performance, with colleagues who are engaged in creating a long-term future for our network.

Our objective is: "To enable the organisation to meet and exceed the needs of our customers and stakeholders by developing and maintaining a skilled, confident and resilient organisation that is representative of the communities we serve and contributes to the economic sustainability of our regions". We will achieve our above objective via our three guiding principles of inclusivity, transparency and continuous improvement.

Our approach and delivery complements our colleague journey. We believe that investing in Attraction and Recruitment, Skills and Development, and Employee Satisfaction and Retention – whilst continuing to measure Workforce Resilience – will enable us to deliver customer satisfaction, increase productivity and enhance our performance.

4. Delivering our Workforce Resilience Strategy in GD2

Delivering on our transparent workforce strategy and improving diversity in the workforce to reflect the communities we serve.

Our Workforce Resilience Strategy

Increasing productivity, enhancing business performance and driving organisational commitment into GD2 and beyond.

Attraction and recruitment

We will continue building our reputation as an employer of choice so that we attract good quality candidates and are able to select talented individuals who share our values. Regionalising our recruitment activities and methods to make our roles relevant and accessible to potential recruits has been well received by candidates (see case study on page 184), so will be an ongoing part of our strategy.

Our commitment

Deliver a Workforce Resilience Strategy to maintain and evolve the skills of our people to meet our customer needs now and in the future; including the ongoing investment in high-quality apprenticeships to levels three and four.

Our GD2 commitments and activities

To attract and recruit the right people for the right roles in GD2, we commit to:

- maintaining a transparent workforce resilience strategy which protects and develops skill levels and addresses operational and specialist skills gaps we face in the future;
- improving the diversity of our workforce to better reflect the communities we serve, having signed up to the sector 'Inclusion commitment' in February 2019. We are already working to address diversity gaps, both individually as WWU and collaboratively via membership of an EU Skills working group.

We are also taking proactive steps to widen our approach to make ourselves more inclusive and accessible to other 'harder to reach' audiences such as parent returners and service leavers.

At WWU, diversity is about recognising the value of difference, and inclusion is about being fair and making sure we get the best from everyone, regardless of gender, any disability, ethnicity, sexual orientation or age.

The following areas will be our focus in GD2:

Gender: Overall, 17% of our colleagues are female, with 45% of those based at Head Office being female.

The level of female recruitment into operational roles has traditionally been low. However, we are seeking to address this; 6% of our apprentice recruits since 2008 have been female and in our 2018/19 apprentice campaign we attracted 8% of female applicants via improved digital targeting and 20% of those applicants progressed to assessment.

We have a positive Gender Pay Gap with our mean gender pay gap currently at 8% and our median at -8%, although our mean gender bonus gap is 57% and median is 28%, primarily due to the gender mix of our most senior colleagues.

We are working with the Chartered Institute of Personnel Development, Business in The Community and BAME representatives to evolve our recruitment practices to make ourselves more attractive to minority groups and open our opportunities via localised advertising.

Ethnicity: 4.5% of the population of working age in the south west of England identify themselves as BAME and the percentage is slightly less in Wales at 3.9%. We do not currently track the ethnicity of colleagues although this is currently under review, particularly in light of the Government requirement for us to report on the Ethnicity Pay Gap.

When we have a process to capture this data, it is our intention to put targets in place for improvement.

Chapter 19. Workforce resilience (continued)

Disability: We are committed to equal employment opportunities for people with disabilities and take affirmative steps to employ, retain and advance qualified individuals with disabilities at all levels – this includes a comprehensive in-house Occupational Health service and a sensitive and pragmatic approach to redeployment when someone is no longer able to fulfil the requirements of their role due to disability. We have a good track record of redeployment and making adjustments to roles to support colleagues where there are changes to their psychological or physical health.

General accessibility: We are focused on making ourselves accessible to all by making it easier to join our team eg removal of qualification requirements where possible. We also promote the benefits of being a values-based organisation and recruit people who share our values. We strongly believe that we can help colleagues develop new skills if they have an approach aligned to our culture.

By taking a regional approach to improving our diversity levels, we will work hard to make sure that our workforce better reflects our different and diverse communities.

Sharing best practice with others will be key to ensuring we can be considered a 'great place to work.' We are already collaborating with WPD and Welsh Water on diversity and inclusion, taking a localised approach. We are part of several national working groups – both inside and outside our sector – so that we can benchmark and share ideas on engagement and other people matters.

Our commitment

Continue to make our workforce inclusive, ensuring it better reflects the communities we serve.

Skills and development

We need to have the right people in the right roles with the appropriate skills – at every level of the business – to maintain a sustainable and resilient workforce. Our methods of training are appropriate and we focus on providing a broad range of development opportunities to support the retention of key individuals and levels of competence.

Our GD2 commitments and activities

To address these challenges, we commit to:

- **maintaining high-quality apprenticeships** to Level 3 or Level 4 working alongside the relevant bodies such as EU Skills and City & Guilds, and offering access to further education opportunities;
- **collaborating with other GDNs where specialist or 'niche' training is required**; this is particularly vital in areas where there is a lack of experienced and qualified trainers such as Electrical & Instrumentation. This project commenced at the end of 2018 and is ongoing.

Recruitment drive in Cornwall

During 2018, we experienced a serious skills shortage for our workload programme in Cornwall requiring us to conduct our first-ever targeted social media recruitment drive.

The issue had arisen due to a higher workload in that area, coupled with an ever-increasing retirement profile in the Devon & Cornwall area and the fact that a significant number of employees had left us to take up higher paid contract work across the UK.

The combination of these factors led to around 100 industrial, operational supervisory and managerial vacancies.

This situation was unique to us and we therefore had to respond in a unique way. Our response consisted of the following:

- A bespoke social media campaign to drive applications which targeted the right types of people, in the right location.
- Total relocation of our recruitment team for a period and deployment of locally based temporary staff to make ourselves present and accessible in the local area.
- Specialist use of recruitment consultants for certain roles – eg field managers with gas specific qualifications, and local Job Centre Plus offices for others.
- Evening assessment centres to make it easier for potential recruits in current employment.
- Comprehensive induction packages held locally to the recruitment area.

Our approach proved to be very successful. The campaign ran for around six months and within this period we had filled the vacancies and demonstrated our ability to respond, assess and react to a workforce challenge in an agile and effective way.

This recruitment drive ran in parallel to similar concerns for our contract partners, who at the same time successfully targeted ex-military personnel for their organisation.

Chapter 19. Workforce resilience (continued)

– **Making the best of our workforce by upskilling and multi-skilling**. This is particularly important in rural areas where workloads are seasonal and we could deploy colleagues onto a broader range of work. In GD2, we will multi-skill colleagues in rural areas to better serve our local communities.

Our commitment

Deliver a Workforce Resilience Strategy to maintain and evolve the skills of our people to meet our customer needs now and in the future; including the ongoing investment in high-quality apprenticeships to levels 3 and 4.

Investing through supply chain/contractor models. Our full delivery model will be market tested during 2019/2020 to ensure best value, whilst retaining our focus on quality. Regardless of the model deployed, we will continue to make sure that all colleagues have the appropriate level of competence.

Continuing to implement a risk-based approach to succession planning, ensuring that key roles are highlighted and an individual's aspirations are known to ensure development is targeted in the right areas, from apprentice right through to senior/board level.

Adapting our succession planning horizon to at least 2036, as turnover increases and becomes more volatile due to the changing employment landscape and pension freedom legislation.

Developing our colleagues

Since our inception, we have maintained our skills profile by recruiting and upskilling in key areas.

Between 2005 and today, we have recruited 185 operational apprentices, helping to reduce our average age from 44 in 2005 to 40 in 2019. Our apprentice programme has a 90% retention rate and we're proud to have been awarded the Best Apprenticeship Scheme by CIPD Wales in 2017, and Highly Commended in 2018.

Of the 185 apprentices we've recruited, 13 of these have progressed to management roles within the business to date. This case study focuses on one of these individuals, Jamie Swain.

Jamie began as an apprentice in 2008. Two years later, he progressed to the role of First Call Operative – and by 2017 had landed a First Line Manager position. In 2019, Jamie was promoted into a Commercial Manager role within our Metering team and is mentoring one of our management trainees. He is now based in one of our operational depots and is responsible for the team delivering commercial metering contracts.

Jamie said, "This is a massive step away from the technical training I had as an apprentice, but it's given me such a good grounding in the engineering aspects of our operations, as well as a total focus on delivering great service."

He has been given the opportunity to develop within the role using our bespoke in-house management development and coaching programmes to structure his personal and professional development.

Jamie said, "I'm incredibly proud of my journey within Wales & West Utilities and of seeing so many former apprentices now operating as team leaders and managers. The focus on the combination of extensive technical, behavioural and customer service training really puts our apprentices in a great place to deliver for our customers and progress their own careers."

Creating a seamless colleague journey; from hire to retire.

Employee satisfaction and retention

Employee satisfaction is underpinned by our values and we are committed to transparent communications with colleagues and TU representatives. We have a comprehensive internal communication and engagement programme and our silver IiP accreditation demonstrates our commitment to good people practices and colleague engagement. Since 2013, we have worked hard to embed a values-led culture where colleagues care about each other and the communities we serve. We are in the process of developing an Employee Value Proposition as a strategy for attracting and retaining top performers.

We know that fatigue is becoming increasingly important and we are working with the HSE and other networks to address this issue. Although networks can be compliant with the Working Time Directive, colleagues can still be suffering from fatigue. Logically, GDNs will have to consider how they apply rest time to those due on standby and this could lead to a greater level of resource required to man existing work patterns and standby arrangements.

This is not just a work-related issue; external factors will also need to be considered. In a male dominated workforce, we need to consider the impact of a new child in the family or more complex health needs that may affect themselves or their partners – for example male and female menopause. To address this issue, we will work collaboratively with the other GDNs to look at existing arrangements and practices and conduct a study on the effects of various working arrangements on fatigue.

Chapter 19. Workforce resilience (continued)

It is entirely likely that any increase in working more than 12 hours in a shift will need to be backed up by robust scientific evidence. Options for commissioning this work are currently ongoing, but it is almost certain that in any event adjustments and increased resources will be the outcome, hence there may be a requirement to look at this further under the Uncertainty Mechanisms provided for within the GD2 process.

Contributing to our communities CVP

Making sure that our colleagues feel supported by WWU to make a positive contribution to their communities is really important to us and is part of our CVP. Colleagues are also actively encouraged to volunteer locally.

Via our matched funding policy, we provide financial support to a significant number of colleagues where their direct involvement working voluntarily with a charity, project or initiative benefits the local community. Monies donated or raised is matched by WWU up to £300 per employee per financial year, from a total fund allocated annually by the Board. Since 2007, we have match funded nearly £200,000.

We have a close relationship with Business in the Community Cymru, with our Director of Business Services sitting on the board acting as 'Community' lead and one of our senior managers in the leadership group which shares best practice and helps drive volunteering activities within communities.

We promote volunteering to our colleagues and via BITC. We deliver a minimum of 4 volunteering projects per year, working with schools or local community groups. We will normally supplement our labour and skills through the provision of materials for the projects and IT equipment, such as refurbished laptops. We are also involved in school projects, including Business Class, run by Careers Wales and are paired with a local school in a deprived area, offering support to the school through assisted reading, CVs and interview skills.

Our Directors and Senior Managers also sit on the boards or act as trustees to industry and third party organisations. They provide their huge experience and skills to help drive forward policy and initiatives. Examples include Care and Repair, Warm Wales, Highway and Utilities Committees, IGEM, BITC and others.

Evolving our company Ambition, Values and Priorities to better reflect our work, our people and our communities will allow us to maintain the wellbeing and resilience of our workforce. We have a strong track record of supporting colleague wellbeing though a comprehensive strategy, taking a 'whole person' approach – recognising the impact that our work and home lives can have on each other.

CVP The total valuation of our volunteering in communities in GD2 is £204k.

Our CVP is based upon the value of WWU volunteer time, plus our matched funding. We have also valued the wellbeing of our colleagues and communities who are involved in volunteering projects.

Reward and remuneration arrangements for GD2

Our recognition scheme is linked to our values and our reward strategy is linked to the achievements of specific targets. In GD2, we will closely align the objectives of our Executive and Management team to the delivery of the commitments and regulatory outputs that are set out in this plan. The performance objectives and associated remuneration of our Executive team and our senior managers have also been linked to the GD1 delivery of customer and regulatory outputs and are reviewed each year.

They vary in content, depending on role, remit and accountability. Colleagues are measured against any outputs that they are solely or jointly responsible for. Our pay structure for colleagues at these levels is based on 'personal contract terms' which are benchmarked both externally against similar roles and internally to look at accountability and contribution.

In GD2 we will use a very similar methodology and update performance objectives in light of business plan commitments. Each commitment will have at least one Executive and senior management owner and will be included in their objectives, reviewed twice a year.

Business plan commitment: pay and reward

Up to 50% of Executive annual bonuses will be related to the delivery of commitments. This will be role dependent with the remainder being made up of financial, people and personal development targets. For senior managers this will be replicated at a similar level.

Click **Appendix 19D** which outlines the governance of our pay and reward and sets out the Executive level ownership for each of the commitments in this plan.

Our GD2 commitments and activities

Committing to the real living wage and focusing on colleague wellbeing.

To address the challenges we face around engagement and retention, we commit to:

Maintaining our Investors in People accreditation. We've worked with IiP to benchmark our people practices since 2016, achieving a Silver level accreditation at our first attempt.

Continuing our focus on our values-based culture, maximising the benefits of our colleague engagement group, TU forums and Senior Manager Action Group – ensuring that internal stakeholders are engaged in decision making.

Developing an agile and flexible reward strategy which is aligned to regulatory outputs and meets the needs of existing and potential colleagues. We will pay more for high performers who add real value. To overcome existing or emerging areas of higher turnover, we will benchmark appropriately to make sure that our colleague offering remains competitive and appropriate.

Committing to the Real Living Wage. By signing up as a Real Living Wage Employer, we have made a clear commitment to fair pay and reward for our workforce and contractors, an important part of our sustainability strategy.

Continuing our focus on colleagues' physical and psychological wellbeing with ongoing investment in the priority areas outlined in our Wellbeing Strategy.

Chapter 19. Workforce resilience (continued)

Our Plan

We use historic trends and data to develop our annual recruitment plan An operational regional vacancy profile is then aggregated to form a 'total workforce' vacancy profile. The input assumptions that contribute are:

- the average retirement age of current employees;
- staff turnover is set at our current rate of 7%;
- future headcount is based on our regional workload forecasts.

Retirements

2.1% of the current workforce is older than their expected retirement age. Based on existing profiles, we assume the following retirement figures:

- By 2035/36, 535 employees are expected to have retired (36% of today's workforce).
- We expect 3% of employees to retire pre GD2.
- During GD2, 199 retirements are predicted (14%); in GD3, 116 retirements (8%) and in GD4, 166 retirements (11%).

Staff turnover

An annual staff turnover rate of 7% per year has been applied, based on latest data (and is assumed to remain the same through to 2036), resulting in around 107 vacancies per year.

Predicted vacancy profile

Given retirement and staff turnover assumptions, the total number of vacancies and their causes from now to GD4 is shown in figure 2 below.

The supply of recruits

We have developed a resourcing strategy to ensure that every predicted vacancy is filled quickly with an appropriately skilled person. To achieve this, we use three main entry routes:

- Trainees; eg Apprenticeships, Graduates
- Upskilling: All internal promotion is 'backfilled', meaning that the vacancy caused by someone moving upwards is also filled.
- External: Recruitment from any aspect of the external labour market (eg people moving from another employer/sector, the unemployed, ex-forces, etc).

These numbers relate to the number of new appointees in each year. As apprenticeships and graduates spend three years in training, these appointees are recruited ahead of actual demand. Also, each 'upskiller' is subsequently replaced (backfilled) with a new appointee – hence these recruitment numbers do not directly match those for the number of predicted vacancies presented. During GD2, this resourcing strategy would result in around 1,000 appointments being made.

Cost of our resourcing plan

The average cost per year is estimated to be £2.26m throughout GD2 and this is outlined by year in Appendix 19A along with the aggregated costs for each entry route for the years within GD2, GD3 and GD4 (+2 years) through to 2038.

Cost of recruitment

The estimated recruitment cost for an average role would be £320. We manage most recruitment in-house, making use of social media. For a senior role, on average it costs around 18% of their salary – based on agency/head hunter rates. Management time is estimated to be two days per vacancy; an average of £390 per vacancy.

Measuring workforce resilience

We propose the following high-level deliverables:

- IiP accreditation as a recognised measure of good people processes and development.
- An Exec-led annual people resilience statement guaranteeing our service, particularly in times of stress on the network (eg a 1 in 20 winter).

Click **Appendix 19E** for our people resilience statement.

Figure 1: Predicted number of new appointments (by entry route) during the next three price control periods

	GD2	GD3	GD4
Internal promotion – secondment	110	90	93
Internal promotion – permanent	243	208	224
Apprenticeships (three years' training)	65	65	65
Graduate Programmes (three years' training)	8	7	8
External appointment	603	534	571
External fixed term	41	37	50
Total	**1,070**	**941**	**1,011**

Figure 2: Predicted number of vacancies (by cause) during the next three price control periods

Cause of vacancies	GD2	GD3	GD4
Retirements	199	116	166
Staff turnover	536	535	530
Net changes to headcount	-20	-11	0
Total vacancies	**722 (49%)**	**643 (44%)**	**701 (48%)**

Chapter 20. Cyber resilience

We have taken the decision to omit our Cyber Resilience Plan from the business plan because the Ofgem NIS specific guidance was released on 13 September as a consultation to which we have responded, and is still in progress.

Due to the uncertain timelines on when Ofgem will issue any subsequent guidance, the costs for cyber resilience specific to NIS regulations are excluded from our submission and any costs will be subject to an uncertainty mechanism as referenced in Chapter 12 of our business plan.

In response to the NIS regulation, we have conducted a scoping exercise and risk assessment using the Cyber Assessment Framework (CAF) and submitted our improvement plan to Ofgem. As stated in the Ofgem business plan guidance, we understand that the omission of the Cyber Resilience plan will not lead to the business plan being considered incomplete for the purposes of the Business Plan Incentive.

Click **Chapter 12. Dealing with uncertainty** for further information. 104

Chapter 21. Business IT security plan

1. Highlights of our plan

- This chapter outlines how we plan to identify, prevent, detect, respond to, and recover from a cyber attack or data breach during GD2 and beyond.
- A robust risk management framework is key to identifying and managing efficient investment and risk reduction across our business. Cyber security is only one element of business resilience and we will take a holistic approach to ensure overall reliability.
- Recognising that some of the cyber threats may evolve over time, we will continue to assess the levels of risk and adapt our cyber resilience strategy accordingly. Our strategy will:
  - show how we plan to limit the severity and impact a cyber threat could have on our physical assets, the general public, our reputation, intellectual property and finances, ensuring we remain resilient;
  - cover both information and operational technology across our business;
  - set out the initiatives we have identified to reduce the risks to our network.
- Our first line of cyber defence is effective control and monitoring of our technology platforms, along with a robust risk management process.
- We are building a vigilant workforce that is empowered to identify and respond to suspicious activity whenever it is detected.
- We will adopt a 'zero-trust' stance when designing and building new IT solutions. This reflects the fact that our digital services of the future will run on both public and private networks, on 'trusted' and 'untrusted' devices, generating data from wholly-owned and private sites.

2. Introduction

In this increasingly complex environment, with the advent of new technologies, cloud services and mobile working, traditional security tactics are struggling to combat growing numbers of cyber threats; some of which are unknown and difficult to predict.

As a business that forms part of UK-critical national infrastructure and an operator of essential services to our 2.5 million customers across the network, it is crucial that we are able to maintain the confidentiality, integrity and availability of data and business operations in the event of a cyber attack, keeping the gas flowing for our customers.

We have a sophisticated network of physical and virtual technology with many points of potential attack. Nowadays, being secure and passive to cyber threats is not enough. Cyber attacks remain in the top 10 most likely and impactful global risks as identified by the World Economic Forum.

We know that it is no longer a matter of 'if' but 'when' we will suffer a cyber attack and so to ensure our resilience throughout GD2 and beyond, we have devised a strategy that assumes the worst and can manage the inevitable impact.

Our business security strategy not only addresses deliberate attacks, but also accidental failures of the technical infrastructure due to operator errors, equipment failures, and natural disasters – and also potential acts of disruption from inside the business.

61% of large businesses identified breaches or attacks in the last 12 months.

22,700 is the average (mean) annual cost for large businesses that lost data or assets after breaches.

22% lost files or network access.

13% System software corrupted or damaged.

12% Website impacted or taken down.

12 Typical (median) number of breaches identified.

Source: 2019 Official Gov.uk Statistics Cyber Security Breaches Survey.

This strategy will enable us to maintain a reliable supply for our customers, meet legal and regulatory requirements such as the Network and Information Systems Regulations (NISR) and the General Data Protection Regulation (GDPR), ultimately protecting our brand and reputation.

Our response to incidents has a direct impact on how much damage is caused. Whilst technology is important in this, to achieve true business security we need to adopt a holistic approach, bringing together cyber and physical security, along with organisational and operational needs.

We cannot afford to underestimate the role that colleagues play in our systems security and we need to leverage the skills of our people in order to improve our IT systems resilience.

We will educate our colleagues to be aware of social engineering and cyber threats so they recognise suspicious activity and can respond appropriately.

Our first line of defence is physical protection and our facilities and assets are subject to tight controls that prevent unauthorised use.

We will continue to assess physical risk along with cyber risk and develop an effective joint approach to minimising cyber attacks.

Click **Chapter 19: Workforce resilience** for further information. 181

Chapter 21. Business IT security plan (continued)

3. Cyber security in GD1

Controlling intellectual property and ensuring the cyber infrastructure is robust to stop cyber attacks.

In GD1, we have seen an increased cyber threat as attacks become more complex and our technology footprint continues to grow. We have added cyber-specific resources and event detection tools to our team's capability which has given us greater insight into our levels of security. This has provided us early visibility of suspicious behaviours and intrusion attempts that we see on a regular basis. In turn, this has allowed us to take preventative action and strengthen specific defensive controls, thus reducing our risk of successful cyber attacks.

Significant initiatives completed in GD1

- Penetration Testing – External ethical hackers were engaged to test our defences and determine where the weaknesses are so improvement action can be taken.
- Security Awareness Training – We enhanced user education and messaging to raise awareness of the threats and how to respond to them.
- Disaster Recovery Tests – These trials tested our ability to recover from a disastrous event should the worst happen.
- Enhanced Password Complexity – We deployed additional tools to ensure strong controls and policy review around passwords.
- Security Information & Event Management (SIEM) – Central logging and management of system events allowed us to identify suspicious and unusual activities.

Our SIEM monitoring and detection tool has already alerted and enabled us to react to a variety of attempts to take over control of user accounts and instances of phishing for account details and unapproved devices connected to the network.

4. Challenges to our cyber security

Improving infrastructure and delivering sustainable cities and communities with innovations such as IOT.

The global threat of cyber attack is growing, becoming more frequent and sophisticated, and we must take decisive action to protect our network and stakeholders. We have seen in recent years how disruptive and costly simple and indiscriminate attacks can be on public services such as the NHS in the case of the WannaCry outbreak. We remained unaffected by this, but should a similar outbreak target our network, we could see widescale disruption to supply, and significant financial and potential human impact. The cost of operational resource to purge and relight a large community after a disruption to supply would be significant.

WORLD ECONOMIC FORUM

Source World Economic Forum Global Risks Report 2019 identified the risk of cyber attacks as:

- 5th most likely
- 7th most impactful versus other business risks

NHS

£92m is the estimated total direct cost of lost output and IT support as a result of WannaCry. Source: Department of Health

There are a number of specific challenges we face which we will address in order to maintain resilient systems:

- Cyber awareness needs to be front of mind across the whole workforce. Every single colleague has to take full ownership and work in conjunction with our IT department to fight the threat.
- As acknowledged in our Workforce resilience chapter, we have challenges in recruiting and retaining IT specialists with cyber skills which are compounded by regional variations.
- With cloud software, mobile workforce and personal devices being used to access company resources, the perimeter of an organisation is harder to define and therefore protect, so we will build security in at an application level.
- The opportunity to exploit data is increasing due to increasing volumes of information in circulation and lower connectivity costs. Whilst Artificial Intelligence (AI) and automated processes will lead to a more seamless, open marketplace with improved forecasting and control systems, the smarter network is also more vulnerable to manipulation by outsiders. We will need to make sure the appropriate controls are in place to combat this threat.
- Low cost "smart" domestic energy controls (Internet of Things (IOT) device) and voice activated personal assistants all present a target for hackers and a threat of wide-scale fluctuations in energy demand beyond our control if compromised. Industrial sites, both consumers and producers with their own technology beyond our control are also susceptible to cyber attack, but we must ensure we are able to sustain operational control despite these potential events.
- The potential impact is changing as the role of the gas network changes. The consequence of failure is increasing from just an impact on heat, to one that would affect power generation and all forms of transport. We will take this into consideration as we identify threat and risk profiles for cyber treatment plans.
- Whilst we continue to segregate and protect the core control environments, we will see an increase in flexible back-office working, with a more transient workforce and stakeholder groups connecting to our technology services, from devices that we don't own and locations we don't trust.
- As we connect additional sources of bio-gas to our network, we are expanding the footprint of telemetry and control systems. These sites and the control systems that manage them are not owned or operated by WWU, making it difficult to enforce our cyber standards on smaller suppliers.
- Global motivation to cause disruption to UK PLC remains high. We must be vigilant to maintain the highest of standards for our employees and customers.
- Our industry is sizeable with a diverse supply chain. With over 50 regular suppliers of IT services, plus our subcontractors of subcontractors in the Electrical & Instrumentation area, it is hard to gain visibility of all resources operating on the network. We will need to be able to better scrutinise and verify the organisations with which we do business.

Chapter 21. Business IT security plan (continued)

– The utility industry has typically relied on a contractor workforce to deliver IT specialist capability, limiting the amount of in-house knowledge. This will need to develop in the future to an in-house model to build skill levels, retain knowledge and guarantee a rapid response.

5. Customer and stakeholder engagement

Engagement informing our commitments

Increase our focus on preventing and detecting cyber-attacks – investing a further £7m in our technology platforms in GD2 to reduce the increasing risk.

We have shared our plan with customer engagement groups and industry experts, soliciting views and feedback from a wide group of over 2,000 stakeholders.

Whilst the plan has been broadly accepted as positive, there have been some challenges on costs.

Our investment of £6.8m in IT business security represents 7.7% of overall IT spend, and is slightly above the average of 6.8%, identified by one industry expert. We also understand from our acceptability testing that two thirds of customers would not want to pay more on their bills for cyber security.

It is necessary to point out that our cost is an average over a 5-year period beginning in 2021, during which time we anticipate threats becoming more complex, thus increasing average cyber spend for all organisations.

The CEG challenged our plan, commenting that it failed to fully identify risks and solutions. We have discussed our cyber resilience plans, noting the sensitivity of publishing too much detail. We have also assessed our levels of risks and potential mitigating investment against Ofgem's guidance (as it is the Competent Authority) and are proposing an uncertainty mechanism to deal with this during GD2. We will reassure our stakeholders by conducting threat analysis and risk modelling that informs the areas in which we will make investments, as identified in our roadmap.

In response to all the feedback, we are committed to investing £7m in cyber security during GD2, given our obligations to protect the public and our assets, and the high importance that customers place on safety and reliability. Our cyber investment will ensure that we remain resilient, keeping customers safe and warm.

Click **Appendices 5F** for further information on our engagement.

6. Our cyber resilience strategy

The continual shifting profile of cyber risk demands a flexible approach in GD2. Our plan is based on risks we have already identified, but this will change over time. Therefore, we have developed a robust strategy that will enable us to continuously maintain a cyber resilient business faced with a variety of unknown challenges. If the threat or risk profile changes significantly due to unforeseen circumstances such as economic conditions, regulatory changes, or technology advances, it may be necessary to re-open the plan accordingly. As an example, we have not yet included any costs as a direct result of NIS improvements – this will be subject to an reopener mechanism.

Click **Chapter 12: Dealing with Uncertainty** for further information. 104

Our objective is to increase the difficulty for anyone to mount an attack and to prevent impact to our network from any known risk. Effective risk management is therefore at the heart of our strategy.

We also need to meet many security standards from various regulatory or financial frameworks, and these broadly align to the areas of focus shown above: Identify, Protect, Detect, Respond and Recover.

All planned activities for GD2 (see below) are aligned with one of these five elements. We will also align our operations and values to five security principles:

1. **Ownership and Governance**
   We will regularly review and maintain policies and standards for cyber resilience.

   Our Executive team regularly reviews key business risks and performance through the Business Operating Committee. In support of this, key risks are shared and discussed with the Board through the Audit and Risk committee. IT and cyber is specifically owned by the Director of Business Services.

   We have a culture that empowers our senior managers to act and deliver for their areas of responsibility. We have a skilled and experienced IT team that works extensively with all parts of the business. As part of our normal business operation, we have a well-established emergency response process that is regularly tested.
2. **Security by design**
   Security and resilience are critical requirements considered at the design stage of any system or solution.
3. **Managing digital risk**
   Security investments will be informed by risk management processes and engagement at Board level.
4. **Security awareness**
   We will continuously educate and raise awareness with our workforce on how to behave safely online.
5. **Industry collaboration**
   We will share and communicate with industry peer groups regarding threat intelligence and best practice.

Chapter 21. Business IT security plan (continued)

7. Summary of our GD2 outputs

IT security outputs — Click **Appendix 3A** for further justification on these outputs

Measure and type	Explanation	Proposal/target	Stakeholder views	2018/19 performance	Comparative performance	Other requirements	Customer benefits
Common output measures with a bespoke target							
Cyber resilience PCD	As a key utility infrastructure provider, we are at risk from a cyber attack that could impact supplies to homes and businesses. We therefore need to ensure appropriate levels of cyber resilience.	Investing a further £7m in our technology platforms in GD2 to reduce the increasing risk.	This issue is widely recognised as an increasing threat to businesses and national infrastructure. Our engagement on this issue supported our commitment.	No performance data is available from 2018/19 as the NIS regulations did not exist in GD1.	There is no benchmarking data available other than NGN and Cadent, and we have undertaken joint work on costs with both.	Our plan will improve our cyber controls maturity to an enhanced level of protection against a sophisticated cyber security threat.	Our work in this area will protect our critical control systems and critical business processes against an NIS threshold event – delivering a secure and reliable gas supply by reducing the risk of a cyber security attack.

8. Our GD2 commitments

- In GD2, we will deliver enhancements to our cyber resilience capability at a total cost of £6.9m.
- We will continue to use our cyber risk management framework to meet the needs of industry standards such as ISO27001, NIS and GDPR.
- Our IT teams will move to an operating model of direct IT employees providing core delivery capability, supported by partners.
- We commit to an evolving and agile cyber resilience strategy that is able to adapt and respond to changing external factors (such as the evolving national or international threats status to UK utilities).
- In GD2, we will increase our investment in SIEM.
- We will implement the security initiatives identified in our roadmap below, to address the risks in our environment.

Our commitment

Increase our focus on preventing and detecting cyber-attacks – investing a further £7m in our technology platforms in GD2 to reduce the increasing risk.

9. Our GD2 planned activities

Working with others will assist us in ensuring our IT infrastructure is robust and secure.

We will deliver the aforementioned commitments via the following activities, aligned with our cyber resilience strategy:

Identify

We will consolidate our risk management framework to allow us to get a senior group level and more holistic view of the risks we face to our business resilience. This will allow better insight, prioritisation and reduction of risk.

Prevent

- The transformation of our platforms to modern integrated solutions will allow us to establish more efficient and resilient ways of working. We will standardise common components so that they can be maintained to current versions and patch levels more efficiently.
- We will deliver continuous and tailored training programmes to increase cyber awareness and continue to participate in collaborative learning events to make sure that we are fully informed and ready to react in the event of an attack.
- We will move our capital assets to more secure and resilient public cloud services rather than using private data centres. We will design our solutions with data protection and availability in mind.
- In GD1, we introduced end-to-end encryption of our Supervisory Control and Data Acquisition (SCADA) communications to control sites. In GD2, we will strengthen our cryptography ciphers and widen the scope of encryption to other areas of communication, such as our back-office network and encryption of email.
- In GD1, we used third party specialists to conduct annual testing of our security defences, but in GD2 we will enhance this with a more frequent cycle of testing. We will improve the way we manage and respond to critical vulnerabilities through automation of the testing and by developing an in-house analysis and response capability.

Chapter 21. Business IT security plan (continued)

Detect

- In GD1, we were able to detect and quarantine known viruses using anti-virus products. In GD2, we will upgrade to a new generation of anti-virus products that are able to anticipate and identify malicious software quicker.
- In GD2, we will expand our SIEM platform to include more control system events from our operational technology systems. This will allow us to extend our cyber detection into control operations, in addition to the back office information technology systems.
- Adopting new cloud services will give us access to information protection and data loss prevention techniques. This will allow us to detect and prevent the sharing of personal or sensitive data outside of our organisation.

Respond

- We believe it is necessary to build a capable and reactive security team in-house to ensure that our technology tools, preventative measures and detection systems are effective and we can respond to any threat.
- We will promote more integration between our OT (Operational Technology) and IT (Information Technology) teams upskilling the engineers in each for a greater understanding of the holistic threat.
- We will work proactively alongside relevant security incident management organisations to ensure we are prepared for a significant incident.
- We will work with our local universities to develop and encourage skills in our area, ensuring a long-term sustainable flow of skilled cyber engineers.
- In the event of a breach we have developed a comprehensive incident response plan in which communication channels with our board, regulators and stakeholders are established.

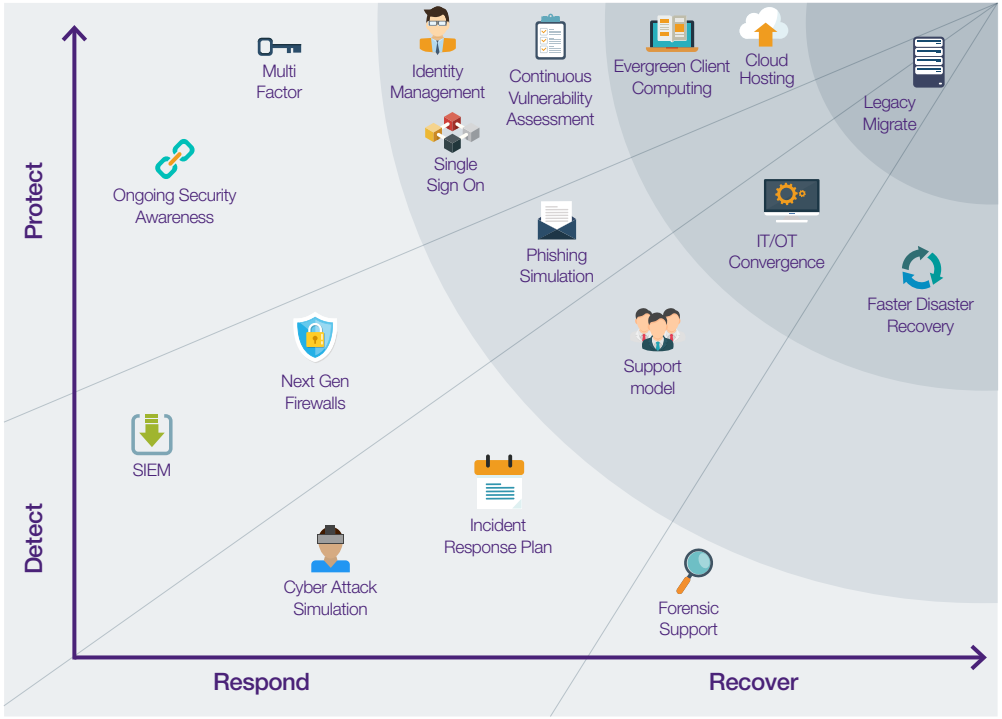
Recover

- In GD1, we defined and tested our ability to recover from a catastrophic event through regular business continuity and disaster recovery planning and testing exercises. As our reliance on technology increases in GD2, we will leverage cloud technology to improve our recovery times and reflect the increasing expectations of our stakeholders should a disruptive attack occur.

We will work with our local universities to develop and encourage skills in our area, ensuring a long-term sustainable flow of skilled cyber engineers.

10. Our cyber security roadmap

These initiatives will provide a solid foundation for managing cyber risk into GD2 and beyond. As the threat and the need for a fast response increases, so does the requirement for investment in cyber skills. Cyber security must become routine in the daily operation of a critical business such as ours and so establishing a team to combat the threat is essential.



11. Costs

► Cyber security expenditure

£m 2018/19 prices	2021/22	2022/23	2023/24	2024/25	2025/26
Cyber resilience capex	0.60	0.50	0.51	0.41	0.51
Cyber resilience opex	0.89	0.87	0.88	0.86	0.89
Cyber resilience totex	1.49	1.38	1.39	1.27	1.40

F

Financeability

This section contains summary financeability information.

Click **Appendix 22A** and **Appendix 22B** for detailed financeability papers.

In this section:

22. Financeability
Summary of financeability information. 195

Chapter 22. Financeability

1. Highlights

Our achievements during GD1 and prudence from our owners have allowed us to sustain a sector-leading investment grade rating position through GD1 to date. We are determined to continue to keep customer bills as low as possible, with an efficient, financeable business, fully invested and with no output deficiencies.

2. Business plan submissions

Ofgem requires a financeability assessment of the Notional Company structure basis (we refer to this as the "Ofgem Notional Company") and the Actual Company structure basis (we refer to this as the "Ofgem Actual Company").

The key difference between these two plan versions relates to the cost of debt capital.

The Ofgem Notional Company applies Ofgem's assumed allowed revenue for cost of debt of an average 1.93% p.a. (real,CPIH). Its actual cost of debt is assumed to be funded by this rate.

The Ofgem Actual Company uses Ofgem's assumed revenue for cost of debt of 1.93% (real, CPIH) and WWU's cost of debt of 5.25% (real, CPIH), before assumed mitigating actions (4.70% after assumed mitigating actions).

We summarise our position on these two plans as follows:

Ofgem Notional Company

- The Notional Company should be financeable in GD2, with a rating of BBB flat to BBB+, against a target rating of BBB+. However, we have reservations and concerns about this Company's financeability, over a longer timeframe, which can only be resolved through higher allowed revenues for cost of capital.
- Ofgem's assumed allowed revenue for cost of capital is 3.08% (real CPIH), based on an average 1.93% for cost of debt and 4.8% for cost of equity at a 60% notional leverage, and the assumed actual cost of capital is this rate of 3.08%.
- Average annual domestic customer bills should be 13.4% less (2018/19 prices) than the average of WWU's bill for GD1.
- Shareholder cash returns 3% (real, CPIH) of equity RAV, which is Ofgem's working assumed rate.

Click **Appendix 22A, section 7** for further information.

Ofgem Actual Company

- The Ofgem Actual Company would not be financeable against a target rating equivalent to WWU's current debt ratings of A- for Class A debt, BBB for Class B debt and an Issuer Default Rating (IDR) of BBB. The main cause can be simply stated – Ofgem's assumed revenue for cost of capital of 3.08% (real, CPIH) is too low to cover WWU's efficient cost of capital.
- This plan version uses Ofgem's assumed allowed revenue for cost of capital of 3.08% (real, CPIH), based on an average 1.93% for cost of debt and 4.80% for cost of equity at a 60% notional leverage. It uses WWU's efficient actual cost of debt of 5.25% (real, CPIH) before assumed mitigating actions (4.70% after assumed mitigating actions) and 60% notional leverage. The difference in annual revenues between the assumed allowance for cost of debt of an average 1.93% and the actual cost of debt of 5.25% is £50m p.a. or £42m after assumed mitigating actions.
- Due to mitigating measures by WWU already undertaken in GD1 to support GD2, assumed further mitigating measures for GD2, and also due to £137m of revenues advanced into GD2 by Ofgem moving from RPI to CPIH at the expense of future control periods, we conclude that it should maintain a rating of BBB- and be compliant with senior lender ratios, albeit with very limited headroom. However ratings would be weakened from current levels; for Class A debt from A- to BBB+ negative outlook and Class B debt from BBB flat to BBB- negative outlook.
- Average annual domestic customer bills would be 14.5% less (2018/19 prices) than the average of WWU's bill for GD1.
- Shareholder cash returns to be nil, as one of the assumed mitigating measures.

Click **Appendix 22A, section 8** for further information.

3. WWU business plan

Ofgem has confirmed it will allow companies to apply different assumptions for allowed revenues for cost of capital. As required by Ofgem, plans prepared on this basis must be contained in a separate document (**Appendix 22B**). We make reference to this plan (the "WWU business plan") here for comparison with the above two plan versions required by Ofgem as we believe stakeholders, in particular our investors, will be interested.

WWU business plan

- Our business plan should be financeable, with continuation of our sector leading ratings with Fitch and S&P of A- for Class A debt and BBB for class B debt.
- It includes an allowed cost of capital of 5.59% (real, CPIH), based on equity of 6.10%, debt of 5.25% and notional leverage of 60%. Supporting evidence and justification has been provided to Ofgem.
- Average annual domestic customer bills to remain flat at £133 (2018/19 prices) with GD1.
- Shareholder cash returns average 2.5% pa (real, CPIH) based on Equity RAV, less than Ofgem's assumed distribution rate for its Notional Company of 3.0%

Click **Appendix 22B** for further information.

4. Customer engagement

We held a deep dive workshop on value for money, including financial risk, which was attended by two different age groups of customers (the under and over 45s).

Understanding was limited given the complexity of the topic, with most customers not realising that utility businesses such as WWU need debt to support investment.

However, while noting this was a complex area, the over 45s had a broader understanding of the role of Shareholders, including the cost of debt funding. The under 45s were pleased that Shareholders have been helping by paying for this, and were keen to see what the Company could do to reduce debt costs further.

Chapter 22. Financeability (continued)

Whilst customers did not fully understand the need to fund the cost of debt through bills, they did express concern about our long-term sustainability and were also concerned that if the cost of debt were not funded, our continuing operation may not be feasible.

Our willingness to pay research concluded that maintaining customer bills at £133 (2018/19 prices) is the second most important priority for our customers after safety; the WWU business plan delivers against this commitment with average bills in GD2 at £133 (2018/19 prices).

5. Ofgem Actual Company – further comments

As noted in section 2, the Ofgem Actual Company plan would not be financeable. This is mainly because, notwithstanding actual and assumed significant mitigating measures by WWU being included, none of which increase customer bills, the revenues assumed by Ofgem for the cost of capital would be too low to cover the efficient capital costs of WWU. This is even with the benefit of revenue acceleration from future control periods into GD2 of £137m from Ofgem's switch from RPI to CPIH from April 2021. We have noted in section 2 that the underlying shortfall in revenue for cost of debt would be £50m p.a. excluding assumed mitigating measures, and £42m p.a. including such measures.

Mainly due to our mitigating measures already taken and assumed, the licence requirement of a minimum issuer credit rating of BBB- should be maintained and senior lender ratios thresholds should be achieved during GD2.

However, we note:

- there is limited headroom under certain senior lender interest ratios;
- net cash flows are materially negative;
- there would be a one notch downgrade by Fitch and S&P to the debt ratings from A- to BBB+ for Class A debt and from BBB flat to BBB- for Class B debt; and these levels would be placed on negative outlook;
- there would be a one notch downgrade by Fitch to the IDR of BBB flat to BBB-, and placed on negative outlook;
- equity financeability is undermined – we apply an assumption of nil payments to shareholders as one significant measure to aid financeability, and there is no likelihood of any material cash returns to shareholders beyond GD2 if the Ofgem assumed revenues for cost of capital were to continue;
- the above profile depends on a significant acceleration of revenues into GD2 from future control periods consequent upon Ofgem's decision to move to CPIH from RPI.

As requested by Ofgem, we have considered a range of potential mitigating measures to aid financeability, and as noted, a number of these are included in this plan version. We have also given consideration to measures to accelerate further revenues into GD2 from future control periods (ie measures indicated by Ofgem) but concluded that these are not appropriate, as they:

- increase customer bills;
- have limited impact in GD2 on interest cover ratios;
- do not improve long term financeability;
- do not meet Ofgem's requirement for justification for shorter asset lives or for resetting the fast/slow totex split.

WWU's totex and cost of capital, included within this Ofgem Actual Company plan version, are at efficient levels. Consequently, Ofgem's proposed assumptions for cost of capital revenue allowances result in a financial profile that is not a comfortable investment grade, despite assumed nil payments to Shareholders and other assumed mitigating measures.

CMA precedent requires a regulator to exercise caution against setting the cost of capital too low in the context of financeability. Therefore Ofgem should reconsider its assumed revenues for cost of capital in that context, at least. We also ask that Ofgem's independent RIIO-2 Challenge Group reflects carefully on this matter and demonstrates its independence and objectivity by challenging Ofgem, given the expert evidence supporting a much higher revenue allowance for cost of capital.

We disagree with Ofgem's stance on its statutory duty of financeability. Within our response[1] to the questions on financeability in Ofgem's December 2018 sector consultation, we made the following points:

"… financeability, of all things, must be assessed against the particular circumstances of each company and cannot be considered on the basis of a purely notional company.

The financing duty is concerned with the need to secure that licence holders can finance the activities which are the subject of obligations placed on them. It applies in respect of all actual companies who hold licences, and not in respect of a notional company. For this purpose, Ofgem must take companies as it finds them.

The duty cannot be satisfied by providing only for the financeability of a notional company if this does not reflect the real-world circumstances of one or more licence holders."

and,

"In any event, however Ofgem's financing duty may be interpreted, it cannot be a proper discharge of that duty to 'put the onus on companies to take appropriate action'. By definition, the duty must place obligations on Ofgem itself. These cannot be delegated to the very companies who are the intended beneficiaries of the statutory duty. Placing the onus on companies is the avoidance of responsibility, and not its fulfilment."[2]

To conclude, and after detailed consideration by WWU of potential measures to aid financeability for this Ofgem Actual Company plan version required by Ofgem, resulting in assumed adoption of certain significant measures for GD2 in addition to a series of measures taken already in GD1 (both as set out in section 5 and 8 of **Appendix 22A**), the Ofgem Actual Company would not be financeable. Ofgem's assumed allowance for cost of capital is too low. This conclusion assumes, inter alia, that Ofgem decides that it will not take any measures to make the Ofgem Actual Company financeable.

1 Page 79 of the WWU response to Ofgem on 14 March 2019.

2 Ibid, page 78.

Chapter 22. Financeability (continued)

Conclusion

A financeability assessment acts as a check to ensure that regulatory decisions for a price control provide for a financeable business. Where the results are negative, this may indicate a need for action by the Company to improve the position. But it may also indicate that the regulator's decisions are incapable of providing for a financeable business and are therefore inconsistent with its statutory duties.

In GD1 to date, WWU has made significant progress on many fronts and has delivered consistently strong operating performance, achieving all required outputs efficiently, including regulatory and HSE. This is despite incurring the significant burden of WWU being denied a fair allowance for its efficiently incurring debt financing costs in GD1. Shareholders have demonstrated restraint and supported measures to strengthen financeability, including lower cash distributions and significant early debt redemption to reduce financing risk in GD2[3]. We approach GD2 with a fully invested, efficient business and capital structure, and strong focus on minimising customer bills.

We have concluded that the WWU business plan should be financeable with average customer bills (2018/19 prices) flat compared with GD1. In reaching this conclusion, our assumed revenues for cost of capital are based on independent evidence.[4]

We have concluded that Ofgem's Notional Company should be financeable with a rating range of BBB to BBB+, although with reservations about its longer-term financeability. That plan version shows a 13.4% reduction to customer bills over WWU's annual average projected charge for GD1. This conclusion on the Notional Company is without prejudice to our evidence based position on allowed revenues for cost of capital.

However, for the Ofgem Actual Company, we have concluded that it would not be financeable unless Ofgem takes measures in discharge of its statutory finance duty to enable financeability to be achieved. This conclusion is despite measures already taken by WWU in GD1 to support GD2, and assumed further measures by WWU to aid financeability in GD2, including nil payments to Shareholders. It is also despite an efficient level of expenditure for the business and its capital structure.

Further, we note that Ofgem's assumed revenues for cost of capital are significantly below independent and evidenced based reports. Ofgem's assumed allowed revenue of 3.08% (real, CPIH) for cost of capital is too low. This plan version shows a 14.5% reduction to customer bills over WWU's annual average projected for GD1.

An adequate allowance for cost of capital provides financial capacity to sustain investment and efficiencies, absorb risks, and critically, maintain confidence with debt and equity investors. Ofgem's proposed working assumptions for cost of capital revenue allowances would not enable that financial capacity to be achieved and would be inconsistent with the CMA's stated caution against setting cost of capital too low in the context of the regulator's financing duty.[5]

With assumed nil payments to Shareholders over GD2 (and no prospect of payments thereafter if the assumed WACC revenue allowances continue) and average annual customer bills showing a 14.5% reduction over GD1, Ofgem would not achieve an appropriate balance between these stakeholders in the case of the Ofgem Actual Company. Further, Ofgem's WACC assumptions would conflict with one of six principles of economic regulation promulgated by UK Government in 2011.[6]

We remain deeply concerned about Ofgem's positioning for GD2. Our confidence level critically hinges on our expectation, shared by many others, of a stable, predictable and supportive regulatory regime that achieves a fair balance of risk and reward between stakeholders. However, we are far from a position whereby we could confirm to our investors that Ofgem's positioning for GD2 should achieve that fair balance.

We are very concerned that it may be just a matter of time before emerging concerns amongst rating agencies will intensify; transmitting nervousness into investors and higher capital costs in to the market for regulated energy networks. This would not be in the interests of our customers.

3 See Section 5.2 (Finance **Appendix 22A**) for details of steps already taken to support financeability in GD1.
4 Independent expert reports outlined in Section 10 to the Finance **Appendix 22A**.
5 CMA Bristol Water Case 6 October 2015, Para 10.151(a).
6 Principles for Economic Regulation, Department of Business Innovation and Skills April 2011. The economic principle of Predictability: "(i) the framework for economic regulation should provide a stable and objective environment enabling all those affected to anticipate the context for future decisions and to make long term investment decisions with confidence (ii) the framework of economic regulation should not unreasonably unravel past decisions, and should allow efficient and necessary investments to receive a reasonable return, subject to the normal risks inherent in markets." We also refer to Section 4AA(5A)(b) Gas Act 1986; and for the importance the CMA attaches to regulatory predictability: Phoenix Natural Gas Case, paras 9.112 to 9.120 and section 8.

Appendices

All Appendices are hyperlinked throughout the plan and in the table below.

A Summary of our plan

1 Executive summary
- 1A Index of Ofgem minimum requirements
- 1B Navigating our business plan and Data Tables
- 1C Business plan Change Log
- 1D Collaboration endorsement letters
- 1E RIIO-2 Challenge Group feedback response
- 1F Board assurance on Business Plan ambition
- 1G KPMG assurance on business plan accuracy
- 1H Oxera assurance business plan efficiency
- 1I UN Sustainable Development Goals methodology

2 Our consumer value proposition
- 2A Consumer value proposition summary
- 2B CVP Independent substantiation
- 2C1-2C22 CVP supporting appendices

3 Outputs and incentives
- 3A Outputs and commitments justification

B Meeting the needs of consumers and network users

5 Giving consumers and stakeholders a stronger voice
- 5A Stakeholder engagement – our journey and lessons learnt
- 5B Detailed stakeholder segmentation
- 5C Stakeholder engagement strategy
- 5D Pre-GD2 engagement plan
- 5E Triangulation feedback summary
- 5F Synthesis reports on outputs, commitments and environment
- 5G Customer personas
- 5H Stakeholder views – conflicts
- 5I Summary of CEG challenges
- 5J CEG Governance
- 5K AA1000 SES rating

6 Customer service
- 6A Customer service strategy
- 6B Case study: Customer support officers

7 Social obligations
- 7A Our Consumer vulnerability strategy
- 7B Mapping to Ofgem's Vulnerability Strategy 2025
- 7C Measuring benefits methodology (SROI)
- 7D WWU Partnership selection tool
- 7E Case study – healthy homes healthy people

8 Customer bills
- 8A Customer bills additional information

C Delivering value for money

9 Cost efficiency
- 9A Loss of metering impact
- 9B GD1 one-off cost benefits
- 9C Cost efficiency benchmarking consultant report
- 9D GD1 mains replacement performance
- 9E Unit cost and back office analysis
- 9F Productivity growth – consultant report for WWU
- 9G Productivity growth – joint GDN consultant report
- 9H RPEs consultant report
- 9I Finance independent benchmarking consultant report
- 9J People & engagement independent benchmarking consultant report
- 9K Office & depot property portfolio independent benchmarking consultant report
- 9L IT independent benchmarking consultant report
- 9M Regional factors consultant report for WWU
- 9N Pensions engagement consultant report
- 9O Pensions evaluation consultant report
- 9P Business plan to data table (BPDT) mapping

10 Using competition to deliver best value
- 10A Native Competition Plan for GD2

11 Our innovation strategy
- 11A GD1 innovation track record
- 11B SME insight report
- 11C Project inspire summary report
- 11D SMART funded review of WWU innovation process
- 11E GD2 innovation benefits measurement
- 11F GD1 innovation project list with benefits mapping

D Delivering an environmentally sustainable network

13 Our net zero ready vision for 2035
- 13A Our strategic approach to the future of energy challenge
- 13B The wider decarbonisation debate
- 13C Net zero consumer value proposition
- 13D Our future of energy research
- 13E Local Area Energy Plans
- 13F Whole system work
- 13G Smart hybrid heating systems
- 13H A consistent view of the future
- 13I Enabling renewable generation
- 13J Biogases
- 13K Transport
- 13L Heat networks and CHP
- 13M Hydrogen
- 13N System operability
- 13O Decarbonising industry

14 Environmental Action Plan
- 14A Environmental Action Plan (Full version)

E Maintaining a safe, resilient network

15 Asset resilience
- 15A Table of our CBAs and EJDs
- 15A1-15A7 Cost Benefit Analysis
- 15B1-15B7 Engineering justification documents
- 15C Investment against FES scenarios
- 15D Digitalisation strategy

16 Distribution
- 16A GD2 Mains replacement programme: response to RIIO-2 CG Deep Dive questions
- 16B GD2 mains insertion rate forecast: response to RIIO-2 CG Deep Dive questions
- 16C MOB record keeping

17 Connecting homes and businesses
- 17A English and Welsh housing projections
- 17B Future homes standard: WWU sensitivity analysis

18 Transmission and pressure management
- 18A Pipeline integrity studies

19 Workforce resilience
- 19A EU skills paper on headcount requirements through to 2036 – WWU
- 19B EU skills paper on headcount requirements through to 2036 – all GDN
- 19C Diversity strategy
- 19D Business plan commitment: pay and reward
- 19E People Resilience Statement

F Financeability

22 Financeability
- 22A Finance Annex 1: Ofgem Notional and Ofgem Actual company
- 22A1-22A6 Finance supplementary reports
- 22B Finance Annex 2: WWU business plan
- 22C Rothschild & Co letter

Glossary

AD
Anaerobic Digestion

AI
Artificial Intelligence

AIM
Asset Investment Manager

BAME
Black, Asian, and Minority Ethnic

BAU
Business as usual

BEIS
Department for Business, Energy, and Industrial Strategy

BPDT
Business Plan Data Tables

Capex
Capital Expenditure

CBRM
Condition Based Risk Modelling

CEG
Customer Engagement Group

CFP
Critical Friends Panel

CHAID
Chi-square Automatic Interaction Detector

CHP
Combined Heat and Power

CMG
Compressed Methane Gas

CNG
Compressed Natural Gas

CNI
Critical National Infrastructure

CO
Carbon Monoxide

COMAH
Control of Major Accident Hazards

CPI
Consumer Price Index

CSV
Composite Scale Variable

CTSA
Counter Terrorism Security Agency

CVP
Consumer Value Proposition

CVs
Calorific values

DNOs
Distribution Network Operator

DRS
Discretionary Reward Scheme

ENA
Energy Network Association

EU Skills
Energy & Utility Skills

EVs
Electric Vehicles

FCO
First Call Operative

FES
Future Energy Scenarios

FPNES
Fuel Poor Network Extension Scheme

GD1
Gas Distribution Price Control 2013-2021

GD2
Gas Distribution Price Control 2021-2026

GDN
Gas Distribution Network
EoE = East of England (Cadent)
Lon = London (Cadent)
NW = North West (Cadent)
WM = West Midlands (Cadent)
NGN = Northern Gas Networks
SC = Scotland (SGN)
SO = Southern (SGN)
WWU = Wales & West Utilities

GDPCR1
Gas Distribution Price Control 2009-2013

GDPR
General Data Protection Regulation

GSR
The Gas Safety (Installation and Use) Regulations 1998

GSMR
Gas Safety (Management) Regulations 1996

GSoP
Guaranteed Standards of Performance

GwH
Gigawatt Hour

HAUC
Highway Authorities and Utilities Committee

HSE
Health and Safety Executive

HSE
Health, Safety and Environment. WWU directorate

ICS
Institute of Customer Service

IGEM
Institution of Gas Engineers and Managers

IiP
Investors in People

ILI
In-Line Inspection

IWA
Institute of Welsh Affairs

kWh
Kilowatt Hours

LDZ
Local Distribution Zone

LO
Licence Obligation

LTS
Local Transmission System

MEAV
Modern Equivalent Asset Value

MOBs
Multi Occupancy Buildings

MPRS
Meter Point Registration Service

MwH
Megawatt Hour

NARM
Network Asset Resilience Measure

NIA
Network Innovation Allowance

NIS
Network and Information Systems

NOM
Network Output Measure

NRSWA
New Road and Street Works Act

NRSWA Diversion Code of Practice
HAUC measures necessary where apparatus is affected by major works

NTS
National Transmission System

ODI
Outcome Delivery Incentive

OLS
Ordinary Least Squares

Opex
Operating Expenditure

PCD
Price Control Deliverable

PE
Polyethylene

PRE
Public Reported Escape

PRI
Pressure Regulator Installation

PSR
Priority Services Register

PSUP
Physical Security Upgrade Programme

Repex
Replacement Expenditure

RHI
Renewable Heat Incentive

RIIO
Revenue = Incentives + Innovation + Outputs

RoRE
Return on Regulated Equity

ROSPA
Royal Society for the Prevention of Accidents

RPEs
Real Price Effects

RPI
Retail Price Index

RRP
Regulatory Reporting Pack; Annual Reporting to Ofgem

SEIS
Stakeholder Engagement Incentive Submission

SIEM
Security Information and Event Management

SMEs
Small and medium enterprises

SROI
Social Return on Investment

Syngas
Synthesis gas

TFP
Total Factor Productivity

Totex
Total Expenditure

UKERC
UK Energy Research Centre

UN SDGs
United Nations Sustainable Development Goals

Wales & West House
Spooner Close, Celtic Springs
Coedkernew
Newport, NP10 8FZ
www.wwutilities.co.uk

WALES&WEST UTILITIES