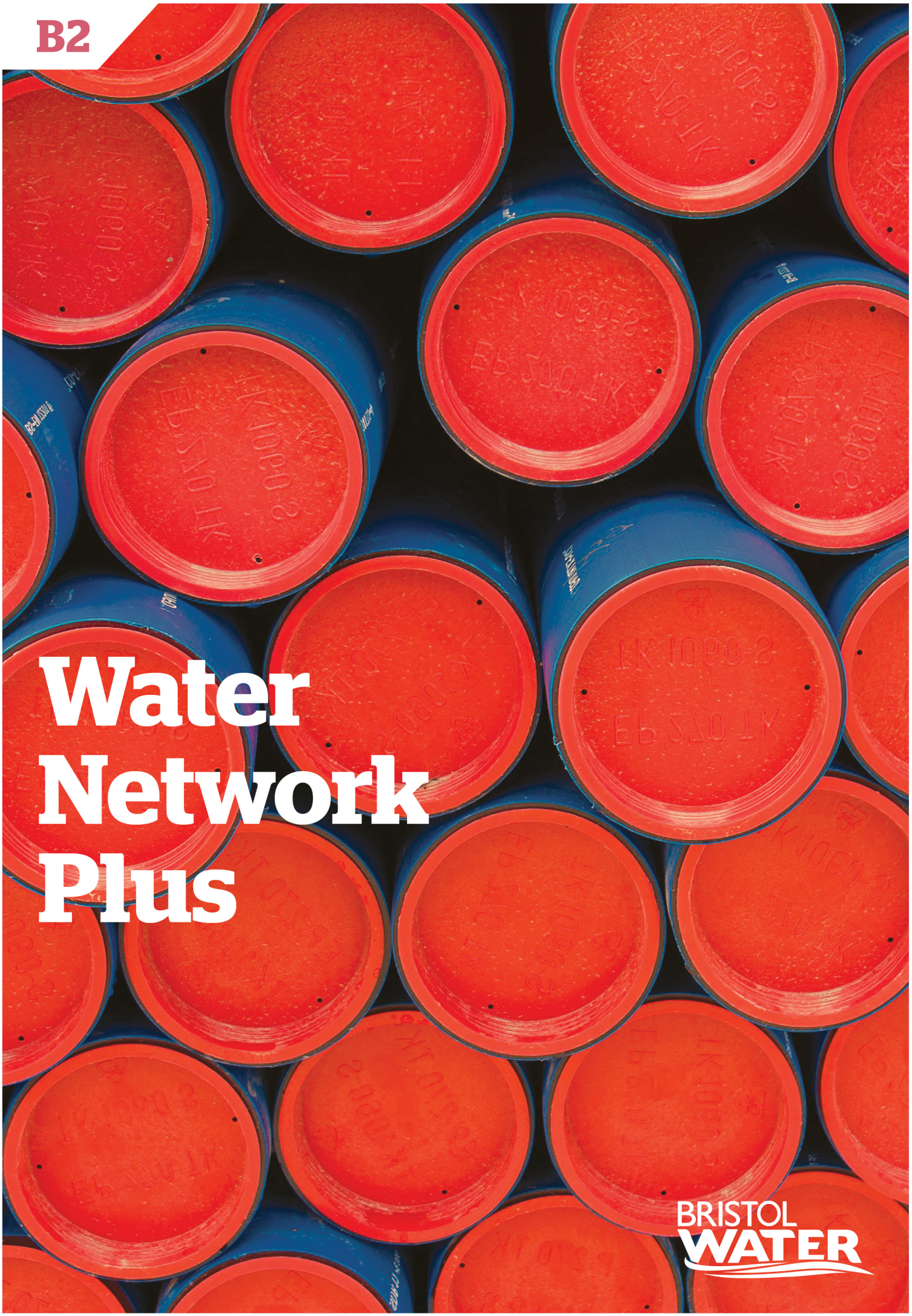
B2



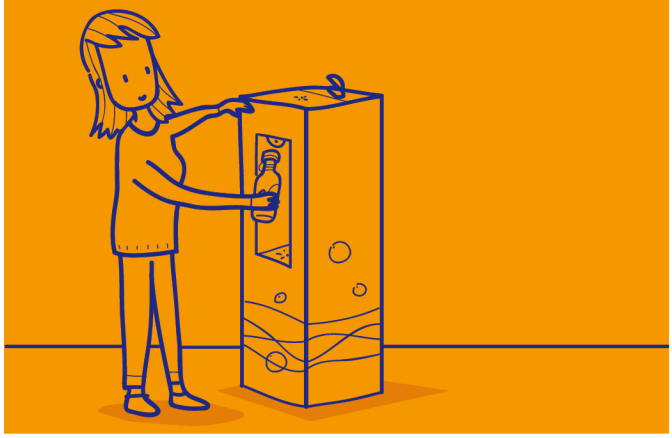
Water Network Plus

BRISTOL WATER

Structure of our Business Plan Submission

Appointee plan

A1
Bristol Water For All

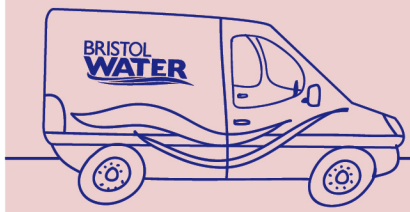


A2
Customer summary

Wholesale controls

B1
Water resources

B2
Water network plus



Retail controls

B3
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Supporting evidence

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Engagement, communication and research

Engagement Summary

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Addressing affordability and vulnerability

C3
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Financeability, risk & return, and affordability

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Track record of delivery

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Securing Trust, Confidence and Assurance

Board Assurance Statement

Contents

1 Introduction

At Bristol Water we recognise that water is at the very heart of daily life for our customers and communities, the environment and ecosystems that we all value and depend upon. We recognise that this means our customers feel differently about water to other services, and that they must have absolute trust in the product that we provide.

Our customers also expect excellent service, which is at least comparable to the service levels which they receive from other sectors in this modern, technological age. They reasonably expect our services to be resilient and provided at an affordable price, including for those who are struggling to pay.

To reflect the evolving nature of the sector, the shape of regulation has changed to encourage an increased focus on delivering efficient and resilient services.

Our Price Review 2019 (PR19) submission has been structured to reflect the separate controls for PR19/AMP7. This is our B2 Water Network Plus document, which summarises our PR19 business plan submission for AMP7 for this area of the business, set in the context of our longer term ambition set out in ***Bristol Water…Clearly***.

Purpose of this document

This document provides information on our Water Network Plus price control plan and the areas covered in this plan are shown in the highlighted box in Figure 1. In this document, we provide information on our proposals for Water Network Plus activity during AMP7 and beyond, within the context of a reporting boundary as indicated in Ofwat's guidance on Regulatory Capital Value allocation, where activity and assets upstream of an abstraction are assigned to Water Resources and (with defined exceptions) activity and assets downstream are assigned to Retail Controls.

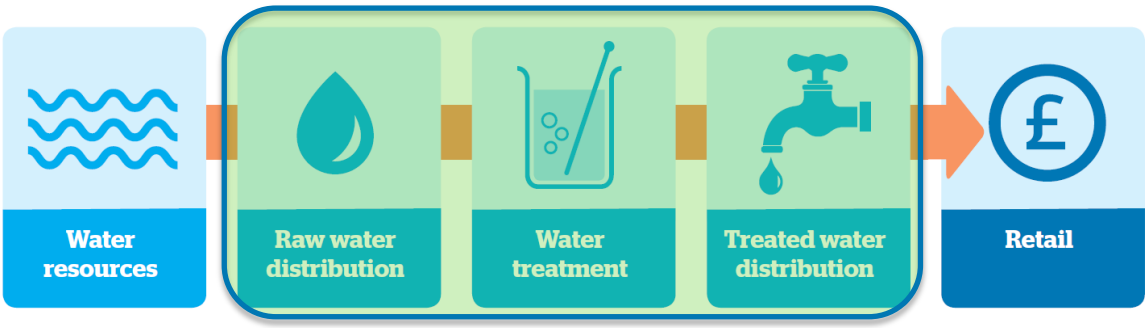


Figure 1 Water Value Chain – Water Network Plus business plan areas

This document describes the outcomes, performance commitments, income, expenditure, efficiency and key investments assigned to this price control area, with the corresponding supporting technical evidence provided through the C documents. It is separate to, but provides an explanation of, financial flows between B1 Water Resources and B3 Residential Retail price control proposals, recognising that the change in approach is needed across the Value Chain, effectively creating internal suppliers and customers across these internal boundaries.

A summary of initial assessment tests is provided in Table 1.

IAP Test area		Questions	Evidence provided in this document
Engaging customers	EC 1	What is the quality of the company's customer engagement and participation and how well is it incorporated into the company's business plan and ongoing business operations?	In **Chapter 3 – Customer Engagement** we set out how the views of our customers and our stakeholders have been central to the development of our plans, as well as being used on a day to day basis to improve our services. We set out how we have engaged over 37,000 customers since 2016 in five engagement phases. • Ongoing programme of engagement. • Mix of engagement methods and research approaches deployed. • Customer priorities, link to performance commitments which links to investment as demonstrated by our Sankey diagram. Further information is provided in document C1 – Engagement, communication and research.
Targeted controls, markets and Innovation	CMI 1	How well does the company's business plan demonstrate that it has the right culture for innovation which enables it, through its systems, processes and people, to deliver results for customers and the environment from innovation?	In **Chapter 7.3– Innovation** we set out our approach to innovation and provide examples of successful projects and collaborative partnerships. Further evidence in document C4: Bristol Water...Clearly Resilient.
	CMI 2	How well does the company use and engage with markets to deliver greater efficiency and innovation and to enhance resilience in the provision of water and wastewater services to secure value for customers, the environment and the wider economy; and to support ambitious performance for the 2020-25 period and over the longer term?	In **Chapter 7.4** we provide an overview of our views in relation to the market principle and of our bid assessment framework Further evidence can be found in document C4: Bristol Water...Clearly Resilient, where we set out our market innovation framework and how this links to resilience. We also include a case study on the potential for water resource trading.

IAP Test area		Questions	Evidence provided in this document
	CMI 5	How appropriate is the company's proposed pre-2020 RCV allocation between water resources and water network plus – and, if relevant, between bioresources and wastewater network plus – taking into account the guidance and/or feedback we have provided?	In **Chapter 8.1.2** we set our RCV allocation, which is consistent with our January submission. Minor updates are related to updated expenditure information in 2017/18 and forecasts out to 2020 consistent with our PR14 reconciliation data. RCV Allocation is 77.93% Water Network Plus. Further information can be found in document C6 - Financeability, risk and return & Affordability
	CMI 6	To what extent has the company produced a bid assessment framework for water resources, demand management and leakage services that demonstrates a clear commitment to the key procurement principles of transparency, equality/non-discrimination and proportionality and the best practice recommendations?	In line with the principles of transparency, we published a consultation on our Bid Assessment Framework in July 2018. The framework is in use as part of our supply chain transformation. Further information is provided in **Chapter 7.4.1**.

IAP Test area		Questions	Evidence provided in this document
	CMI 7	To what extent has the company clearly demonstrated that it has considered whether all relevant projects are technically suitable for direct procurement for customers? Where it has one or more such projects, to what extent has the company provided a well-reasoned and well-evidenced value for money assessment supporting its decision on whether or not to take forward each technically suitable project using direct procurement for customers?	We have no investments that are sufficient for Direct Procurement. Our proposals for Water Efficiency and Leakage are well below the proposed £100m whole life totex trigger. Further information is provided in **Chapter 7.1.**
Securing cost efficiency	CE 1	How well evidenced, efficient and challenging are the company's forecasts of wholesale water expenditure, including water resources costs	We have undertaken both a top down and bottom up efficiency assessment. In **Chapter 7** we describe overall efficiency in the context of the Network Plus control.

Table 1 Initial assessment tests summary

2 Executive Summary

Following an extensive customer engagement programme and through detailed engagement and discussion with our environmental and safety regulators, our Water Network Plus business plan will deliver our customer priorities and all statutory and regulatory requirements. The customer bill in 2025 is forecast to be £172 in total, £125 for the Water Network Plus element. The customer acceptability for our final plan at this bill level is 93%.Our totex expenditure for the Water Network Plus business plan is £376m (2017/18 CPIH prices), delivering statutory duties and key customer outcomes. The plan will deliver a resilient, innovative approach to supply-demand management in the long-term, and will enable us to refine our management approach further in AMP7 and beyond.

We have taken a fresh approach to building our business plan, and there are key differences between our approach in this document and our approach in previous business plans. The most immediate difference between this plan and previous plans is that we have now identified there is no need within the next 25 years for Bristol Water to increase water resources through development of a new raw water storage reservoir. This change has been driven by new climate change modelling, a reduction in projected non-household demand, new technical approaches on headroom management and a growing customer preference that potential deficit in the supply-demand balance should first be tackled through reducing leakage and helping customers to reduce their own demand for water. This has a significant impact on the Water Network Plus Business Plan. This approach will help to ensure that bills remain affordable, while ensuring that our customers continue to enjoy a resilient and reliable supply of good-quality water.

We have a strong track record of delivery in providing resilient service to our customers and we have not imposed any customer restrictions on supply for 28 years, despite several dry periods during this time. Our proposals for the Water Network Plus Business Plan will provide a resilient plan for how we will continue to provide a reliable high quality supply of water to a growing population.

The Water Network Plus business plan has been developed, and refined through modelling and optimisation, to reflect our extensive engagement with customers to understand and incorporate their preferences, priorities and outcomes and their willingness to pay which is covered in the A2 customer summary document.

Outcomes associated with this part of our PR19 business plan are described in brief, providing information on the proportion of each outcome assigned to the Water Resources price control area. Our investment approach ensures we understand and can measure the impact of our investment at both performance commitment and customer priority level. Figure 2 maps our capital investment plan to our performance commitments and to our customer priorities.

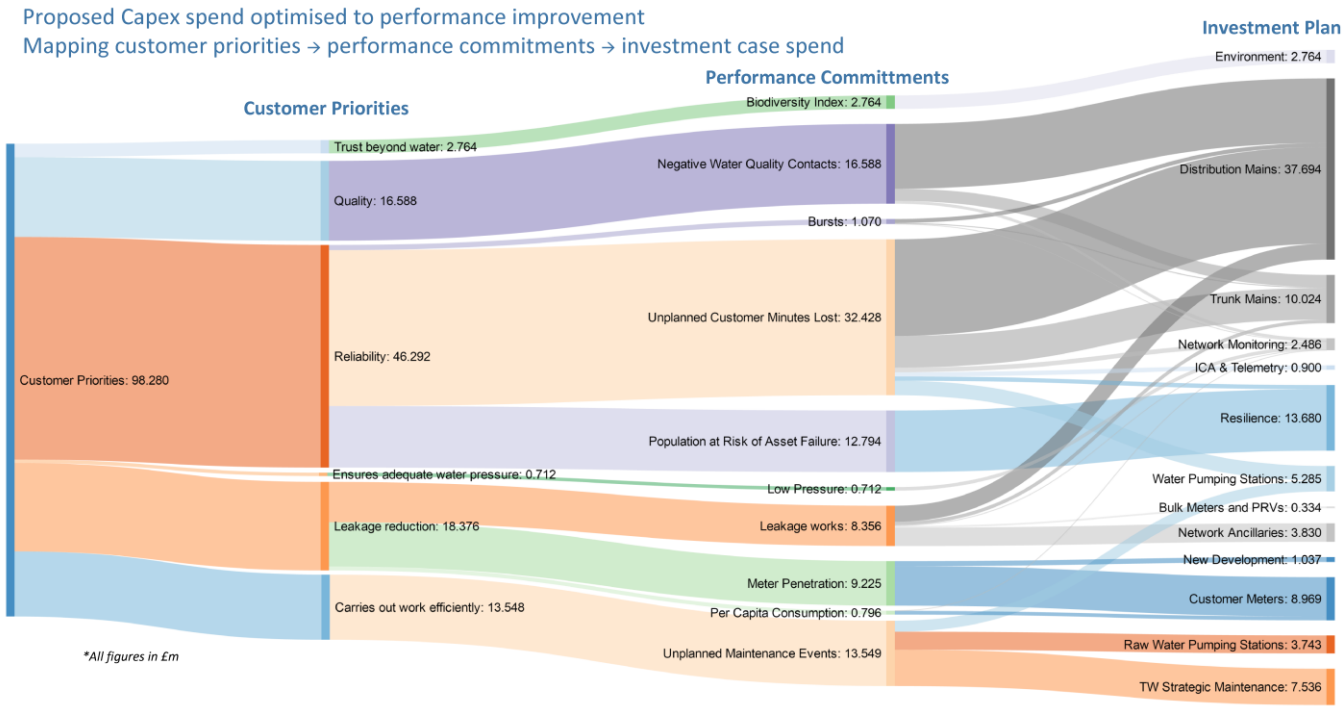


Figure 2 Maps of capital investment to performance commitments and customer priorities

Table 2 summaries the revenue for the Water Network Plus business:

		Annual Water Network						
	Unit	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2020-25
		Notional Structure @ 2017-18 FYA (CPIH deflated)						
Totex	£m		75.3	75.1	72.5	76.0	77.0	375.9
PAYG rate	%		72.2%	72.5%	75.1%	71.9%	71.0%	72.5%
Closing RCV	£m	410.9	409.2	407.2	402.7	401.6	401.4	404.4
RCV run off rate	%		5.36%	5.36%	5.36%	5.36%	5.36%	5.36%
RVC additions rate	%		5.32%	5.32%	5.32%	5.32%	5.32%	5.32%
Wholesale WACC Nominal / Margin	%		5.61%	5.61%	5.61%	5.61%	5.61%	5.61%
PAYG	£m		54.4	54.4	54.4	54.6	54.6	272.5
Return on capital	£m		12.5	12.6	12.7	12.7	12.8	63.3
RCV Run Off	£m		22.7	22.6	22.6	22.5	22.5	112.9
Tax	£m		1.7	1.8	2.0	2.1	2.1	9.6
Post financeability adjustments	£m		(1.9)	(1.9)	(1.9)	(1.9)	(1.9)	(9.3)
Operating income price control	£m		(1.7)	(1.7)	(1.7)	(1.7)	(1.7)	(8.3)
Third party revenue	£m		-	-	-	-	-	-
Third party / principal services	£m		-	-	-	-	-	-
Income non-price control (principal services)	£m		(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(1.0)
Capital contributions from developers	£m		2.8	2.7	2.8	2.8	2.9	13.9
Revenue	**£m**		**90.3**	**90.5**	**90.7**	**91.0**	**91.2**	**453.8**

Table 2 Water Network Plus revenue summary

Our final proposed closing 2020 Regulatory Capital Value allocation to Water Network Plus is 77.93%. The PAYG rate increases significantly compared to the 55% wholesale determined at PR14, which reflects the very different nature of the investment programme. The Southern Resilience Scheme at PR14 reflected an enhancement, and the changing nature of investment towards delivering improvements as part of maintenance sees an increase to a long term PAYG rate of c72.5%.

We adopt a cost of capital of 5.61% nominal, in line with our appointee cost of capital less a 0.1% margin reduction. We do not consider there to be an objective reason to vary the cost of capital between water resource and Water Network Plus, and consider financial viability at appointee level because of the integrated nature of risks. This includes a company specific cost of debt adjustment equivalent to 0.27% on the total weighted average cost of capital (0.45% on the cost of debt).

The total outcome incentives for Water Network Plus amounts from a potential underperformance penalty of £40,472m to an outperformance reward of £21,764m. The 80% central confidence range is underperformance penalty of £22.127m (2.7% Water Network Plus RORE) to an outperformance reward of £10.777m (1.3% Water Network Plus RORE).

Past present and future

Bristol Water was founded in 1846 to provide a reliable supply of high-quality water to the city of Bristol at a time when water resilience had become a critical limiting factor in maintaining the economic growth of this rapidly-developing area. Bristol Water is the oldest water undertaker in the UK and in the last 172 years the company has maintained a water supply to its customers through times of great social, economic and environmental change including periods of extremely severe drought. The population and the area served by the company have grown significantly in this period, and the company has responded throughout by managing demand and developing new water resources when necessary. Because of the long history of the company, we have large datasets available on how our resources behave during drought and how they could be expected to behave during more severe droughts than have been experienced in living memory – and we have developed this approach further by modelling and testing our system resilience to a range of "synthetic droughts".

Thanks to our approach to local service, keeping us at the heart of the community, Bristol Water is the most trusted utility company in the UK[1]. Our customers continue, quite rightly, to expect us to maintain this high standard of service and supply resilience and they have not experienced any supply restrictions since 1990 in spite of several dry periods since this time.

Growth in the West of England is projected to continue at a rapid rate, leading to an increase in population in our supply area from 1.2million people at present to 1.5 million by 2050. To provide a resilient water supply for all our present and future customers in the face of a changing climate, we must plan long-term and take an innovative and ambitious approach. We embrace this challenge: providing excellent service to our customers is what drives our company and we are proud to work on the new opportunities for improvement that our business plan presents.

Through our Water Resources Management Planning (WRMP) activities we have identified a small supply-demand deficit in 2023, at just over half a million litres per day, which we plan to address through demand-side interventions; primarily leakage reduction and increasing meter penetration rates, thus we must recognise the interdependencies between the Water Resources and Water Network Plus business plans as they are intrinsically linked.

Over the past three years, we have improved our comparative efficiency, in our view to the upper quartile level within the industry for both our wholesale and retail services. Although we have made significant improvements, we accept the need for further efficiency improvements in the future and we have therefore set up a Business Transformation Function to deliver further significant efficiencies

[1] Institute of Customer Service – National Customer Service Index 2018

We have identified £40m of new totex efficiencies over 2020-2025 (around 10%). We have put forward a low cost plan aimed at meeting customer expectations and applied an 8% initial efficiency challenge to its delivery. Most of these efficiencies are delivered from 2020, as we prefer to consider our bottom up efficiency challenge from our current transformation plans rather than relying on a future "frontier shift", acknowledging that this is more challenging to deliver.

Customers and innovative partnerships at the heart of the plan

Our plan is built on what our customers have told us that they want. During its development we have carried out significant engagement and research including in-depth engagement workshops where customers have told us that they recognise the importance of a resilient supply but that focus should be on demand management as a matter of principle - particularly on reducing leakage, which we propose to reduce by 15% in AMP7. Customers have also told us that they want to see us doing more to help them to become more water-efficient, fulfilling a role beyond the basic provision of water by thinking long-term and engaging with schools on education programmes around water to help keep bills affordable, improve resource efficiency and provide an industry-leading customer experience.

We are proud that Bristol Water is a trusted local company and is an important part of the communities we serve. In particular our reservoirs are a special asset that our customers enjoy and are proud of, with hundreds of thousands of visits to our sites every year.

We have ensured that the Water Network Plus Business Plan is aligned to the wants and needs of our customers and to our long-term strategic aims:

- We have developed an economic and efficient plan that delivers the outcomes that our customers have told us they value with the right balance of risk and reward for our customers and stakeholders;
- We believe we have developed a fair plan that is affordable for all;
- It is aligned to our Water Resources Management Plan with no planned major enhancements in AMP7; the plan is aligned to customer preferences to achieve an appropriate supply/demand balance, through the right blend of investment rather than developing new storage;
- The plan will deliver a 15% reduction in leakage across the AMP;
- We have taken a long-term view on operational resilience, with a programme phased across AMP7 & AMP8; and
- We have created a plan that has line-of-sight from the right outcomes for customers through to our technical investment cases.

We have sought to develop a balanced and fair plan, which appropriately manages the trade-offs between service level improvements and affordability, risk and reward to customers and the company, with the appropriate incentives for performing well; whilst also delivering stretching and challenging performance commitments.

On a local scale, we believe that we are fundamentally different from other water companies because we are such an intrinsic part of the communities we serve. Following our business leadership role in Bristol's successful bid to become European Green Capital in 2015, we have been able to build on the effective partnerships we have developed with other key stakeholders in the area and we have now

launched Resource West, a new partnership bringing together organisations involved in the broad issues of resource management (water, waste, and energy), together with local academic stakeholders, to develop new initiatives on resource efficiency and showcase the West of England economic area as a "green growth hub" - providing evidence and case studies to demonstrate that strong economic growth is compatible and indeed aligned with sustainable use of resources.

On a global scale for innovation, we are working with city regions across the world as UK lead company in a new global project called SUNEX; the Sustainable Urban Nexus, sharing knowledge and research on the most effective ways to help address the growing resilience issues around food, energy and water and how these fundamental needs interact in a modern city. Partners include Vienna, Berlin and Doha - each with their own unique challenges to address but common themes to share, developing new principles for the best way to manage utilities in modern global cities.

Structured for future success

AMP6 has seen significant change at Bristol Water with changes throughout all levels of the organisation and a refocusing on operational and asset management capability and delivery.

We have developed, and are currently delivering, our Asset Management Capability Improvement Programme (AMCIP), which is the long term roadmap for Asset Management Capability at Bristol Water. This will allow us to continue to grow our maturity in asset management and have set ourselves the target of achieving ISO55000 accreditation as a means of externally verifying and measuring our capability improvements.

Significant improvements in efficiency have been achieved; this plan is very different from that prepared in 2014 in what is proposed and how it will be delivered. As we explain, it is grounded in what has been achieved since 2015, which provides confidence that it can be delivered.

Bristol Water's Board has been closely engaged throughout all stages of the development of this plan and all the phases of our Water Resources Management Plan including testing of our management approach through best-practice drought exercises. Our Board members have all confirmed their ownership of the plan, following full assurance of the plan.

3 Customer Engagement

3.1 Understanding who our customers are

Bristol Water serves 1.2 million people over an area of almost 2,400 square kilometres, from Tetbury in the north to Street in the south, and from Weston-Super-Mare in the west to Frome in the east. To help us understand our customers in more detail, we combined our customer data with other relevant data to form six unique customer segments, as set out in Figure 3. We used these segments to help us understand the different circumstances and behaviours of our customers and to understand how their views may differ to help us target our engagement and communications.

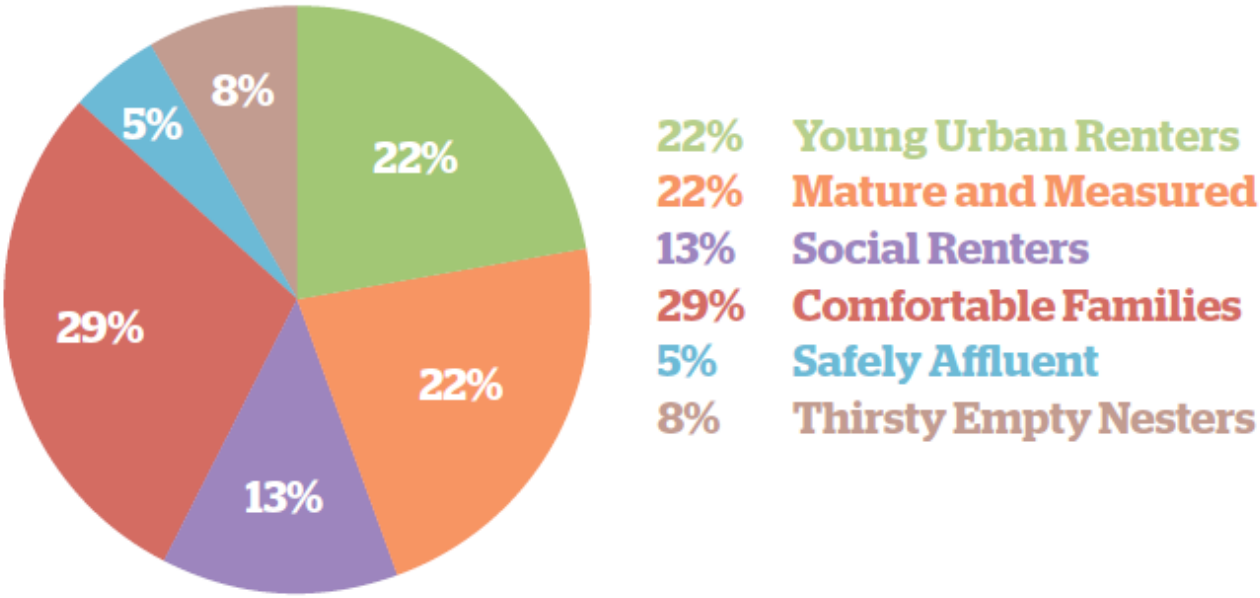


Figure 3 Chart of customer segments

3.2 How we have engaged with our customers

We have taken every opportunity to engage customers throughout the development of our plans and will continue to do so beyond the submission of our plan. Since we started our journey in 2016 we have engaged with over 37,000 customers. Our research approach has ensured that we have a robust, balanced and proportional evidence base to really understand our customers' priorities and expectations. We have used a mix of engagement methods and research approaches including quantitative, qualitative and behavioural research. As well as this we have also drawn on data from a wide range of sources including customer contact and complaints.

As shown in Figure 4, we have taken a phased approach to engagement during which we have taken stock of our existing understanding, gathered evidence on customer views and opinions, tested our proposed options with customers, consulted on our plans and then refined our final proposal. Throughout these stages we have sought to ensure that our engagement activities are customer-centred, transparent, accessible, relevant and sustainable.

Throughout the programme we have made improvements to our business-as-usual work as well as developing a business plan that reflects the priorities of our customers and the services they value. We are proud of our customer engagement work and believe it represents a step change in how we as a water company relate to the communities we serve. Our approach to engaging with our customers has been detailed in the Supporting Evidence document C1 Engagement, Communication and Research.

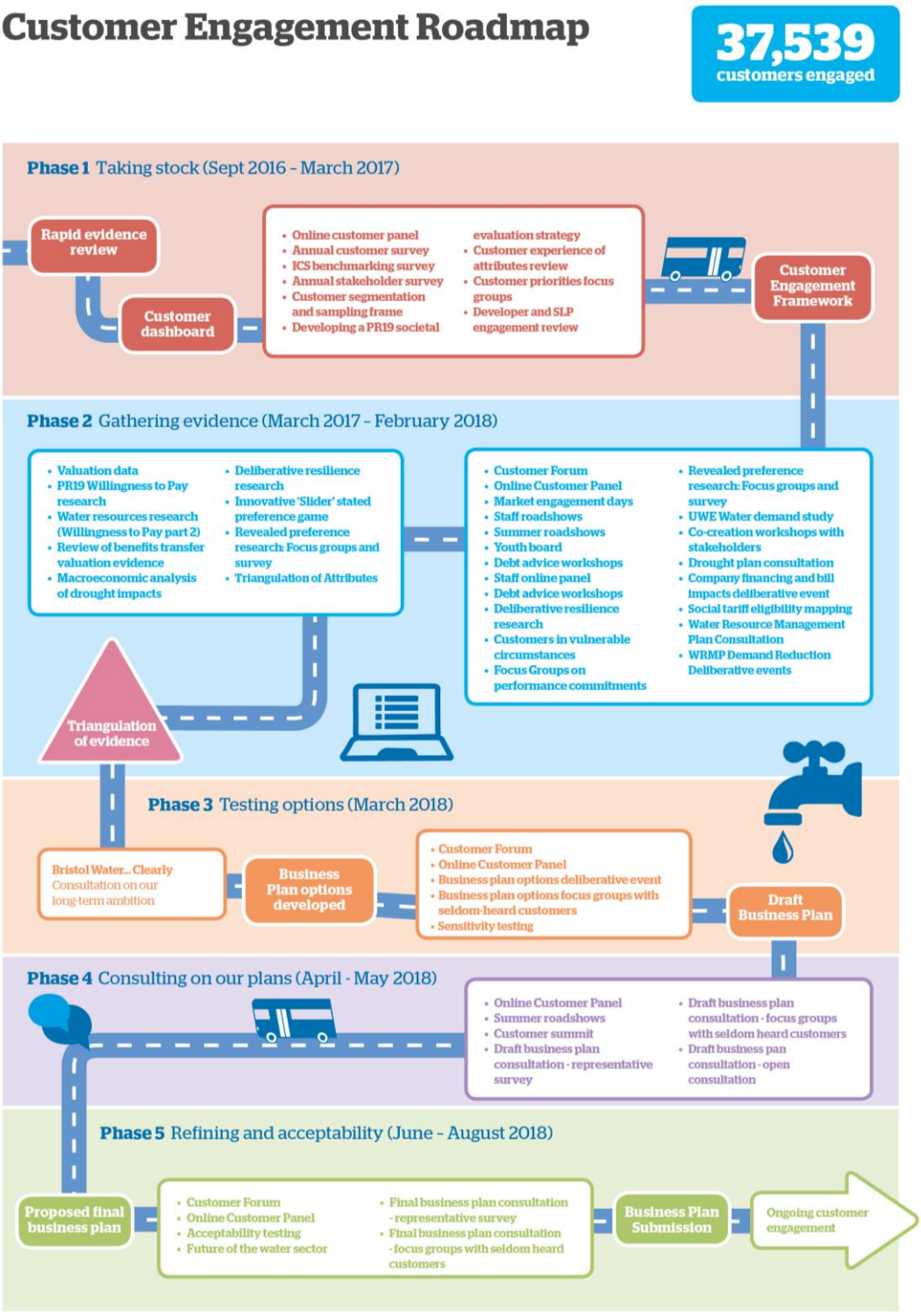


Figure 4 Our customer engagement roadmap

3.3 Our customers' views

3.3.1 Customer priorities

Overall, the top priorities of our customers have remained largely consistent since our last plan in 2014. We learnt from our annual surveys, customer panel, focus groups and our literature review of past engagement, that our customers consistently prioritised having an affordable bill, a reliable supply of water, and having water that tastes good, looks good and has no smell. Other areas of importance included leakage and pressure.

We wanted to test these findings to see if they still resonated with customers so we conducted three focus groups to gain a more nuanced understanding of motivations behind customer views. In doing this, we specifically talked to customers who had recently experienced disruption, and also customers from lower socio-economic backgrounds to learn more about how their experiences affected their opinions about the service they receive from us. We were pleased to find that many customers reported good experiences of our customer service and overall they prioritised affordability, having a water supply that is safe to drink and having water that looks and tastes good which concurs with the insight captured and our analysis of our on-going customer data. In addition conserving water was mentioned by many participants as being important, and as something that people "should" do, and some advocated educating young people about water and water conservation and working more closely with schools. There were mixed opinions around metering and we talk to customers about areas of improvement they often mention speed of resolution and keeping customers informed, particularly those customers who had experienced interruptions.

We gather and collate all of our on-going data in one easy and accessible source to help us analyse and recognise patterns and data trends from as early as 2014. This essentially means we are able to understand customer priorities, complaints and feedback from one user friendly source we call our customer dashboard. This tool combines all sources of our on-going customer insight including:

- Service Incentive Mechanism surveys;
- Monthly tracker;
- Annual perception survey;
- Online panel questionnaires;
- Complaints data;
- Inbound calls;
- Unwanted calls;
- Real-time feedback;
- CCWater Matters Report;
- Social tariff take up;
- Annual DWI report on drinking water; and
- Institute of customer service business benchmarking.

The dashboard shown in Figure 5 and summarised in Table 3 gives us an overview of all the different messages we are hearing from our customers.

Figure 5 Our customer insight dashboard

Service Attribute	Priority (%age of customers rating it very important or quite important)		Customer perception of performance (annual survey) average: 86%	Average satisfaction score from replica survey average: 84.6	SIM dissatisfied (% in 2017/18) n/a	Complaints (% in 2017/18) average: 7%	Inbound calls (% in 2017/18) average: 7%	Overall RAG
Quality	*Provides water that tastes good and has no smell/provide water that looks good*	99.0%	95.0%	88.6%	2.0%	8.0%	9.4%	
Pressure	*Ensured adequate water pressure*	99.0%	94.0%	69.3%	17.0%	5.8%	6.8%	
Reliability	*Provides a regular water supply*	100.0%	99.0%	84.9%	15.0%	2.7%	12.9%	
Leakage	*Repairs leaks as quickly as possible*	100.0%	73.0%	83.7%	19.00%	8.4%	21.1%	
Metering	*Increases number of customers on meters*	76.0%	64.0%	86.6%	2.0%	8.4%	3.3%	
Affordability	*Affordable bills*	99.0%	83.0%					
Road disruption	*Reduces traffic distruption*	99.0%	65.0%			3.2%	0.01%	
Environment	*Helps protect the environment*	98.0%	73.0%					
Lead	n/a			91.9%		0.4%	0.03%	
Service	*Resolves enquires promptly*	99.0%	70.0%	82.80%	13.00%	17.40%	4.40%	

Table 3 Overview of performance against service attributes from customer dashboard (colour key as per Figure 5)

Analysis of the customer insight from the dashboard shows that leakage is the largest cause of dissatisfaction for our customers, they account for 8% of all complaints and 21% of inbound calls. It is a key reason for customer complaints and customers are equally displeased when they contact us about a leak in the road or about a leak at their property. However, industry comparisons show that we perform in the top quartile for leakage. The dissatisfaction stems from the customer experience after reporting a leak with many customers expressing a lack of communication, slow speed of resolution and a lack of updates.

Whilst pressure scores highly in the annual survey for performance, other insights suggest this is an area in need of attention, as when customers contact us due to pressure issues, they are dissatisfied with the outcome. Pressure issues cause 6% of complaints, 7% of inbound calls and account for 17% of the dissatisfied customers from our regular customer satisfaction survey. Average satisfaction of those customers is just below the average for all contacts (84.6%) at 69.3%.

Customers who express negative experiences with service attributes such as reliability and leaks often explain this as being due to poor communication and lack of regular updates. In addition, customers frequently express the need for fuller explanations and more information to answer and resolve their query. Introducing proactive methods as well as self-serve across customers' channel of choice to enable enhanced communication is our principle area to focus on to improve the customer experience during an operational service failure and is a key element of our customer strategy for 2018-2020.

3.3.2 Customer views on water quality & reliability of supply

Water quality is consistently a top priority for our customers. 90% of respondents to our 2018 annual customer survey said that water quality was very important[2], although customers do differentiate between safe water and discolouration which is not harmful, as found in our March 2018 online customer panel[3]. We also know that customers are happy to pay for demonstrable improvements in the incidence of poor taste and appearance. Our triangulation of valuation evidence suggested that customers are willing to pay around £2.10 to avoid a few hours of discoloured water, and around £3.30 to avoid a few hours of water with taste and odour issues[4]. However, when we talked to our customer online panel about discoloured water we found that 63% of the panel wanted us to turn the water back on even if it appeared discoloured. We heard that, in the case of water being off for over 12 hours, 45% wanted the water turned back on even if discoloured no matter how long it had been off for[5]. We found similar levels among customers who had experienced interruptions – with 47% of the 400 customers in our revealed preference research saying they would prefer the water to be back on as soon as possible, and 51% preferring to wait until it is "completely normal"[6]. This suggests that customers prefer water that is clear, but not at the expense of reliable supply and compliance with the water quality regulations.

Reliability of supply is another high priority, 94% of 2018 annual customer survey respondents said that it was very important, although we also find that customers are understanding of one-off events and often focused more on how we could improve our response to them[7]. Our valuation research told us that customers value avoiding interruptions to service, with figures ranging from £91 from domestic customers for a planned interruption of 3 to 6 hours, up to £426.60 for an unexpected interruption of a few days[8]. Our Revealed Preference Research[9] told us that customers who had recently experienced interruptions had spent an average of £12.30 on alternative food, drink and travel. The Revealed Preference Research also gave us valuable insights into how customers felt that we could respond better when things go wrong, which has influenced our plans for customer excellence. For example,

[2] A5e. Annual customer survey 2018
[3] A4g. Online customer panel March 2018
[4] B20. Triangulation by attribute
[5] A4a. Online customer panel April 2016
[6] B15a. Revealed preference research
[7] A5e. Annual customer survey 2018
[8] B20. Triangulation by attribute
[9] B15b. Revealed preference valuation

around 60% of the 400 customers involved in the research reported that they were satisfied with the way we provided information, and many had suggestions for improvements.

Low pressure comes up fairly often in discussions with customers across all our engagement activities and pressure was the cause of around 6% of complaints in 2017/18[10], with a significant proportion of the pressure complaints relating to low pressure. It is understandably more of a priority for those affected than for customers more generally, and it does not appear in our annual survey.

3.3.3 Customer views on resilience and the long term

Resilience is not a topic that our customers immediately raise as a priority when asked about the role of the water company. We talked to 223 customers in a series deliberative events about securing adequate supplies of water in the Bristol area. During these events our customers told us that, over the long-term, they would prefer that we prioritise reducing demand before increasing supply and they see this as having a greater impact and cost. In a game that asked customers how they would like Bristol Water to prioritise various water resource measures we found that demand measures were chosen around twice as often as measures to increase supply[11]. Leakage and water efficiency are the key mechanisms customers want us to use to reduce demand, but they also want us to make the most of our current water sources.

This focus on managing the supply-demand balance through demand reduction measures was supported by 85% of the 265 customers who responded to our consultation; the most common theme of these responses was that we should focus on reducing waste before building new infrastructure. However in the deliberative workshops customers who had spent more time discussing the issues tended to support a mixed approach, because they felt increased supply would be needed in the longer term, beyond the current WRMP[12.]

Our customers have mixed views on metering, some customers are strongly in favour of metering and others are concerned about fairness and the effects on those already struggling with bills. This view matches the findings of our valuation research which shows that, on average, customers do not value the roll-out of meters compared to other service areas[13.] We focused on the link between metering and leakage reduction in our second series of deliberative workshops held with 112 of our customers over the course of a whole day. Across the 112 customers, participants were evenly split when asked to prioritise water meters as a tool to reduce demand. We found that customers in our three highest income segments (Safely Affluent, Comfortable Families and Thirsty Empty Nesters) prioritised water meters more often, while those in the three lower income segments (Social Renters, Mature and Measured, and Young Urban Renters) were more likely to say it was a low priority[14]. When we asked our customers more about their views they confirmed that the potential for increased bills to those less able to manage them was the key concern for those opposed to meter rollout.

3.3.4 Customer views on customer experience

We were pleased to find that many customers reported having had good experiences of our customer service. This finding reflected positive results in the national customer service benchmarking survey we

[10] B4. Customer Experience of Attributes Review
[11] B11. Exploring resilience – deliberative workshops and B23. Demand reduction WRMP deliberative events
[12] B23. WRMP demand reduction deliberative events
[13] B20. Triangulation by attribute
[14] B23. Demand reduction WRMP deliberative events

commissioned and the 86% of our online panel who rated our service good or excellent in our April 2016 survey of 1,600 customers. Customers did identify areas for improvement throughout our research; areas for improvement included speed of resolution and keeping customers informed (especially in our conversations with our customers who had experienced interruptions and in our analysis of our on-going customer data[15]). When we asked our online panel what they would expect us to deliver in the future they highlighted mobile apps, more use of digital and social media and the use of smart meters in order to give our customers more information about their water use[16].

Traffic disruption was an area that caused some dissatisfaction and was the 5th most common reason for dissatisfied calls in 2016/17[17]. We received mixed feedback from customers about whether traffic disruption was something we should address with investment. In our June 2016 online panel survey, 69% of 1,300 customers said they would not prefer a bill increase in order to increase weekend working and reopen roads sooner. Of those customers who were willing to accept an increase most thought this should be limited to no more than £10 per year[18].

3.3.5 Customer views on our business plan options

Our engagement with our customers has resulted in the development of four specific outcomes for PR19, which capture what our customers and stakeholders have said; these are as follows:

- Excellent Customer Experiences;
- Safe and Reliable Supply of Water;
- Local Community and Environmental Resilience; and
- Corporate Financial Resilience.

As we started to develop our business plan options we wanted to involve our customers in shaping the choices. Rather than decide on just one or two options to test with customers in our open consultation, we decided to test a wider array of options in an earlier stage of the process to give customers more ability to influence our plans.

We asked customers to prioritise our draft performance commitments and outcomes in order of importance, and then again with information about the costs of improvements in different areas. Looking across the three outcome areas, our Customer Forum told us that overall they felt reliability warranted the highest investment, followed by local and environmental resilience, and then customer experience with some customers arguing that Bristol Water was already doing well, or suggesting that it was a distraction from the core service.

However, our customer forum also told us that within the outcome areas some attributes were more important than others, for example within reliability some participants wanted to invest more in water quality over discoloured water and pressure, as they felt that water quality was a top priority and everything else was secondary to that. Some participants felt that supply interruptions were inevitable and instead of prevention, we should focus on quick restoration and efficient communication. Participants were overall satisfied with their water pressure but stressed the need for maintaining it. ‘Discoloured water’ was described as nuisance but fundamentally not dangerous; participants felt that compared to the other services, this was the least important from an investment perspective.

[15] B4. Customer Experience of Attributes Review
[16] A4c. Online Customer Panel December 2016
[17] B4. Customer Experience of Attributes Review
[18] A4b. Online Customer Panel June 2016

Within the local resilience outcome, leakage and renewable energy were prioritised because they were both seen as future-proofing investment with capacity to lower bills in the long term. Within customer experience participants prioritised water efficiency, traffic disruptions and metering. A key reason for ranking ‘Water efficiency’ so highly was the recognition that water was a finite resource and needed to be preserved. ‘Traffic disruption' was seen as having a wide-ranging impact and affecting a disproportionately large number of people so participants felt that investing in this would be a good value for money. Metering also scored highly with participants describing it as ‘fair’ and ‘environmentally friendly’, however strong concerns remained around potential bill increases.

Our online panel gave us similar feedback to the forum in our March 2018 survey of 1,500 customers. The online panel prioritised reliability, followed by local and environmental resilience and then customer service[19]. Within each outcome they also told us that the highest priority attributes were water quality, leakage and water efficiency respectively. When our Youth Board carried out a survey of 250 of their peers we found the same pattern[20].

3.3.6 Customer views on our draft business plan

We asked customers to consider three potential plans in a seven week consultation from 29 March to 17 May 2018. The consultation across the three plans was designed to identify the timing and price that customers preferred us to meet our outcomes. We offered three plans which all led to the same long-term ambition but delivered outcomes at different times. Our slower plan offered customers a lower bill but at the price of more gradual improvements to service, in contrast our faster plan asked customers to consider whether they would be prepared to pay more to reach those goals sooner. This consultation period, combined with our research into customer preferences for incentive structures, helped us to understand not just what our customers want us to achieve but how.

We asked customers their views on the three outcomes with performance commitments associated with them, they were:

- Excellent customer experiences;
- Local community and environmental resilience; and
- Safe and reliable supply of Water.

3.3.7 Our overall plan

Much of the feedback on our draft business plan consultation showed us that our customers expect us to deliver good value for money, and they challenged us to deliver services at a lower price[21]. This is in line with our earlier research on how customers respond to different bill levels, which told us that we needed to look hard at how we deliver our plans at a lower price to customers. The majority of our customers favoured the suggested or faster plans for excellent customer service experiences and local community and environmental resilience, but were evenly split on our proposed investment in safe and reliable supply. When we looked at the comments customers made about the options we often found that customers had chosen the plan they felt offered best value. Where customers commented on their choice, those who chose the slower plan often told us that their priority was for the lowest bill possible.

[19] A4g. Online Customer Panel March 2018
[20] A12. Youth Board
[21] B30. Draft business plan consultation – Overall consultation

In contrast, those who chose the suggested or faster plans tended to say that they felt the plans represented a good investment for the future or good value for money.

If we consider the preferences of our customers to deliver at least the suggested plan, by comparing the proportion who chose the slower plan, and those who chose the suggested or faster plans we find that for most of the performance commitments considered the majority of customers would be likely to accept the suggested plan[22].

Looking at the cumulative plan choice as set out in Table 4, we highlight below where customers preferred other plans compared to the slower plan.

		Cumulative view of level of service improvement		
		Slower plan or above	Suggested plan or above	Faster plan
	Overall preference for investment	**100%**	**56%**	**12%**
Excellent customer experiences	**Package**	**100%**	**64%**	**13%**
	Customer experience	**100%**	**66%**	**8%**
	Vulnerability assistance	**100%**	**64%**	**15%**
Local community and environmental resilience	**Package**	**100%**	**56%**	**19%**
	Leakage	**100%**	**56%**	**17%**
	Water used by customers	**100%**	**48%**	**16%**
	Enhancing your local environment	**100%**	**60%**	**22%**
	Stakeholders satisfied with our contribution to the local community	**100%**	**44%**	**12%**
Safe and reliable supply	**Package**	**100%**	**51%**	**15%**
	Water quality	**100%**	**46%**	**18%**
	Interruptions to supply	**100%**	**33%**	**9%**
	Water that doesn't look clear	**100%**	**54%**	**13%**
	Water that doesn't taste or smell right	**100%**	**72%**	**33%**
	Protection against a major water supply event	**100%**	**47%**	**23%**

Table 4 Summary of customer feedback in draft business plan consultation

Our customers also gave us detailed feedback about the performance commitments they felt needed to be addressed at a faster or slower rate and those where our suggested plan felt right to them. A full description of these outputs can be found in Section C1 – Engagement, communication and research. Performance commitments, outcomes and incentives have been created with all of our customer insight as a consideration. We have demonstrated how the research has been used for each measure within Section C3 - Delivering Outcomes for Customers.

[22] B30a. Draft Business Plan Consultation conclusions and recommendations

We concluded that our final acceptability testing should test customer support for the suggested plan at a lower cost, as well as the other specific conclusions[23]. We also decided that we should test the impact of the lower service levels where the slower plan for a service area was preferred (i.e. above 50% for that area). In this way, we determined that we would get a full picture of customer service and bill levels from the wide range of our research.

3.4 Customer acceptability of our final plan

The customer acceptability for our final plan at a bill of £175 is 93%. All proposed service levels were supported. Acceptability ranges from 84% for the most service and price vulnerable customer segment to 96% for the "mature and measured" segment. When expressed with inflation added, the acceptability is 83%.

82% of customers preferred this plan to one with a £4 lower bill and, lower reductions in supply interruptions and slower resilience and water efficiency improvements.

80% of customers also preferred a plan with annual adjustments to outcome incentive payments, rather than adjustments after 2025. However, because of the increased bill volatility such an approach would imply, our customers supported an annual cap on in-period incentive changes to bills of £2.5m (circa £4 bill variation).

Given this process we believe that we have developed a business plan that will deliver the best possible outcomes for our customers, the communities we serve and the environment.

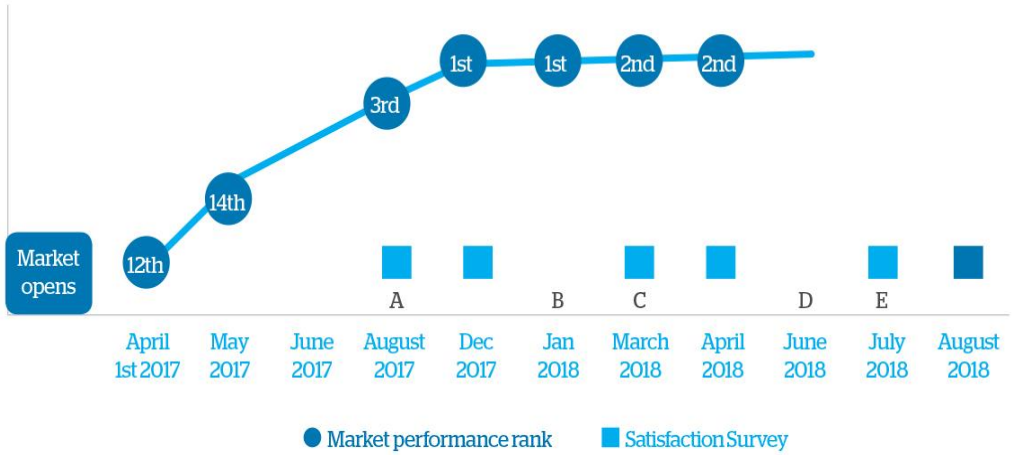
[23] B31. Acceptability testing

4 Engaging with retailers

Since the opening of the retail market, we have engaged extensively with the retailers we serve. A continuous and tailored engagement strategy has been developed with each of our retailers in line with their individual needs and requirements.

Day to day engagement with retailers takes place through a dedicated wholesale service team with a dedicated account manager with a direct line, email and access to our retailer portal to provide a continuous feedback avenue. We also carry out regular surveys to measure our retailers' perception on the service we provide. We have sent five surveys so far, three around ongoing business topics with a focus on continuous improvement (using survey monkey) and two with retailer account managers (using email), one after a major incident which sought feedback on our response and communications before, during and after the incident and one about our PR19 draft business plan. More detail can be found in Section C1 - Engagement, Communication and Research.

We recognise that some of our retailers work across the England & Scotland and are not able to attend multilateral meetings in Bristol. With this in mind our approach has been focused on meeting the retailers at their offices as well as at national events. Quarterly engagement visits are used to gain feedback on our service and how we can improve. The visits are also used as an opportunity to provide retailers with an update on our performance, market performance and comparative information and any company news, including our plans for 2020/25. Figure 6 below details a timeline of our retail engagement to date.



Improvements

A Bi-lateral comms started

B Start the Water Industry Accredited Entity Scheme (WIRSAE)

C Access to Digdat mapping service given to all retailers

D Retail Notification Service launched for retailers

E Pin point app

Figure 6 Timeline of retailer engagement

4.1.1 Spotlight on retailers

The non-household retail market opened on 1st April 2017, within the year our customer base had quickly grown from 3 to 18 active retailers. We have signed contracts with 26 retailers in total. Though the market codes dictate the level and quality of service expected from a wholesaler, our wholesale team continue to innovate and invest in our services and give a tailored and excellent service that goes beyond what the market has officially dictated.

Receiving feedback from our retailers via account meetings, online or email surveys and forums has ensured we are able to adapt and improve the services we offer. We are making continuous improvements to the way we interact and communicate with our retailers and this ensures we are able to provide a consistent a consistently high level of customer service.

Below is a list of innovations and improvements we have already delivered to enhance the customer experience we offer our retailers:

- A bi-lateral function which pre-populates request forms from retailer systems in to our retailer portal rather than having to enter it manually, saving retailers time and minimising the risk of error;
- Free access to Bristol Water's GIS mapping system via a link on our retailer portal so that the retailer has access information on location of their customers supply pipes and meters, saving time and reducing transactions;
- A targeted Retailer Notification System (RNS) went live in June 2018, which provides retailers with tailored notifications regarding their customer;
- A retailer app, Pinpoint provides central marketing operating system (CMOS) data in the field and allows data updates, photos and the location of meters in real time. Discussions are on-going on developing the functionality and usability with our partner Wheatley. This has been recognised as a potential national solution. The app is currently being piloted with our retailers;
- WIRSAE Accredited Entity Scheme – Bristol Water has been one of the designers and driving forces behind a national accredited entity scheme to allow further competition in the market by allowing retailers a choice in who carries out such works as meter changes and disconnections instead of just the wholesaler. The scheme is independently run by Lloyds Register; and
- Branded poster campaign for retailers to share our messages around water efficiency, leakage, water regulations and cold/ hot weather preparation.

We have received positive feedback on these services.

As the market enters its second year, it is important to note that a majority of retailers are still establishing themselves and defining their unique selling point. The main concern thus far has been wholesaler performance and accessibility and we have already started making changes to ensure we excel in customer experience, along with market and operational performance to achieve top 5 within the industry.

We recently conducted a specific PR19 email survey following the sharing of our draft business plan. We have found that, whilst PR19 has been an important segment of the retailers' discussions engagement on the topic has been slow. Following the survey, the feedback we received was positive;

retailers signified that they believed Bristol Water to be performing above other wholesalers. Below are some statements which reflect the feedback we received from our retailers on our PR19 plan:

- Waterscan: *"Bristol continue to be the most innovative wholesaler and their PR19 plans reflect this"*;
- The Water Retail Company: *"Bristol Water's Portal is already one of the most user friendly, so plans to enhance this further are a great idea"*; and
- First Business Water: "*We think your posters are a great idea and wish more wholesalers took a leaf out of you book"*.

4.1.2 Void and Gap sites

During preparations for the retail market, the full 33,500 premises as held by Bristol Water Asset Management systems were used as the starting data set for market entry. This data attributed for each premise was then subjected to a series of data maturation and cleansing activities to ensure that all the data required was market ready in respects to its uniform completeness and quality. The maturation process was completed by using four key data reviews:

- Existing Rapid billing systems data;
- GB Group (Third party industrial data supplier);
- Council / local authority datasets; and
- Google Street view visualisation.

A final matching exercise was conducted with Wessex Water to ensure that data entered into the market for Potable water supplies was complimentary and reflective of their needs specific to Waste Supplies. This data cleansing exercise started in June 2016 and was completed by 31st March 2017. The process as outlined above ensured we went into the market with quality data covering existing voids and capturing any potential gap sites. This drove our decision to not put a gap site incentive scheme in place from April 2017 and for April 2018. The idea of introducing a scheme is reviewed annually during the non-primary services and tariff review. We have not ruled out introducing an incentive scheme.

As part of our work to look at the increasing number of non-household properties being set to vacant by the retailers in the market, we have recently engaged a number of third parties data providers to discuss 6 monthly or annual data check. These checks would also include a postcode gap site check. With the number of commercial new connections being generally low in our area of supply, we believe we successfully manage and capture these connections via our existing new connection process.

When a retailer switches the status of a non-household property to vacant, we receive a market transaction. The wholesale services team then carry out desk top verification and if we have any concerns about the status we will request a site visit. The top 10 vacant non-household properties based on historic water consumption data or size of rateable value, also receive a desk top study on a monthly basis. We are presently also in discussions with a smart metering provider on consumption alarms that can be fitted to the existing meters. This may be a more cost efficient way of monitoring vacant supplies going forward.

Third party providers use a number of external data feeds to validate the market data. These tend to be commercially sensitive, so we cannot share here. Internally we presently use council data sets, company house information, local knowledge, phone records and internet searches. As mentioned before we are talking with a number of third party data organisations about carrying out these data checks on our behalf.

We have not decided to introduce a financial incentive to retailers in the business market to identify gap sites and occupied voids, because its data was of significant quality, there is no need to offer a gap site or vacant incentive at the moment. We feel the incentives should be standardised across the market, reflecting that there would currently be a significant advantage to an associate of the Bristol Water Group given their market penetration following retail exit. This decision is reviewed annually. The work and results of any third party 6 monthly or annual checks will drive or support that decision for 2019/2020.

5 Our outcomes and performance commitments

Our PR19 outcomes framework has been developed through extensive consultation with both customers and stakeholders. We have also taken full account of our legal and statutory obligations. In response to the extensive consultation with our customers and stakeholders described in the previous section, and to deliver our long-term ambition, we have set ourselves four strategic objectives.

Figure 7 Our corporate objectives

Our business plan will deliver improvements designed to meet these objectives. The outcomes of the investments in our business plan will enable service improvements in four areas that customers have told us they value.

Figure 8 Our outcomes

Our full approach on delivering outcomes for customers, with evidence for setting these outcomes, performance commitments, target and incentive levels is provided in Section C3 - Delivering Outcomes for Customers.

Our continuous customer research and the involvement and challenge from our Customer Challenge Panel and our Board have enabled us to ensure that our plans are focused clearly on those things most important to customers and stakeholders. As part of this process we gathered feedback on our initial set of outcomes and the development of our Long Term Ambitions; by early 2018 we had identified the four outcomes. These outcomes are linked to the long-term strategic direction of the company and were included within our long-term ambition consultation.

To ensure we are measuring our performance towards successfully achieving these outcomes we have developed 26 performance commitments that are shown mapped on to our outcomes in Figure 9.

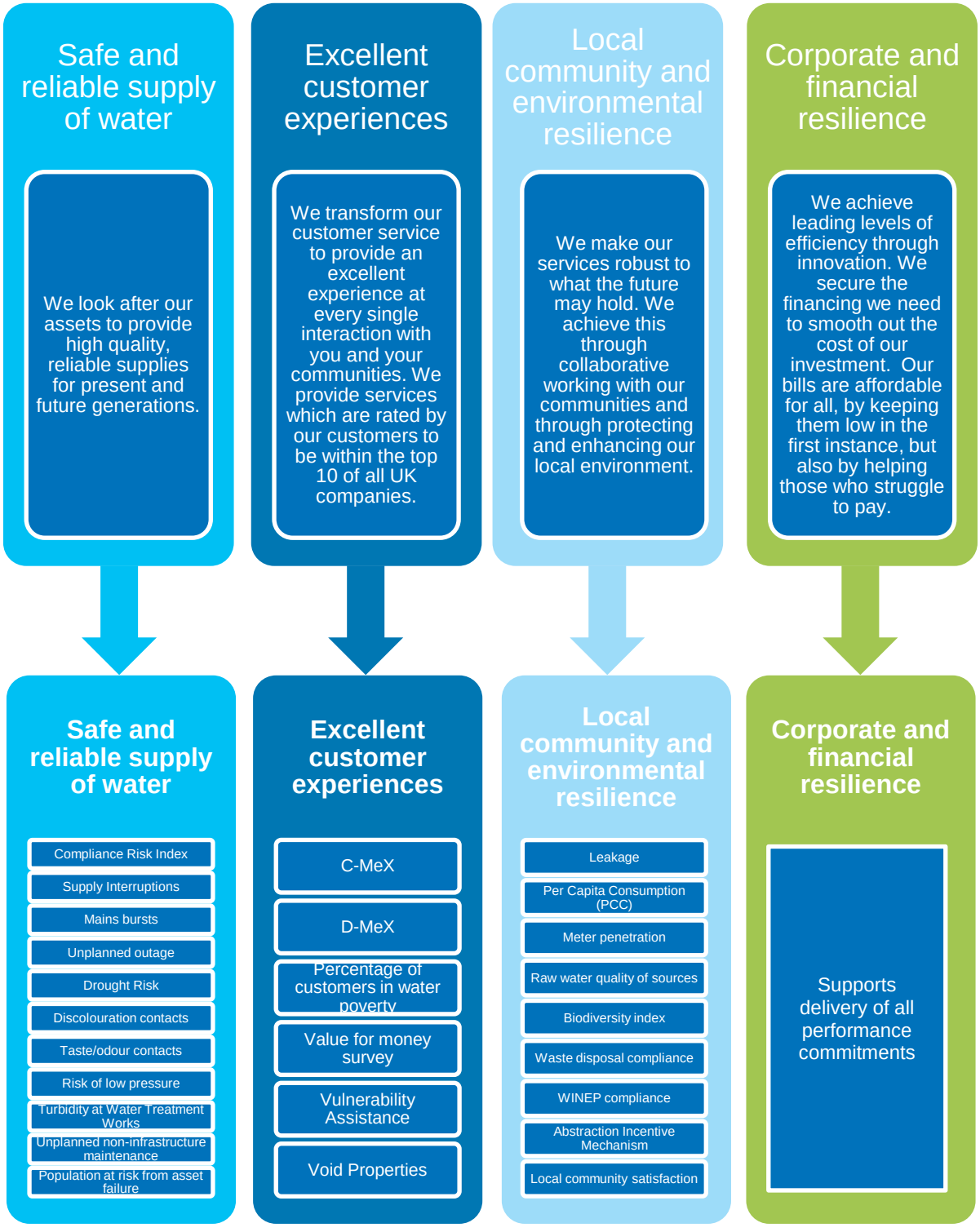


Figure 9 Outcomes and performance commitments framework

The specific performance commitments ensure that priorities are clear for delivery of individual investments and there is visibility for customers and stakeholders of how well we are performing in each area.

We have set stretching performance targets for each of these commitments. To ensure that we are incentivised to deliver against the targets we have proposed financial incentives (outcome delivery incentives, or ODIs) for the majority of the performance commitments, as our customers have told us that they think the majority of incentives should be financial. The outcome delivery incentive framework and associated Incentives and penalties are detailed in Section C3 - Delivering Outcomes for Customers.

5.1 Water Network Plus specific outcomes

The investments contained in our business plan will contribute to the 26 individual performance commitments. Some are wholly delivered by the Water Network Plus investments, some in part and others by investments described in the Water Resources and Retail Residential Sections B1 and B3 respectively.

We have developed our Water Network Plus investment plan to ensure that we can map the individual investment cases through to our performance commitments, which in turn we can map through to our customers' priorities. This gives us confidence that our planned interventions are aligned to delivering the performance commitments that are important to our customers and stakeholders (see Figure 2 Sankey Diagram in the Executive Summary of this document).

To ensure we understand the contribution of our Water Network Plus Business Plan to delivering performance commitments and outcomes we have analysed and assigned the appropriate contributions, in percentage terms, to each outcome, full details of this allocation can be found in the PR19 Data Table App1.

Table 5 below shows our performance commitments associated with our Water Network Plus Business Plan and the allocation to Water Network Plus for each commitment. The outcome incentives are also summarised below, showing the full incentive range of 2020-25 for this price control; where a performance commitment is split between price controls, only the incentive amount that applies to Water Network Plus is shown.

Out-come	Performance Commitment	Allocation to Water Network Plus	Unit Measurement	2020 Baseline	2025 Target	Max Out-performance ODI including P90 (£m)	Max Under-performance ODI including P10 (£m)
Excellent customer experiences	Developer services measure of experience (D-MeX)	100%	D-MeX score		TBC	0.348	-0.695

Out-come	Performance Commitment	Allocation to Water Network Plus	Unit Measurement	2020 Baseline	2025 Target	Max Out-performance ODI including P90 (£m)	Max Under-performance ODI including P10 (£m)
Safe and reliable supply of Water	Water quality compliance	100%	Compliance risk index (CRI) score	1.27	0	-	-1.354
	Supply interruptions	100%	Hours: mins: secs per property per year	0:12:12	0:01:48	1.724	-4.644
	Mains bursts	100%	Mains bursts per 1,000km	142	133	-	-3.890
	Unplanned Outage	100%	Proportion of unplanned outage of the total company production capacity	1.74	1.74	-	-0.496
	Customer contacts about water quality – appearance	100%	Contacts per 1,000 people	0.93	0.43	0.233	-0.661
	Customer contacts about water quality – taste and smell	100%	Contacts per 1,000 people	0.44	0.25	0.157	-0.157
	Properties at risk of receiving low pressure	100%	No. of properties	69	60	0.598	-1.598
	Turbidity performance at treatment works	100%	No. of failures	0	0	-	-4.171
	Unplanned maintenance – non-infrastructure	100%	No. of jobs	3976	3272	-	-4.722
	Population at risk from asset failure	100%	No. of people (population)	832,886	290,000	5.976	-6.440
Local community and environmental resilience	Leakage (annual)	100%	Megalitres per day (Ml/d)	43	36.5	9.377	-7.890
	Per capita consumption (PCC) (annual)	50% (other 50% residential retail)	Litres per head per day (l/h/d)	142	135	0.431	-0.817
	Meter penetration	100%	% metered supplies	65.9	75	1.909	-1.806
	Biodiversity Index	50% (other 50% water resources)	Biodiversity Index score	17658	17711	0.180	-0.067
	Waste disposal compliance	100%	% waste disposal compliance	100	100	-	-0.043
	Local community satisfaction	100%	% stakeholder satisfaction	75	85	0.831	-1.021

Table 5 Water Network Plus performance commitments and outcome delivery incentives

The total outcome incentives for Water Network Plus amounts from a potential underperformance penalty of £40,472m to an outperformance reward of £21,764m. The 80% central confidence range is underperformance penalty of £22.127m (2.7% Water Network Plus RORE) to an outperformance reward of £10.777m (1.3% Water Network Plus RORE).

Our full approach on delivering outcomes for customers, with evidence for setting these outcomes, performance commitments, target and incentive levels is provided in Section C3 - Delivering Outcomes for Customers.

6 Our plans for 2020-2025

6.1 Securing long-term resilience

We believe that resilience is a critical issue for our organisation and those we serve. It is essential for building trust and achieving customer excellence. We recognise that 'resilience' is a challenging concept to define and communicate.

Ofwat has published Resilience in the Round to guide the industry and to present examples of best practice. It defines resilience as the ability to cope with, and recover from, disruptive events to maintain services for people and protect the natural environment, now and in the future.

To guide our delivery of resilient and sustainable services, we have developed our Resilience Framework

The Resilience Framework:

1. Links our corporate objectives and outcomes the four elements of resilience: operational, service, corporate and financial;
2. Focuses on how these aspects of resilience support customer and stakeholder expectations; and
3. Highlights the importance of innovation, transformation and continual improvement to all components of resilient service delivery.

Our Resilience Framework provides a vehicle to deliver on the expectations the government and our regulators have of us:

- It reflects Cabinet Office guidance on providing resilient infrastructure through the 4 R's of
    - Resistance;
    - Reliability;
    - Redundancy; and
    - Response & Recovery.
- It builds on Ofwat's Resilience in the Round ethos and acknowledges that our services rely upon operational, corporate and financial systems.
- It supports the expectations of Natural England and the Environment Agency to enhance the environment, improve resilience, and sustain a high level of performance and operate in a way that best protects people and the environment.
- It acknowledges our commitment to always deliver full compliance with our statutory obligations for drinking water, governed by the Drinking Water Inspectorate.

Importantly our Resilience Framework also aligns with the thinking of our regional partners, such as the West of England Combined Authority (WECA) and Bristol City Council. Using our complimentary frameworks, we can work together to deliver local community resilience which empowers people and businesses, and which protects and enhances our environment.

We have developed a robust approach towards delivering operational resilience for customers today and in the future. One of the four customer priorities is “Keeping the water flowing to your tap”. Reducing the impact on our customers from asset failure is a key strand to our strategy for delivering this priority.

Our plan uses an optimal combination of operational strategies and capital investment to improve resilience of our supply by preventative, as well as response and recovery, measures. This integrated approach builds on best practice in resilience management. In contrast to our previous plans which relied on major enhancement investments, our wholesale plan is predominantly based on maintenance and operating cost interventions, increasing as a proportion of total expenditure from 55% to circa 74%.

6.1.1 Delivering operational resilience

Operational resilience is the ability of our infrastructure and resources to avoid, cope with and recover from disruption in its performance. Operational resilience therefore relates primarily to our physical assets and focusses on hazards such as intense weather, asset failure and cyber security.

Operational resilience ensures we can continue to provide clean water to our customers. It enables us to achieve our objective of Being Trusted, and to deliver on our outcome of Safe and Reliable Supply of Water.

Effective risk management is key to maintaining operational resilience and it requires us to consider both external and internal threats.

Climate change is a major external threat; from the potential impacts of warmer temperatures on water quality, to the effects of freeze/thaw on the condition of our pipes. We need to maintain effective asset monitoring systems, tools to help us predict failure, and the procedures to respond at the most appropriate time.

Cabinet Office guidance explains that resilient infrastructure comes from four types of activity:

- **Redundancy** – to provide backup capacity;
- **Resistance** – to provide the protection to resist the hazard or its primary impact;
- **Reliability** – to ensure that assets can perform under a range of conditions; and
- **Response & Recovery** – to ensure fast and effective response, by planning, preparing and exercising in advance of events.

To provide robust solutions, our initiatives will combine all four types of activity.

An example of our operational resilience strategy is to reduce the risk of population centres of greater than 10,000 being at risk of failure of the asset serving them (providing less than 3m water pressure for a duration greater than 30 minutes) within a 24 hour period. We intend to achieve this strategic ambition across 2 AMPs, delivering 65% in AMP7 and the balance in AMP8.

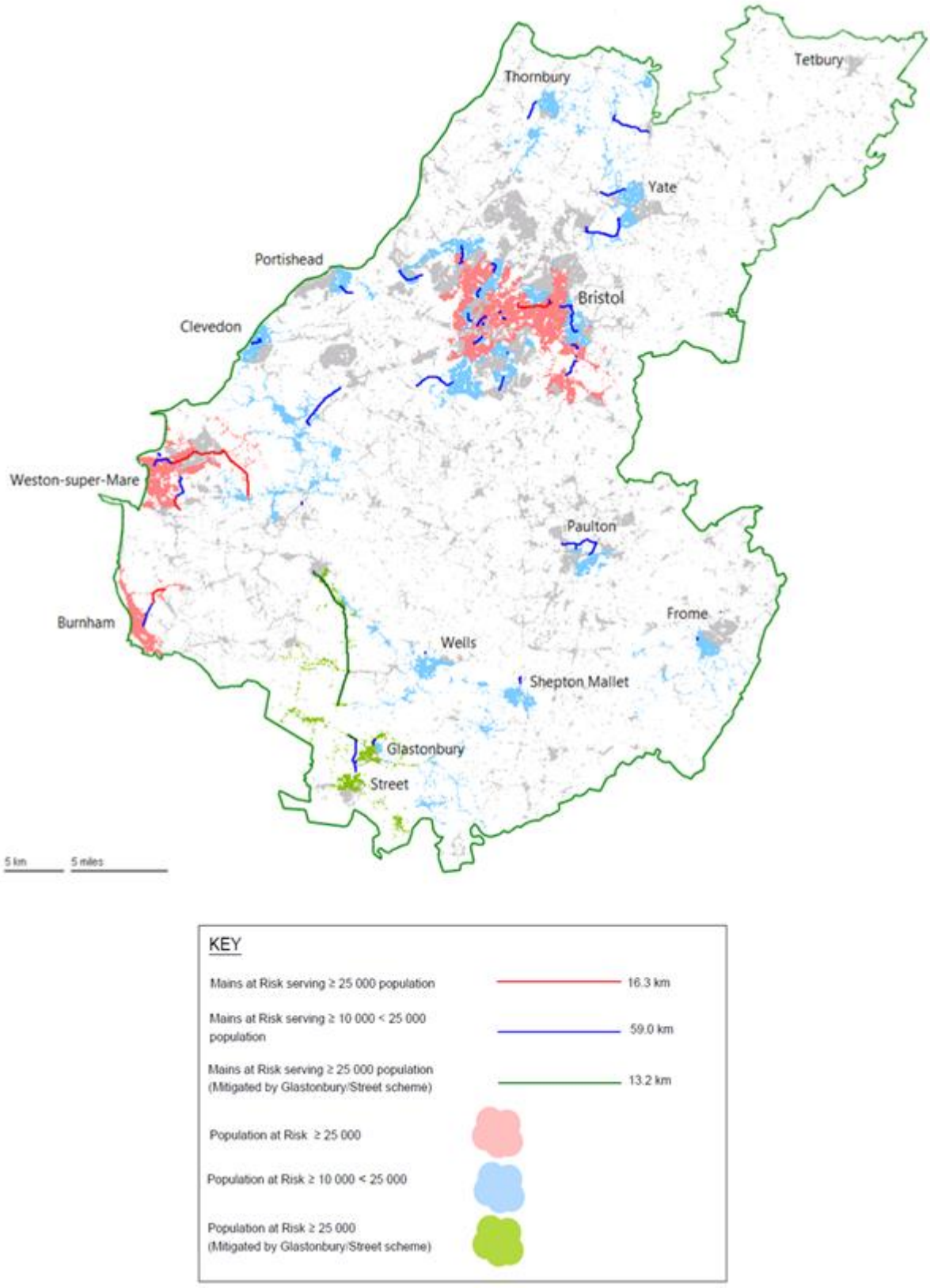


Figure 10 Operational resilience for population centres >10,000 customers at risk

Our approach to operational resilience focuses on understanding our assets; their importance to service delivery, their condition, and their performance. We then analyse this data to identify solutions which deliver maximum value to our customers. Our approach to managing assets in this way is aligned to best practice international standards (ISO 55001).

Our ability to deliver resilience over the long-term is developed through our water resources planning process, informed by stakeholder views, customer research and engagement. Our draft Water Resources Management Plan sets out how we will manage and develop water resources to consistently meet our water supply obligations - we will focus on reducing leakage and water demand, and better sharing water resources with neighbouring water companies.

6.2 Our approach to developing our investment plans

6.2.1 Our journey to achieve world class asset management capability

We have been on a transformation journey since the last price control period. We have seen a significant change at executive management level. We recognise that good asset management capability is a key enabler to ensuring that we deliver for our customers so we have created an Asset Management Directorate and appointed a dedicated Asset Management Director.

This has refocused the asset management capability at Bristol Water and has delivered a demonstrable improvement in asset management maturity across all areas, which has been independently assessed by external consultants. Our aim is to achieve level 3 in all areas by 2020, which means that we can demonstrate that we systematically and consistently achieve relevant requirements set out in ISO 55001. Figure 11 highlights our improving maturity.

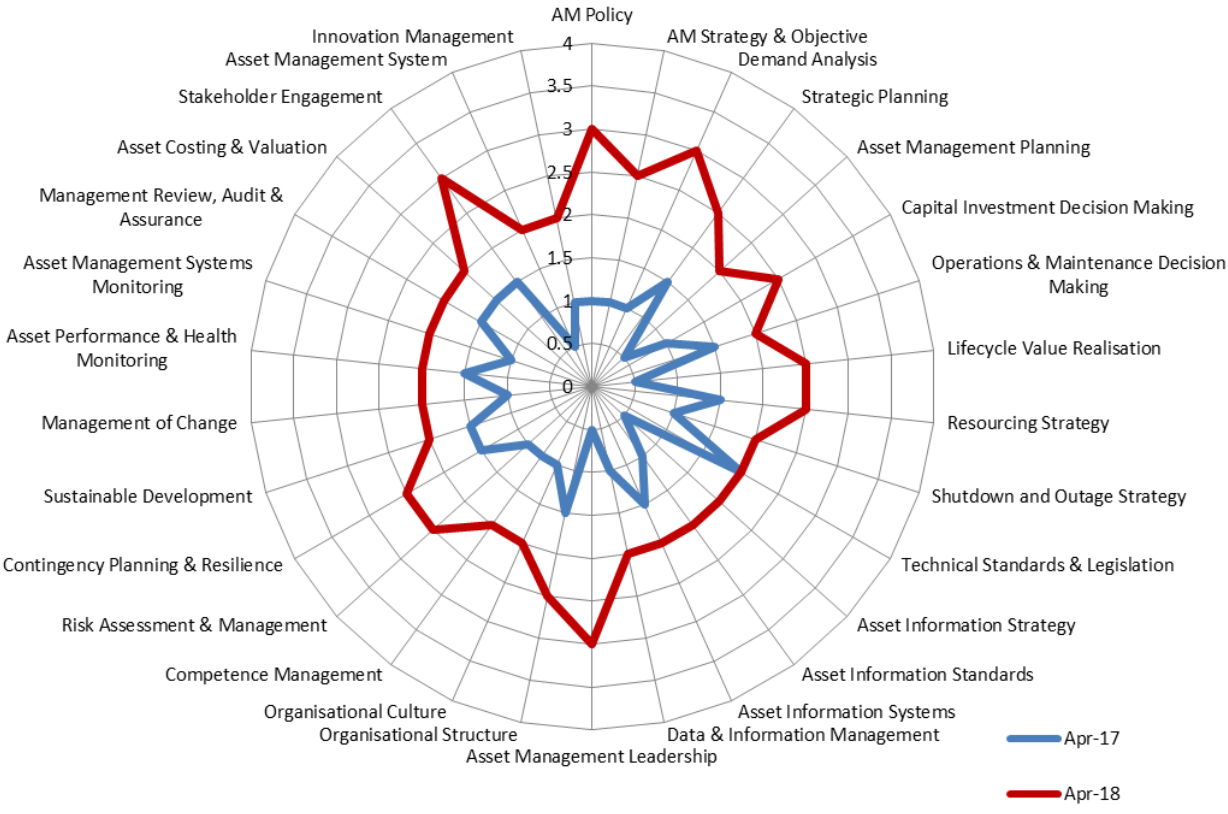


Figure 11 Asset management maturity assessment – April 2017 and April 2018

We are currently delivering our asset management capability improvement programme, which is the long term roadmap for Asset Management Capability. This will allow us to continue to grow and we have set ourselves the target of achieving ISO55000 accreditation as a means of externally verifying and measuring our capability improvements. The key areas identified as priorities and the associated outcomes are set out in Figure 12.

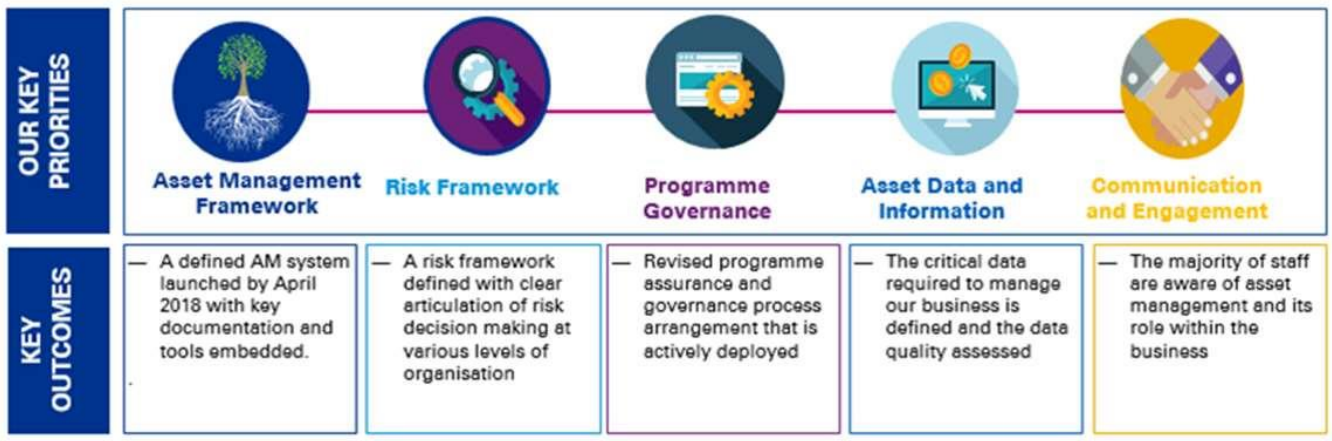


Figure 12 Asset management capability improvement programme priorities and outcomes

6.2.2 Asset management framework

To support our asset management capability improvement we have introduced our asset management framework which is designed to enable the efficient and effective planning and delivery of all our asset related activities to successfully deliver our business outcomes. Our asset management framework is shown in Figure 13.

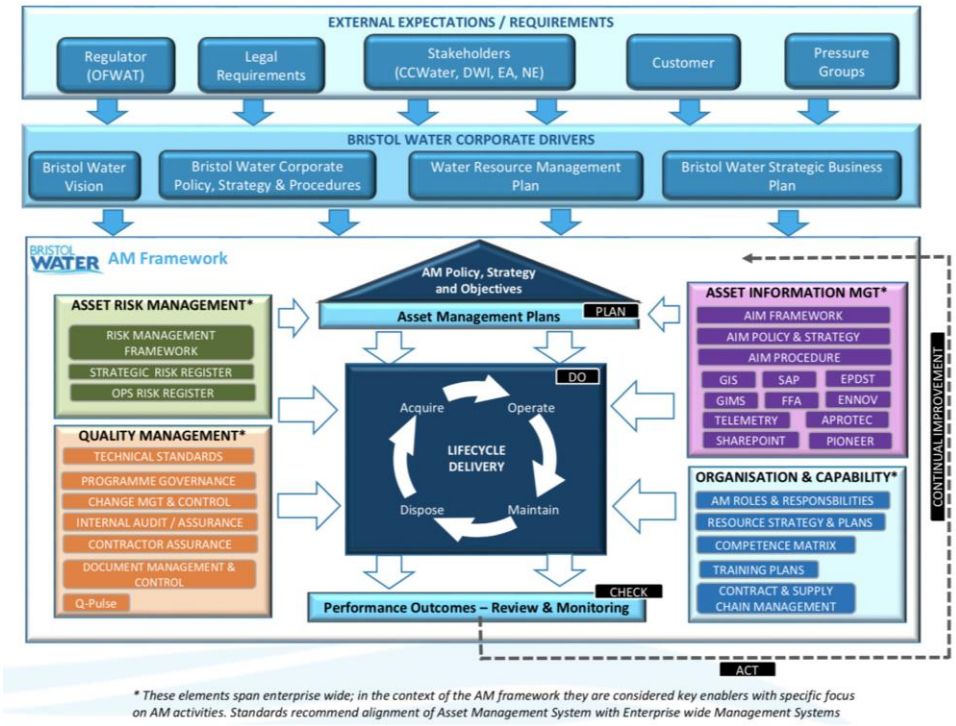


Figure 13 Asset management framework

The framework provides the structure for our ISO55000 aligned management system and the framework aligns to and interacts with our corporate drivers, which in turn are there to deliver the external expectations and requirements placed upon us by our stakeholders.

This alignment – or 'line of sight' – enables our teams to carry out their day-to-day asset management activities and trace the rationale for what they are doing through the corporate and asset management objectives.

Effective asset management decision-making is essential for our organisation to maximise the value realised over the lives of our assets. This capability is embedded in our organisation to consider the challenges faced and the approaches managing the main stages of an asset's life: acquisition/creation; operation and maintenance; end of life, which includes decommissioning, disposal, and renewal.

We recognise that good control of the activities, and associated risks, to acquire, operate, maintain and dispose of assets is essential for the successful delivery of the asset management plan is key and will build strong capabilities and processes, with appropriate governance to enable this.

We will focus on integration of all the activities across the life cycle to enable greater efficiency by reducing avoidable downstream costs. For example, good design, procurement and asset operation practices will reduce the level of corrective and reactive maintenance that is needed, and increase our asset reliability and availability, delivering additional value at a lower cost.

We have adopted risk-based approaches to our asset performance to ensure we deliver our outcomes. We will continue to refine this risk based approach as our asset capability matures.

In the future we plan to embed asset performance and health monitoring processes and measures to assess the performance and health of our assets using a cascade of key performance indicators down from our corporate objectives and outcomes. The indicators will be both leading and lagging to allow for the prediction of future asset performance and health as well as the assessment of current or historic performance.

Contingency planning & resilience analysis processes and systems will ensure we are able to continue to either operate our assets to deliver the required level of service in the event of an adverse impact or maintain the safety and integrity of the assets (whether or not they operate).

Sustainability is a key consideration within our planning activities to ensure an enduring, balanced approach to economic activity, environmental responsibility and social progress to ensure all activities are sustainable.

Assurance and quality is key to all we do and delivery, and within our asset management capability model, we recognise the need for a range of capabilities relating to these disciplines, along with change management, technical standards, document management and contractor assurance.

We rely on asset data and information as key enablers across the breadth of asset management activities. Our core and specialist data and information requirements have been identified to enable efficient and effective planning, decision making and operations of all our assets and services.

We recognise that, like all asset intensive organisations, we do not have perfect, or in certain cases, adequate asset information in terms of either the quality or quantity we really require. Because of this, we assess and prioritise activities to focus on information improvement areas that will provide most benefit.

Shown as the foundation within our asset management capability model, performance outcomes will be continually reviewed and monitored, both through leading measures for having the right objectives and strategies in place and 'real-time' and lagging measures to monitor the impact of those strategies, through our asset plans, in delivering services and products to our customers.

We will use the intelligence we gain through these activities to continually improve our strategies, capabilities and management system to assure future performance and successful delivery of regulatory and other outcomes.

6.2.3 The asset management operating model

Derived from the framework and aligned to the corporate operating model, the development and implementation of an appropriate asset management operating model has been the first step in achieving our ambitions for asset management.

We have developed our PR19 business plan to deliver the outcomes our customers want in AMP7 whilst always setting the 2020-2025 period against our long term ambitions.

We have consciously developed the business plan ensuring there is a line-of-sight from our long-term corporate strategy through the strategic hierarchy set out in Figure 14 below.

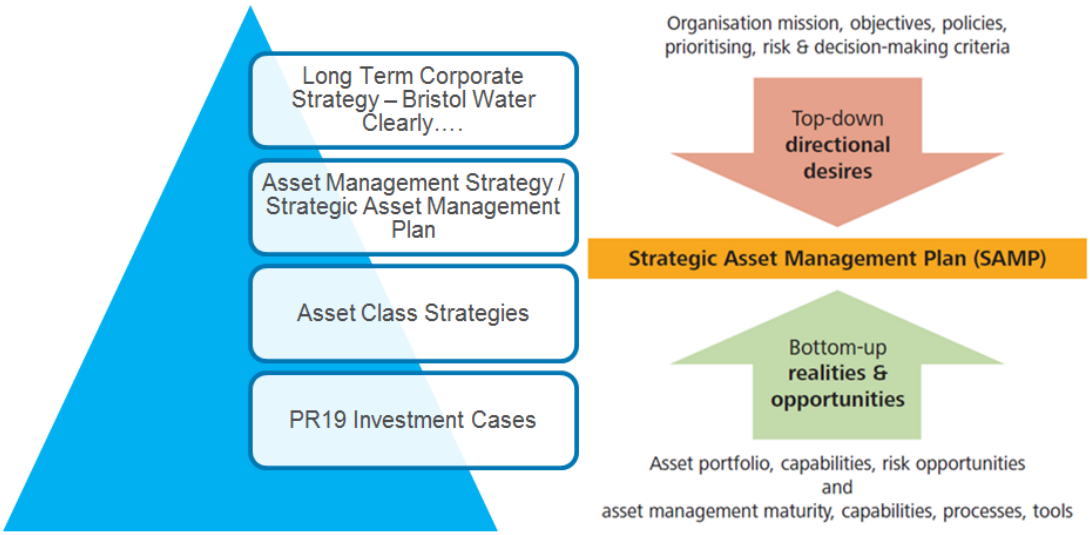


Figure 14 Our asset management strategic hierarchy

The hierarchy reflects a top-down and bottom-up approach to our business plan where we can demonstrate that the individual asset investment cases are aligned to the delivery of outcomes and our long term ambition.

6.2.4 Development of our PR19 investment cases

We have adopted totex principles to determine how we should invest in order to deliver customer priorities and associated performance commitments. The totex risk based approach we have adopted considers which the best solution is because it is the lowest cost over the whole life of the asset, regardless of whether it is operational or capital expenditure. Our asset management totex focused approach is set out in Figure 15.

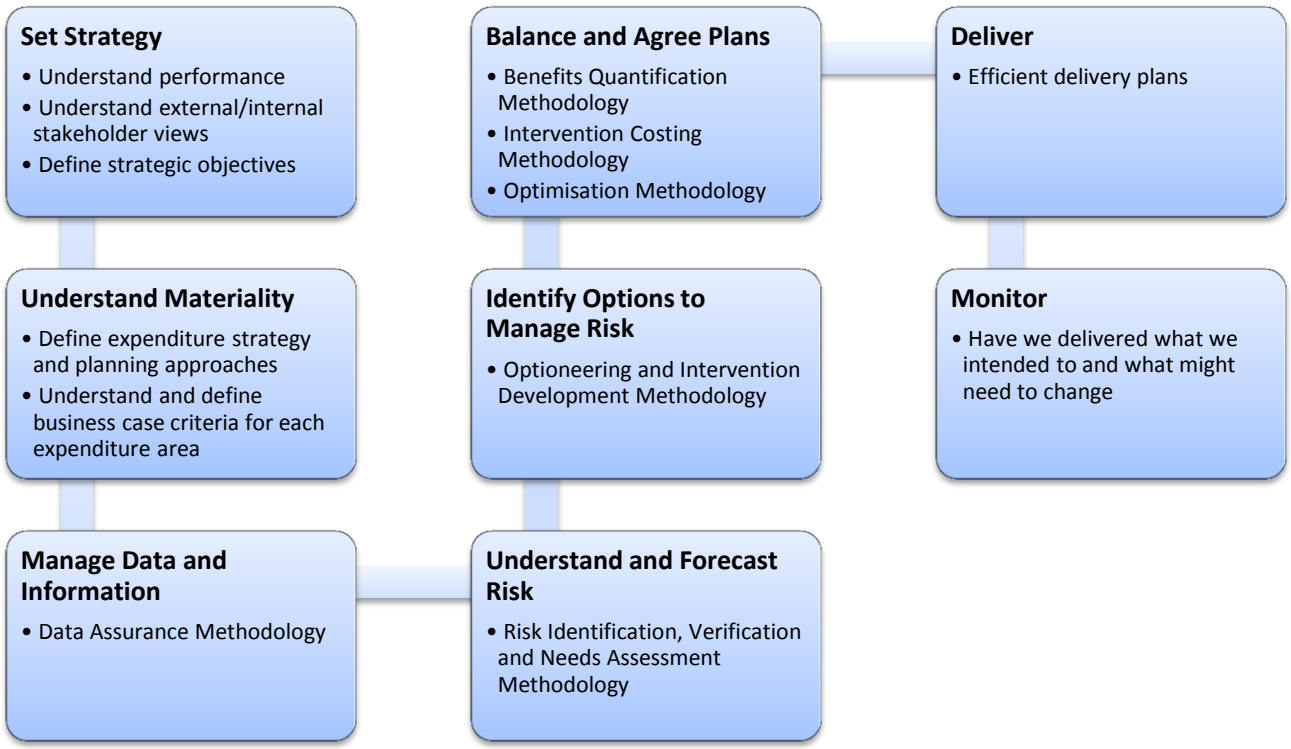


Figure 15 Investment case development process

Whilst we do not currently have health and risk indices across our asset groups, we do have a wealth of data. In some cases, analytical models such as the mains deterioration model, provides us with a view of how our assets are performing, as well as a view on their deterioration.

We have also adopted a water industry standard system (Servelec 'Pioneer') as a decision support tool to help us to optimise our AMP7 investment plan. Pioneer provides the functionality for us to assess all interventions developed across all of the investment cases. It will assess the interventions both individually and in comparison to other interventions. It is a decision support tool that produces an optimal investment plan to meet the targeted performance commitment improvements required in AMP7.

The Pioneer investment optimiser model assesses interventions primarily on the overall benefit, which takes account of performance and whole life costs. The investment optimiser calculates the whole life cost as the net present value (NPV) over 40 years. This determines if an intervention is cost beneficial.

As with all good asset management approaches, our line of sight starts with our customers and takes us all the way through to successful delivery, monitoring and measuring progress along the way.

To develop our investment plan we have created and implemented a process that is supported by a set of six methodologies. When developing the methodologies we wanted to ensure that they:

- Deliver what the customers have asked for;
- Satisfy our business needs; and
- Deliver a high quality business plan in accordance with Ofwat's company monitoring framework.

The collective application of these methodologies has enabled us to develop investment proposals that are well evidenced through a line of sight approach, ensuring our investment plan achieves the required targets at the optimal cost.

Figure 16 illustrates, at a high level, the process used to identify risks that we need to mitigate in AMP7, and the subsequent development of appropriate interventions.

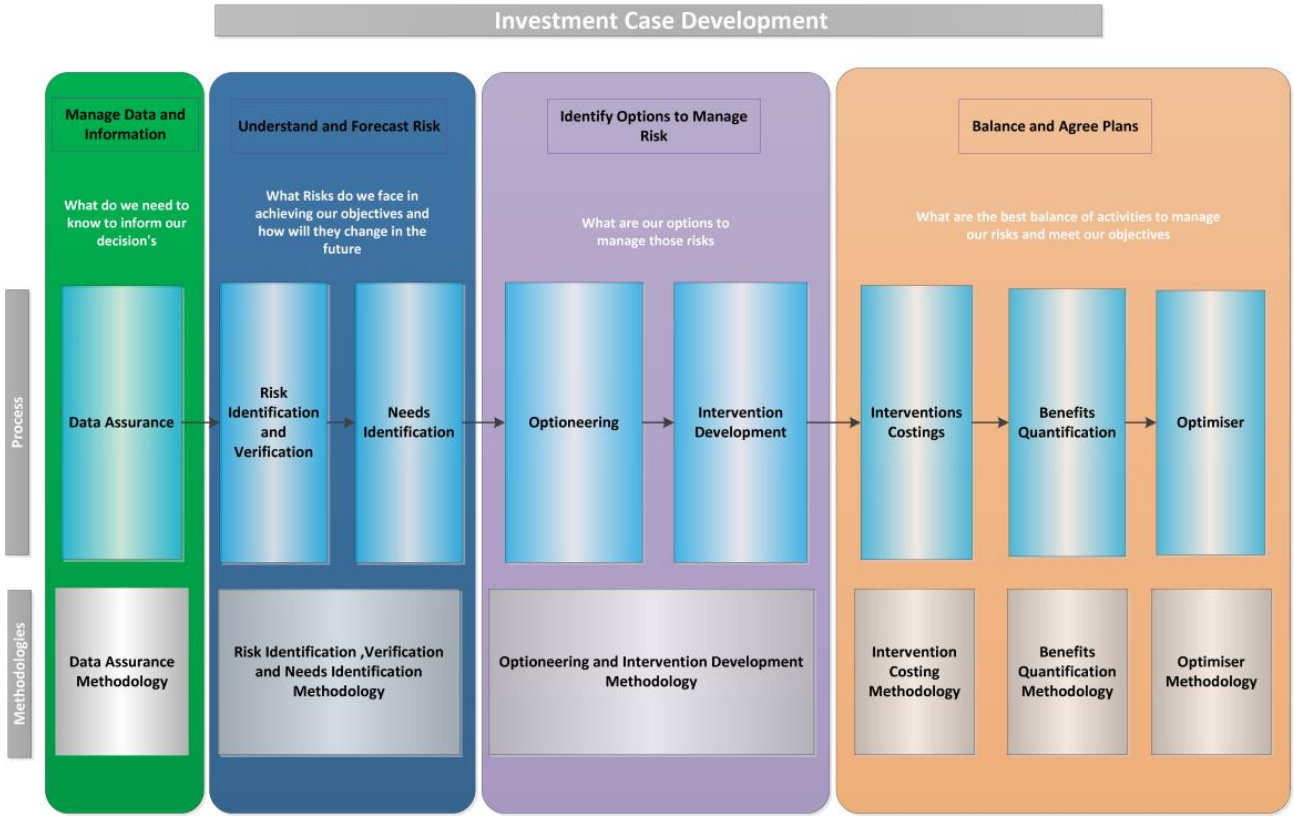


Figure 16 Investment case assurance methodology - level 1 diagram

The methodologies that have been used to develop the fully costed and optimised interventions within each investment case are described in Table 6 below. The methodologies are an Appendix to the PR19 Investment Cases Summary Document, which can be found in Technical Annex C5B.

Process	Description
Data Quality Assurance Methodology	The process of assuring data used throughout the development of the investment case.
Risk Identification, Verification and Needs Identification	The process of determining whether a risk is valid and requires consideration for AMP7 mitigation. Identification of the actual need(s), in terms of impact on the customer, performance commitments and cost.
Optioneering and Intervention Development	The process of developing potential options and subsequently interventions, which mitigate a risk(s). Considers the level of mitigation that an intervention provides, aligned to the customer and performance commitments.

Process	Description
Data Quality Assurance Methodology	The process of assuring data used throughout the development of the investment case.
Intervention Costing	The process of developing costs for individual interventions. Describes the interdependencies and control points relating to intervention cost development.
Benefits Quantification	The process of defining and assessing benefits attributable to individual interventions, in terms of contribution to achieving performance enhancement aligned to performance commitments.
Optimisation	The assessment and selection of interventions using constrained scenarios. Establishes the ranking of interventions in terms of improving performance/achieving pre-determined performance commitment targets at optimal cost.

Table 6 Investment case development process stages

We developed a number of scenarios utilising this process and when we engaged our customers we consulted on a slower improvement plan, suggested improvement plan and a faster improvement plan.

As a result of adopting this process the Water Network Plus investment plan has been developed through the creation of investment cases to outline the investment required in AMP7 within specific asset groupings.

6.3 Our investment plans

6.3.1 Investment case summary

The investment cases group together similar asset types, ensuring that all asset types are considered and there is no duplication. There are 21 investment cases in total, 14 of which are allocated to Water Network Plus in entirety, as shown in Figure 17 below.

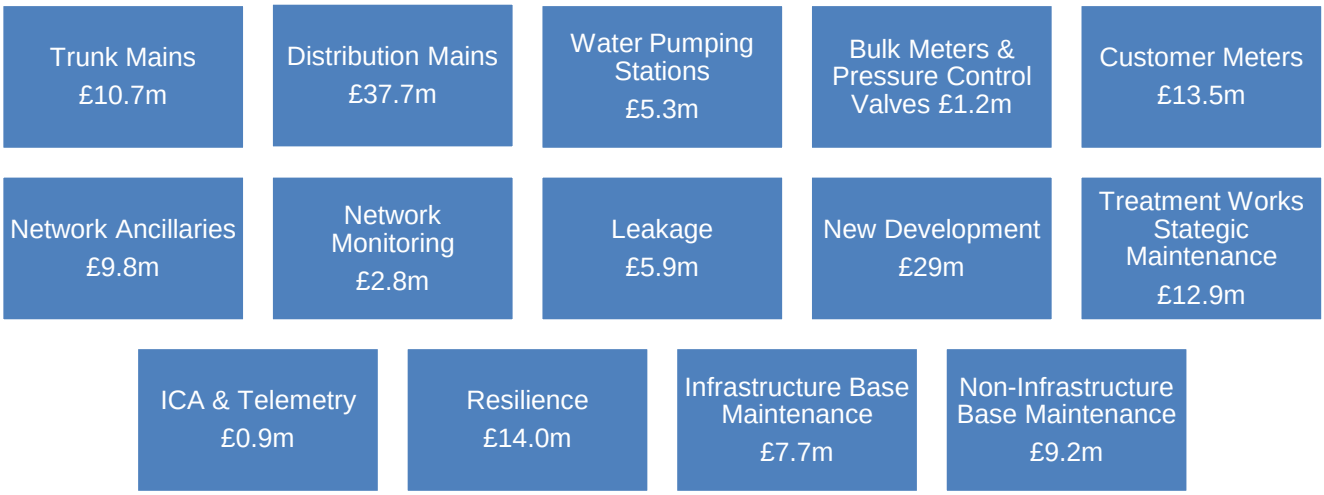


Figure 17 Water Network Plus investment cases

Four investment cases have a partial contribution to Water Network Plus and a partial contribution to Water Resources. These are:

- Information technology (total capital investment £16.127m, of which £14.795m (91.7%) is allocated to Water Network Plus);
- Management and general (total capital investment £13.905m, of which £10.989m (79.0%) is allocated to Water Network Plus);
- Raw water distribution (total capital investment £0.253m, of which £0.136m (53.8%) is allocated to Water Network Plus); and
- Water resources (total capital investment £8.026m, of which £0.946m (11.8%) is allocated to Water Network Plus).

The remaining two, Raw Water Pumping Stations and Environment are aligned solely to the Water Resources Business Plan (more detail can be found in Section B1 of our business plan).

In order to deliver customer priorities, outcomes and associated performance commitments described earlier, we plan to invest a pre-efficiency £212m, during the AMP7 period. There will be contributions of £15m by others such as developers. Of this investment, Water Network Plus is £189.6m and £174.4m net of grants and contributions.

As part of this investment we will deliver 192 interventions. Including, for example; refurbishment of our deteriorating assets; 100km of trunk and distribution pipe replacement; installation of circa 40,000 meters and replacement of cicra 66,000 meters; and installation of pressure management equipment and intelligent valves. Table 7 outlines the pre-efficiency investment both at control and business unit allocation level.

Wholesale Control	**Water Resources**	**Water Network Plus**				**Total (Pre-Efficiency)**
Business Unit Allocation	***01 Water Resources***	***02 Raw Water Distribution***	***03 Water Treatment***	***04 Treated Water Distribution***	**Total Water Network Plus**	
Total Investment (%)	**11.6%**	**0.5%**	**13.7%**	**74.2%**	**88.4%**	**100%**
Total Investment	**£22.904m**	**£0.931m**	**£27.043m**	**£146.466m**	**£174.441m**	**£197.345m**
Maintaining the long term capability of the assets - infra	£3.612m (1.8%)	£0.136m (0.1%)	£0m (0%)	£65.291m (33.1%)	**£65.427m**	**£69.039m (35%)**
Maintaining the long term capability of the assets - non-infra	£11.575m (5.9%)	£0.795m (0.4%)	£26.543m (13.5%)	£40.950m (20.8%)	**£68.288m**	**£79.863m (40.5%)**
Other capital expenditure - infra	£2.765m (1.4%)	£0m (0%)	£0m (0%)	£38.129m (19.3%)	**£38.13m**	**£40.895m (20.7%)**
Other capital expenditure - non-infra	£4.952m (2.5%)	£0m (0%)	£0.500m (0.3%)	£12.879m (6.5%)	**£13.379m**	**£18.331m (9.3%)**
Infrastructure network reinforcement	£0m (0%)	£0m (0%)	£0m (0%)	£4.329m (2.2%)	**£4.329m**	**£4.329m (2.2%)**
Grants & contributions	£0m (0%)	£0m (0%)	£0m (0%)	-£15.112m (-7.7%)	**-£15.112m**	**-£15.112m (-7.7%)**

Table 7 Investment expenditure by control and business unit

Through our continued transformation we have challenged ourselves and we have put forward a low-cost plan aimed at meeting customer expectations and applied an 8% efficiency challenge to its delivery. These efficiencies are delivered from 2020, as we prefer to consider our bottom up efficiency challenge from our current transformation plans rather than relying on a future "frontier shift", acknowledging that this is more challenging to deliver. As a result our post efficiency investment in Water Network Plus is £174.4m and £160.5m net of grants and contributions. Further explanation of our efficiency can be found in Section 7 of this document.

We have included a high level summary of a sample of our investment cases for Water Network Plus control in the following sections. More detail on these and the remaining investment cases can be found in supporting evidence Section C5 – Cost & Efficiency.

6.3.2 Trunk Mains

Wholesale Control	Water Resources	Water Network Plus			Total
Business Unit Allocation	*01 Water Resources*	*02 Raw Water Distribution*	*03 Water Treatment*	*04 Treated Water Distribution*	
Investment Case Contribution (%)	0%	0%	0%	100%	100%
Investment Case Contribution (£)	£0.176m	£0.016m	£0.257m	£10.283m	£10.732m

Table 8 Trunk Mains investment case mapped to Wholesale Control and Business Unit allocation

In order to provide customers with a safe and reliable supply, we will focus our investment in:

- **Strategic valve and hydrant replacement and improving access to and monitoring of critical trunk mains in order to reduce supply interruptions;**
- **Slip-lining of trunk mains in order to reduce appearance contacts; and**
- **Investment in improving the safety of our pipe bridge assets.**

We will achieve this by investing £10.7m to install or renew 12.5km of trunk mains, and to provide 46% of our supply interruptions performance improvement and 10% of our improvement on customer contacts about water quality – appearance.

Our extensive customer engagement programme has identified that customers want us to avoid supply interruptions, particularly when they last a long time and are unexpected, and to provide safe, good quality water at all times. The appearance of water is a consistent top priority across all our customer research and engagement.

Our strategy for trunk mains is to maintain a risk level within the network that translates into a stable and acceptable level of service for customers. We also need to ensure that planned investment is sufficient for routine and reactive maintenance to ensure the continued provision of high quality water to our customers and the continuation of business as usual activities.

By 2020 we will have reduced average supply interruptions to 12.2 minutes per property. Through our engagement programme customers have told us that they are willing to pay for a performance improvement of 85% to achieve 1.8 minutes per property by the end of 2025. Similarly customers are

willing to pay for an improvement in the appearance of water from 0.93 appearance contacts per 1,000 population by 2020 to 0.43 per 1,000 population by 2025.

6.3.3 Distribution Mains

Wholesale Control	Water Resources	Water Network Plus			Total
Business Unit Allocation	*01 Water Resources*	*02 Raw Water Distribution*	*03 Water Treatment*	*04 Treated Water Distribution*	
Investment Case Contribution (%)	0%	0%	0%	100%	100%
Investment Case Contribution (£)	£0	£0	£0	£37.694m	£37.694m

Table 9 Distribution Mains investment case mapped to Wholesale Control and Business Unit allocation

In order to provide customers with a safe and reliable supply we will:

- **Targeted mains replacement;**
- **Zonal mains renewal;**
- **Improved risk mitigation during planned works;**
- **Deployment of "rapid reaction team" in response to burst events; and**
- **Planned Flushing Programme.**

We will achieve this by investing £37.69m, installing 87.5km distribution mains to provide 34% of our supply interruptions performance improvement, 95% of our mains bursts improvement, 7% of our leakage improvement, and 83% of our improvement on customer contacts about water quality – appearance.

Our long-term ambition, as presented in ***Bristol Water … Clearly***, commits to maintaining the long-term health of our assets; improving long term health as we deliver the service improvements that customers' value.

At July 2018 we currently have 5,975km of distribution mains, of which 3,833km are unlined ferrous or asbestos cement mains, the most likely to burst and lead to supply interruptions. We are forecasting that we will have reduced this length by 89km by 2025, a 2.3% reduction. This is a sustainable rate of replacement to maintain our distribution mains assets, supported by our deterioration models.

This investment will result in a reduction in interruptions to supply which is of high importance to our customers. Willingness to pay assessments has shown strong support for financing initiatives to improve this service aspect. Our aim in AMP7 is to achieve a significant reduction in interruptions from an end of AMP6 level of 12.2 minutes to 1.8 minutes at the end of AMP7.

Alongside this improvement comes a reduction in bursts of 5 bursts per 1000 km, more than overcoming the current natural burst rate.. In addition, the planned work improves the network health and subsequently contributes a small but useful leakage reduction of just over 0.5 Ml/d.

Also of significance to customers is the appearance of water. We plan to reduce contacts per 1,000 customers from 0.93 to 0.43 in AMP7.

It is clear therefore that our plan for distribution mains provides a major contribution to some of the most important service improvements required and supported by our customers. The proposed length of mains affected by the plans is of a similar value to that for the AMP6 period.

6.3.4 Customer Meters

Wholesale Control	Water Resources	Water Network Plus			Total
Business Unit Allocation	*01 Water Resources*	*02 Raw Water Distribution*	*03 Water Treatment*	*04 Treated Water Distribution*	
Investment Case Contribution (%)	0%	0%	0%	100%	100%
Investment Case Contribution (£)	£0	£0	£0	£13.469m	£13.469m

Table 10 Customer Meters investment case mapped to Wholesale Control and Business Unit allocation

In order to provide customers with the outcome of a Safe and Reliable Supply and deliver their priority of saving water before developing new supplies, we will focus on improving water efficiency and reducing water consumption. In conjunction with this we will also focus on ensuring that our meters are accurate to support accurate billing. We will achieve this by investing £13.5m, installing 39,864 new meters and 66,000 replacement meters. This will provide 84% of our meter performance improvement, as well as 26% of our per capita consumption improvement.

Our extensive customer engagement programme has identified that customers want us to save water before developing new supplies and that they consider water efficiency is a high priority for them as a means to ensure a resilient water supply in the long term.

During our work to develop out Water Resource Management Plan 2019, we have carried out an assessment of the likely population growth in the area we supply. This indicates that the population we serve will grow by 7% by 2025 and in order to meet this potential increase in demand we need to improve water efficiency and help customers reduce their water consumption.

By 2020 on average each person in our operating area will be consuming 142 litres of water per day (l/h/d) – Per Capita Consumption. Through our engagement programme customers have told us that they are willing to pay for a performance improvement of 5% (135l/h/d).

Along with water efficiency, customer education and leakage management, metering is a key enabler to achieving a reduction in water demand because it provides the customer with a personalised water bill and places their bill within their control. Metered water supplies also mean that we can engage more effectively with consumers about their water consumption because there is a direct financial benefit to customers who are able to reduce the amount of water they use.

At July 2018 we currently have 266,000 customer meters and we are forecasting that we will have 338,100 in 2020 at the end of the current review period. This is an ambitious target installing over 70,000 meters and we will be investing circa £23.3m, to achieve this. A key feature of our success is the meter ‘Options’ programme which is our programme to promote the benefits of meters and install meters free of charge at the request of customers. We will also be investing circa £1.2m in replacing over 25,000 existing meters in AMP6 to ensure our customers receive accurate bills.

6.3.5 Leakage

Wholesale Control	Water Resources	Water Network Plus			Total
Business Unit Allocation	*01 Water Resources*	*02 Raw Water Distribution*	*03 Water Treatment*	*04 Treated Water Distribution*	
Investment Case Contribution (%)	0%	0%	0%	100%	100%
Investment Case Contribution (£)	£0	£0	£0	£5.910m	£5.910m

Table 11 Leakage investment case mapped to Wholesale Control and Business Unit allocation

In order to provide Local Community and Environmental Resilience, and deliver their priority of saving water before developing new supplies, we will focus on reducing leakage. We will achieve this by investing in continued active leakage control and pressure management at a totex of £27.1m (of which £5.9m is capital expenditure) to provide 84% of our leakage performance improvement.

We have completed an extensive customer engagement programme that has identified that customers want us to save water before developing new supplies, when considering the long-term supply resilience requirements within our operating area.

Reducing leakage is a key strand in our strategy for achieving this customer priority. We have committed to reducing leakage by 15% in AMP7.

Managing leakage and water usage is important for delivering a resilient network in the long term and avoiding over abstraction of our water resources. Our Water Resources Management Plan indicates that demand management, including reducing leakage will achieve the supply-demand balance.

Through our engagement programme customers have told us that they would like to see leakage driven lower, and willingness to pay for leakage reduction is high when compared with other options for water resource management.

We will therefore invest to transition from our AMP6 target outcome leakage levels of 43Ml/d down to the end of AMP7 target of 36.5Ml/d – a reduction of 15%.

We have engaged RPS Environmental Management Ltd (RPS) to undertake studies to identify the optimal interventions necessary to drive leakage down to this target level. The identified interventions are:

- Active leakage control;
- Find and fix based on a continuation of current policy; and
- Pressure management.

In addition to these interventions we must continue with all of our existing leakage control activities to prevent leakage from growing. Our totex investment therefore covers the investment needed to hold leakage at current levels and that need to transition to target levels.

We are planning to spend a totex of £27.1m on leakage. Of this value:

- £18.4m will be spent on finding and repairing leaks to sustain leakage at 43 Ml/d for the AMP7 period;
- £5.6m will be spent to reduce leakage by 15% from the end of AMP6 target. This is the cost to transition from 43 Ml/d at the end of AMP6 to 36.5 Ml/d by the end of AMP7; and
- £3.1m will be spent to maintain our reporting infrastructure such as loggers, meters and pressure reducing valves, and on systems and studies to help improve understanding of the performance of the network so that leakage can be better identified

6.3.6 Resilience

Wholesale Control	Water Resources	Water Network Plus			Total
Business Unit Allocation	***01 Water Resources***	***02 Raw Water Distribution***	***03 Water Treatment***	***04 Treated Water Distribution***	
Investment Case Contribution (%)	0%	0%	0%	100%	100%
Investment Case Contribution (£)	£0	£0	£0	£13.974m	£13.974m

Table 12 Resilience investment case mapped to Wholesale Control and Business Unit allocation

This investment presents the proposed investment in order to provide customers with resilient water supply and deliver the outcome of a Safe and Reliable Supply. We will focus on enhancing the resilience of our critical mains. In conjunction with this we will also focus on ensuring that existing connectivity is fit for purpose to should the need arise for its use in an extreme event. We will achieve this by investing £13.97m, installing 14.9km of mains (550m of which is sliplining), 74 valves (including 34 intelligent dynamic valves), and 23 turbidity meters to achieve improved resilience for 542,886 people as well as 3% of our performance improvement in supply interruptions.

We have completed an extensive customer engagement programme that has identified that customers want us to keep water flowing to their taps, and that they have a safe and reliable supply.

Our long term ambition, as presented in ***Bristol Water … Clearly***, commits to improving the resilience of our supplies, with issues with one of our critical assets (e.g. one of our key pumping stations, service reservoirs or mains) not affecting more than 3,000 people for more than 24 hours in the long-term. Initial targets are to improve current resilience so that such events do not affect more than 10,000 people by 2030.

In AMP6 the resilience performance achieved as a result of investment will be 9,063 population in centres greater than 25,000 at risk from supply site failure (which is the risk of the loss of any individual water treatment works, pumping station or service reservoir affecting more than 25,000 people). This remaining population is located in Glastonbury and Street. Our AMP7 investment will address this remaining population. However, 832,886 people will still be at risk of losing supply if one of the mains serving them fails and is unable to be fixed for a 24 hour period. The population affected from an

individual main failing is no more than 150,270. Through our engagement programme our customers have told us that they are willing to pay for a performance improvement of 65% (542,886 people).

We are employing innovative approaches in the use of Dynamic Boundary Valves to enable us to react to severe disruption events automatically; mitigating our systems is to address the weak points in our critical mains infrastructure.

At July 2018 we have identified 81 critical mains, which if failed would affect customer centres greater than 10,000. These serve 832,886 people, 68.6% of the total population served and we are forecasting that we will have reduced this to 290,000 people at risk, or 23.9% of the total population served by 2025, with all remaining customers in groups of 10,000 or greater being protected by 2030.

6.3.7 Benefits of our plans

We have carried out a full benefits quantification process for all proposed investments; our updated processes and systems allow us to understand the impact of performance at intervention levels.

Our Water Network Plus investment directly affects 11 of the 26 performance commitments and enables many of the others. An explanation of how we will achieve the remaining 15 is given in our supporting evidence Section C3 – Delivering Outcomes for Customers. For the 11 performance commitments that are delivered through investment, we have summarised the performance commitments at investment case level in Table 13 below:

Investment Case	Water quality compliance	Supply interruptions	Leakage	Mains Bursts	Unplanned outage	Customer contacts about water quality – appearance	Meter penetration	Properties at risk of receiving low pressure	Per Capita Consumption	Unplanned maintenance – non-infrastructure	Population at Risk from Asset Failure
Bulk Meters and PRVs			1.49%								
Customer Meters							83.78%		26.43%		
Distribution Mains		33.65%	7.33%	94.80%		83.17%					
ICA and Telemetry		0.24%									
Leakage			84.05%								
Network Ancillaries	0.00%		3.79%								
Network Monitoring		13.68%	3.13%	4.48%		6.35%		21.6%	0.29%		
New Development Expenditure							16.22%				

Investment Case	Water quality compliance	Supply interruptions	Leakage	Mains Bursts	Unplanned outage	Customer contacts about water quality – appearance	Meter penetration	Properties at risk of receiving low pressure	Per Capita Consumption	Unplanned maintenance – non-infrastructure	Population at Risk from Asset Failure
Resilience		2.78%									100.0%
Treated Water Pumping Stations		3.28%						78.4%		7.30%	
Treatment Works Strategic Maintenance	0.00%									15.20%	
Trunk Mains	47.90%	46.37%	0.21%	0.72%		10.48%				0.00%	
% Contribution to Performance Target	**47.90%**	**100.0%**	**100.0%**	**100.0%**	**n/a**	**100.0%**	**100.0%**	**100.0%**	**26.71%**	**22.50%**	**100.0%**

Table 13 Investment cases mapped to performance commitments

For these eleven we will not achieve the required performance improvement through investment alone. The description of how we will achieve the entire target level for each performance commitment is described below.

- **Water Quality Compliance:** Approximately half of our performance improvement for AMP7 will be achieved through investment in trunk mains; treatment works strategic maintenance and network ancillaries. We will achieve the remaining performance improvement by enhancing management of our assets, reducing risk with proactive interventions (such as flushing mains), and improving operational procedures to quickly resolve problems
- **Unplanned Outage:** Our AMP7 target for unplanned outage is to sustain our 2019/20 performance level of 1.74%. Our investment in raw water pumping stations, treatment works strategic maintenance and instrumentation, control, automation, and telemetry will support our ability to sustain this level of performance
- **Per Capita Consumption:** In total 26.71% of performance improvement is achieved through interventions within investment cases. The remaining performance improvement will be achieved as a result of a wider customer education programme.
- **Unplanned Maintenance – Non-Infrastructure:** Our investment cases contribute 23.24% towards our AMP7 target. We will achieve the remaining performance improvement through our day-to-day operational maintenance activities.

Some of our investment plans do not contribute directly to performance commitments but are key enablers to ensure excellent service for our customers and efficient delivery of our business. Two such examples are our management and general costs investment case and our information technology investment case.

- **Management and General:** This investment case has a range of enabling activities; areas such as investment to manage our deteriorating fleet of vehicles, preparations for PR24, health and safety, security and building investments. In total there are 31 improvement and compliance initiatives that will ensure our organisation has the necessary capabilities to deliver on behalf of our customers.
- **Information Technology:** An organisation's information technology capability needs to be flexible to service different needs and provide greater insight to support improved ways of working leading to greater service and efficiency. Where practical, development of the changes required to meet our customers priorities within our current information technology landscape have been designed into the solutions.

6.4 Developer services

We have a dedicated team which is responsible for processing applications from developers, self lay providers and new appointment and variation for our services.

The New Connections market has undergone transformation within the last 5 years to promote further competition in the market place and bring about improvements in the service provision of non-contestable works.

We are currently in a growth period with mains requisitions remaining static with the increase being picked up by the self lay market.

We have worked to create a closer working relationship with developers and self-lay providers. As part of this approach, we have reviewed all the available insight from developers and self lay providers to present a clear understanding of their priorities and perceptions of our performance.

We introduced our Market Engagement Days in 2017; the engagement events brought together developers and self-lay providers to build relationships, communicate information, and receive feedback. Through the events we have engaged on D-Mex, our new charging mechanisms, site issues, retail separation and also held a session to gain insight on our new website and what they would like to see. Responding to feedback on visibility of actions, we have ensured that feedback newsletters were issued to all developers and self lay providers. The newsletters that we issued summarised what we took away from the day, how we plan to use the information and provided a feedback loop to answer any outstanding queries.

This on-going dialogue has resulted in the following changes:

- Plans to introduce a developer and self lay providers portal; which will provide notifications on the status of jobs;
- To provide a better website with improved information, clear processes and timescales;
- Clear online forms which are easy to understand and complete;

- We are exploring the idea of combining quotations for mains and services;
- We aim to send CAD drawings and a summary sheet for clearer communication; and
- We are committing to continuing with our Market Engagement Days to keep evolving our ideas and customer experience.

In preparation of the new D-Mex for developers and self lay providers we are part of an industry working group which will review the current D-Mex pilot to ensure that developers and self lay providers have a measure that is appropriate and meets their needs.

Predicted workload is expected to increase in line with the Government's target to build 300,000 new homes per annum. We currently have several large developments notably Weston Airfield and Filton Airfield delivering new homes as part of the Government's target.

Data table App28 shows our developer services income proposals. Residential new connections are forecast to grow by circa 28,000 over 2020-25, compared to 22,500 over 2015-20, reflecting the impact of economic growth in the area and government policy to accelerate house building. New business connections are expected to be circa 250 per annum.

Network reinforcement expenditure is expected to amount to circa £4m over 2020-25, which is lower than the £5m in 2017-18 with the completion of the Southern Resilience Scheme which provides for growth towards Weston-super-Mare. This reflects that growth has been enabled across the region by our past resilience investment, and that reducing leakage and supporting water efficiency also provides capacity for new developments.

Contributions of £14m are expected against a total new development cost of £29m. The scale of self lay within the region (c.35% of forecast new connections for all services) means that infrastructure charges are likely to be negative in total from 2020 (£12.5m over 2020-25), once the income offset of £21m is applied.

Our approach to the new developer charging arrangements provides a level playing field for self lay providers and new appointment and variation providers (both of whom are likely to expand operations given the nature of the development sites in the region).

For the developer services element of the Water Network Plus price control we set out four bands that vary with the level of contestable services provided and the income recovery. The infrastructure charge is negative in each band, reflecting the standardised approach to income offset set at 85% of the on-site mains costs as standard across developments, with there not been sufficient off-site network reinforcement expenditure to result in a net positive infrastructure charge. Effectively the current charging rules and approach mean we will be paying customers when they connect, which offsets their connection costs (or making an asset payment to self lay providers and new appointment and variation providers through this route, in addition to not incurring the contestable costs avoided). Therefore our approach to developers income for the price control has anticipated our approach to the new charging arrangements for developer services in place now (except done through on-site charges/asset payments to self lay or reducing bulk supply charges to new appointment and variation providers, with this then switched to an infrastructure charge 'payment' from 1 April 2020).

Band A reflects "single properties and multiple properties where connections to existing mains only required". The 16,153 (55%) of new properties are all provided with contestable services as the scale is

too small to make self lay providers and new appointment and variation providers activity viable, or the services are all contestable and the unit rate varying with volume is accurate for this band.

Band B reflects “2 -10 properties where connecting to new mains”, and covers 0.25% of new properties. It is a small scale band because this situation is unusual, but again this includes a mix of contestable and non-contestable services which we assume that we provide all of the activity.

Band C reflects “11 - 99 properties where connecting to new mains”, and reflects 14% of new properties. Around 80% of these sites are served by SLPs, in line with recent experience which we assume to continue.

Band D reflects “100+ properties where connecting to new mains”, and reflects circa 33% of new properties. We use the same self lay provider/ future new appointment and variation provider assumption as Band C as broadly both of these size bands are covered in the market.

The unit rates in Band B, C and D are very similar, although the non-contestable unit volume paid out with infrastructure charges is lower at circa £290 than the £438 in Band B and £429 in Band A because of the scale of activities with the self lay provider mix in the C and D bands.

The contestable unit rate in Band A is lower at £685 v circa £4,800 in Bands B, C and D due to the cost of on-site mains which is not required in Band A by definition.

6.5 Operational expenditure plan

This section sets out the details behind our Water Network Plus operating costs, which are based upon our expectations regarding the day-to-day requirements for the business and our own efficiency challenge.

We have considered our operating costs from the 2016/17 base opex expenditure and then considered changes from this base position, including to reflect 2017/18 where we considered to what degree efficiency assumptions were required to maintain what we believe to be an upper quartile level of efficiency for wholesale water, including Water Network Plus. We also considered input price pressure, impact of investment schemes and future efficiency. Full details are provided in Section C5 - Cost & Efficiency, which also describes our transformation project which will embed much of this efficiency, and the ability to deliver the stretching outcome incentives described above, in advance of 2020. The end result is an operating expenditure forecast for 2020-25 of £215.4m.

We have challenged ourselves to evidence any adjustments we have identified in our forecast expenditure and only included items strictly necessary and which had strong evidence and support. Other areas where there is uncertainty are considered, either through the overall scope of efficiency we assume in our plan, or through the specific cost risks identified. There are relatively few specific cost risks, and these are set out as part of the RORE analysis in Section C6 - Financing, Affordability and Risk and Return.

The main costs risks not included in our cost base related to highway permitting schemes of circa £1.0m per annum, based on a recent Government recommendation to local authorities requiring implementation of such a scheme. Our only other specific Water Network Plus wholesale cost risks relate to specific decisions we make, such as not including the full cost of a Drinking Water Inspectorate supported scheme at Cheddar Water Treatment Works (slow sand filter covers), as the recent weather means we prefer to keep the investigation ongoing into AMP7. We then, with an appropriate (assumed

50%) cost sharing rate, carry the risk of the expenditure being required until 2025, rather than including in price limits and returning investment not required after the event.

Water Network Plus opex costs

The calculation is set out below, with each line in Table 14 below then being explained in further detail in the following sections.

Water Network Plus	2020/21	2021/22	2022/23	2023/24	2024/25	AMP 7
Base opex 17/18 actuals	41.3	41.3	41.3	41.3	41.3	206.4
Base Adjustments	0.1	0.1	0.1	0.1	0.1	0.3
Adjusted opex 17/18 actuals	**41.3**	**41.3**	**41.3**	**41.3**	**41.3**	**206.7**
Opex Impact of Amp7 Investment Plan	0.7	0.2	(0.0)	(0.3)	(0.4)	0.1
Amp6 Additional ALC	0.7	0.7	0.7	0.7	0.7	3.5
New Connections (17/18)	0.3	0.4	0.5	0.6	0.7	2.5
Business Retail Cost Moving to Wholesale	0.7	0.7	0.7	0.7	0.7	3.3
Total Opex Pre IPP and Efficiency	**43.7**	**43.3**	**43.2**	**43.0**	**43.0**	**216.1**
Input price pressure (above CPIH)	2.3	3.1	3.8	4.6	5.4	19.2
Efficiency	(2.9)	(3.2)	(3.5)	(3.8)	(4.1)	(17.3)
Total	**43.1**	**43.2**	**43.5**	**43.9**	**44.3**	**218.0**
Principle Asset Usage Adjustment	(0.4)	(0.5)	(0.6)	(0.6)	(0.5)	(2.6)
Total Post Adjustment	42.7	42.6	43.0	43.3	43.8	215.4

Table 14 Water Network Plus opex costs

Water Network Plus: Base totex 2017/18 Actuals

Our base Water Network Plus totex is taken from 2017/18 actuals and represents our most recent financial figures to ensure the plan reflects our current cost levels. These figures, shown in Table 15, are similar to that of WS1 / 4D.

Water Network Plus Base Opex	2020/21	2021/22	2022/23	2023/24	2024/25	AMP 7
Power	6.8	6.8	6.8	6.8	6.8	34.0
Income treated as negative expenditure	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)
Abstraction Charges / Discharge consent	0.1	0.1	0.1	0.1	0.1	0.5
Bulk supply	0.1	0.1	0.1	0.1	0.1	0.6
~ Renewals expensed in year (Infrastructure)	1.9	1.9	1.9	1.9	1.9	9.5
~ Renewals expensed in year (Non-Infrastructure)	0.0	0.0	0.0	0.0	0.0	0.0
~ Other operating expenditure excluding renewals	27.5	27.5	27.5	27.5	27.5	137.7
Local authority and Cumulo rates	3.5	3.5	3.5	3.5	3.5	17.6
Total expenditure excluding third party services	40.0	40.0	40.0	40.0	40.0	199.9
Third party services Opex	1.3	1.3	1.3	1.3	1.3	6.5
Total Base Opex expenditure	41.3	41.3	41.3	41.3	41.3	206.4

Table 15 Water Network Plus base opex

These components of base Water Network Plus actuals are summarised as follows:

- **Power:** one of the larger cost elements within the business, Water Network Plus makes up 78% of our overall power spend;
- **Income treated as negative expenditure:** typically shows credits relating to power;

- **Abstraction Charges / Discharge consent:** The majority of this resides within Water Resources with only 3% of the cost in Water Network Plus;
- **Bulk supply:** 87% of this cost hits Water Network Plus and relates to a minor supply of treated water from Wessex Water;
- **Renewals expensed in year (Infrastructure):** 88% of this cost hits Water Network Plus and relates to the infrastructure maintenance programme;
- **Renewals expensed in year (Non-Infrastructure):** No cost historically or expected;
- **Other operating expenditure excluding renewals:** 83% of this cost hits Water Network Plus;
- **Local authority and Cumulo rates:** This line is made up of cumulo business rates (allocated between Water Network Plus and Water Resources) and allocation of office rates with 73% of this cost allocated to Network Plus; and
- **Third party services Opex:** 84% of this cost hits Water Network Plus, and relates to the cost of providing third party services. Changes to reflect an additional amount of revenue and opex in the 2017/18 base are shown below.

Water Network Plus: Base Opex Adjustments

These adjustments, shown in Table 16, remove one-off items which we would not expect to reoccur in future years. This removes the impact of one off credits (*Income treated as negative expenditure and ~ Renewals expensed in year (Infrastructure)*) and aligns our third party rechargeable costs to historic levels which is consistent with related revenue assumptions (*Third party services Opex*). The net impact is a small uplift to the base of £0.06m per annum, £0.3m for the AMP.

Water Network Plus Base Opex Adjustment	2020/21	2021/22	2022/23	2023/24	2024/25	AMP 7
Income treated as negative expenditure	0.0	0.0	0.0	0.0	0.0	0.1
~ Renewals expensed in year (Infrastructure)	0.3	0.3	0.3	0.3	0.3	1.3
Total excluding third party services	0.3	0.3	0.3	0.3	0.3	1.4
Third party services Opex	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(1.0)
Total Base Opex Adjustments	0.1	0.1	0.1	0.1	0.1	0.3

Table 16 Water Network Plus base opex adjustments

Water Network Plus: Opex impact of AMP7 Investment Plan

We will be undertaking further investment in AMP7 in order to keep delivering an efficient and effective service. As a result there will be an impact on overall opex spend. These costs/credits have been added to our forecast. They are minor in nature for individual investment schemes, and are described in each investment case. They include additional costs from metering, savings in water from water efficiency and savings from catchment management on the cost of water treatment. The main allocation is for active leakage control which increases opex repairs to reduce leakage to a new level, offset by efficiencies driven by IT investment on a whole life totex basis. The details are set out in the individual investment cases. A summary is provided in Table 17 below.

Water Network Plus Opex Impact of Amp7 Investment Plan	2020/21	2021/22	2022/23	2023/24	2024/25	AMP 7
Power	0.0	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)
~ Other operating expenditure excluding renewals	0.7	0.2	(0.0)	(0.2)	(0.3)	0.3
Total Opex Impact of Amp7 Investment Plan expenditure	0.7	0.2	(0.0)	(0.3)	(0.4)	0.1

Active leakage control to reduce leakage in AMP7	£1.9m
Customer side "leak stop" repairs	£0.6m
Network monitoring logger (e.g. batteries)	£0.6m
Reduction of customer minutes lost	£0.6m
Other Items	£0.5m
Environmental Performance	(£0.1m)
Consolidation of resources	(£0.1m)
Customer analytics	(£0.2m)
Alderley cryptosporidium membrane – self cleaning	(£0.3m)
Monitoring of Resource Usage	(£0.5m)
Internal Process Improvement	(£0.6m)
IT investment and upgrade benefits to existing services	(£1.4m)
Total	**£0.1m**

Table 17 Water Network Plus: opex impact of AMP7 investment plan

Water Network Plus: AMP6 Additional Opex Spend - Active Leakage Control

The opex impact of any capital schemes delivered in AMP6 which are not captured in our base year will not be fully reflected in the 2017/18 base opex.

Our Active Leakage Control scheme from AMP6 was identified as the only material addition include. In this AMP, we have made capital investments in our leakage management to raise performance. Once AMP7 commences, the leakage performance level and associated resources will be considered business as usual. This resource cost will then become opex as it maintains the performance level reached (note for further improvements to meet our AMP7 leakage targets, we have a complementary investment scheme).

The amounts shown in Table 18 below reflect the ongoing active leakage control cost having reduced leakage by 12% over 2015-20.

Water Network Plus AMP6 Additional ALC	2020/21	2021/22	2022/23	2023/24	2024/25	AMP 7
~ Renewals expensed in year (Infrastructure)	0.7	0.7	0.7	0.7	0.7	3.5
Total AMP6 Additional ALC expenditure	0.7	0.7	0.7	0.7	0.7	3.5

Table 18 Water Network Plus: AMP6 additional opex spend - Active Leakage Control

Water Network Plus: Additional Opex from New Connections

As our customer base grows so will our cost base. Therefore by taking easily identifiable costs (from 2017/18) which have a strong correlation to underlying volumes we have generated a unit cost per population (WS3 figures). These are power (related to Water Treatment/Treated water distribution) and materials and consumables (related to Water Treatment/Treated water distribution) which is shown as "other" in Table 19 below. This figure excludes labour and infrastructure enhancements on the basis that these are not as strongly correlated with the increasing population. This figure was then multiplied by the forecast population increase as per WS3 and generated our additional opex from new connections. The benefits of metering and water efficiency are included within the overall investment programme impact shown separately which helps to offset these costs.

Water Network Plus New Connections	2020/21	2021/22	2022/23	2023/24	2024/25	AMP 7
Power	0.2	0.3	0.3	0.4	0.5	1.7
~ Other operating expenditure excluding renewals	0.1	0.1	0.2	0.2	0.2	0.8
Total New Connections expenditure	0.3	0.4	0.5	0.6	0.7	2.5

Table 19 Water Network Plus: additional opex from new connections

Water Network Plus: Business Retail Cost Moving to Wholesale

With effect from 1st April 2017 we exited the Business retail market. However an element of these costs remained in the business. These have been allocated by two different approaches:

- AMP 6 Approach - Retail Non-Household costs are excluded from Retail Household Reporting. These costs are also not included in Water Network Plus opex.
- AMP 7 Approach - Retail Non Household costs are no longer shown in retail and therefore must be reflected in Water Network Plus for the AMP. Based on 2017/18 numbers these costs were then posted to WS1 Line 7 and Line 8 Treated water distribution lines. This reflects retailing of developer services which forms part of the wholesale Water Network Plus price control for 2020-25, as well as other allocations including overheads. Please note the rates adjustment in line 8 is too small to show in the table below.

AMP7 Water Network Plus business retail cost moving to wholesale are summarised in Table 20.

Water Network Plus Business Retail Cost Moving to Wholesale	2020/21	2021/22	2022/23	2023/24	2024/25	AMP 7
~ Other operating expenditure excluding renewals	0.7	0.7	0.7	0.7	0.7	3.3
Total Business Retail Cost Moving to Wholesale	0.7	0.7	0.7	0.7	0.7	3.3

Table 20 Water Network Plus: business retail cost moving to wholesale

Water Network Plus: Input Price Pressure (Above CPIH)

We commissioned NERA Economic Consulting to produce a forecast of Real Price Effects (RPEs) above CPIH, ensuring our real input price inflation is built on cost pressures that comparable companies face.

This means our input price pressure is therefore based on published price and cost indices that are most relevant to explaining changes in the input prices we faces for labour, materials, plant and equipment, energy and other costs.

Input price pressure is applied based upon the forecast in the NERA report, which showed an average yearly uplift of 1.8% above CPIH. This value is applied equally across all cost lines (adjustments made for CPIH as required in AMP7). This is reflected in App24.

The calculation of input price pressures is summarised in Table 21. Any small differences in totals reflect the interaction with efficiency:

Water Network Plus Input cost pressure (above CPIH)	2020/21	2021/22	2022/23	2023/24	2024/25	AMP 7
Power	0.4	0.5	0.6	0.7	0.8	2.9
Abstraction Charges / Discharge consent	0.0	0.0	0.0	0.0	0.0	0.0
Bulk supply	0.0	0.0	0.0	0.0	0.0	0.0
~ Renewals expensed in year (Infrastructure)	0.1	0.2	0.2	0.3	0.3	1.2
~ Other operating expenditure excluding renewals	1.5	2.1	2.6	3.1	3.6	12.9
Local authority and Cumulo rates	0.2	0.3	0.3	0.4	0.5	1.6
Total operating expenditure excluding third party services	2.2	3.0	3.7	4.5	5.3	18.7
Third party services Opex	0.1	0.1	0.1	0.1	0.1	0.5
Total Input cost pressure (above CPIH)	2.3	3.1	3.8	4.6	5.4	19.2

Table 21 Water Network Plus: input price pressure (Above CPIH)

Water Network Plus: Efficiency

We looked within the business at how we could best optimise our current operation. This identified a number of potential areas from to which we could expect to make improvements. Some examples of this are solar panel Installations, gas power station installation, improvements in critical based maintenance, scheduling/optimisation of energy usage, procurement optimisation, process improvements and workforce productivity enhancement. These impact cost areas such as power, other operating expenditure excluding renewals and renewals expensed in year (infrastructure).

To ensure our target efficiency was of a sufficient level we commissioned NERA Economic Consulting to conduct a benchmarking exercise to identify Bristol Water's comparative efficiency position and on-going productivity improvements for the period to 2024/25.

This report was prepared on 2016/17 data (the most recent data available at the time), and indicated Bristol Water was 1% off upper quartile efficiency with the potential for on-going productivity improvements to offset this by 0.7% per annum. The Ofwat models suggested we were 2% more efficient than the upper quartile. Where are our expenditure is higher in 2017/18, we have targeted catch up efficiency savings in order to maintain what we believe to be an upper quartile level of efficiency.

We describe how these efficiencies will be delivered through the bottom up transformation analysis in Section C5 - Cost & Efficiency of our business plan.

The efficiencies break down into two components. We do not make a distinction in our bottom up planning between catch up and frontier shift in efficiency. Instead we use an integrated approach, identifying specific initiatives and then with a remaining cost challenge which reflects our frontier shift. The opex outcome which applies to both water resources and Water Network Plus is summarised in Table 22:

Water Network Plus Efficiency	2020/21	2021/22	2022/23	2023/24	2024/25	AMP 7
Power	(1.4)	(1.5)	(1.6)	(1.7)	(1.8)	(8.0)
Abstraction Charges / Discharge consent	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Bulk supply	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)
~ Renewals expensed in year (Infrastructure)	(0.1)	(0.2)	(0.2)	(0.2)	(0.3)	(1.0)
~ Other operating expenditure excluding renewals	(1.2)	(1.4)	(1.5)	(1.7)	(1.8)	(7.5)
Local authority and Cumulo rates	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.4)
Total operating expenditure excluding third party services	(2.8)	(3.1)	(3.4)	(3.7)	(4.0)	(17.0)
Third party services Opex	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.3)
Total Efficiency	(2.9)	(3.2)	(3.5)	(3.8)	(4.1)	(17.3)

Table 22 Water Network Plus: efficiency

Water Network Plus: Principal Use Recharge

A final adjustment was made for recharging of asset usage between Water Network Plus and Retail.

This is where assets principally used by Water Network Plus, (which therefore have their capex cost and depreciation recorded against Water Network Plus) will recharge part of this depreciation to reflect the proportion used by retail. Typical retail asset usage will include shared central IT systems, office and office equipment.

This cost as set out in Table 23, which is also shown on the recharge lines in table R1, is removed from WS1 - Line 7 - Other operating expenditure excluding renewals (in CPIH deflated terms).

Water Network Plus Principal Use Recharge	2020/21	2021/22	2022/23	2023/24	2024/25	AMP 7
~ Other operating expenditure excluding renewals	(0.4)	(0.5)	(0.6)	(0.6)	(0.5)	(2.6)
Total Principle Asset Usage Adjustment	(0.4)	(0.5)	(0.6)	(0.6)	(0.5)	(2.6)

Table 23 Water Network Plus: principal use recharge

Principle Asset Usage Adjustment

An adjustment was made for recharging of asset usage between wholesale and retail.

This is where assets principally used by wholesale, (which therefore have their capex cost and depreciation recorded against wholesale) will recharge part of this depreciation to reflect the proportion used the by retail. Typical retail asset usage will include shared central IT systems, office and office equipment. This cost which is also shown on the recharge lines in table R1 is removed from WS1 - Line 7 - Other operating expenditure excluding renewals (in CPIH deflated terms).

7 Cost and efficiency of our plan

7.1 Demonstrating efficiency

Our full information on cost and efficiency is provided in our separate Section C5 - Cost & Efficiency, with background and context provided in section A1 of our business plan

To inform our view of an appropriate efficiency challenge to set ourselves during 2020/21 to 2024/25 and beyond, we have benchmarked our costs and operations to other companies using a range of econometric approaches.

Both the most recent econometric cost benchmarking for the industry and our own analysis that we conducted which was carried out by NERA suggests that overall for water wholesale costs Bristol Water is at upper quartile of cost efficiency for the industry.

This is based on considering our water wholesale cost position as a whole. For our plan this reflects the integrated nature of wholesale services and the interdependency on water treatment with water resources costs in particular, as our planning approach considers costs as a whole, appropriate as we are not considering major new water resource schemes.

Based on analysis by NERA of the Ofwat form of cost models in the PR19 cost modelling consultation (based on 2011-2017 data), the improvement in Bristol Water cost efficiency can be seen. Looking at the average cost over the period, Bristol Water is above the upper quartile of industry efficiency (represented as 0% in Figure 18 below, with a positive number representing higher costs. Overall Bristol Water is circa 2% lower (more efficient) than the industry upper quartile 2016/17 costs. Therefore our current costs in 2016/17 have been used as the basis for our bottom up consideration of our cost base, in particular for operating and maintenance costs. On this basis therefore we expect our plan to be efficient. Our efficiencies have been updated to reflect the challenge from additional 2017/18 costs, particularly from the unusual weather events during the year, and to ensure customer do not pay for the cost of any performance targets that were not hit during 2017/18.

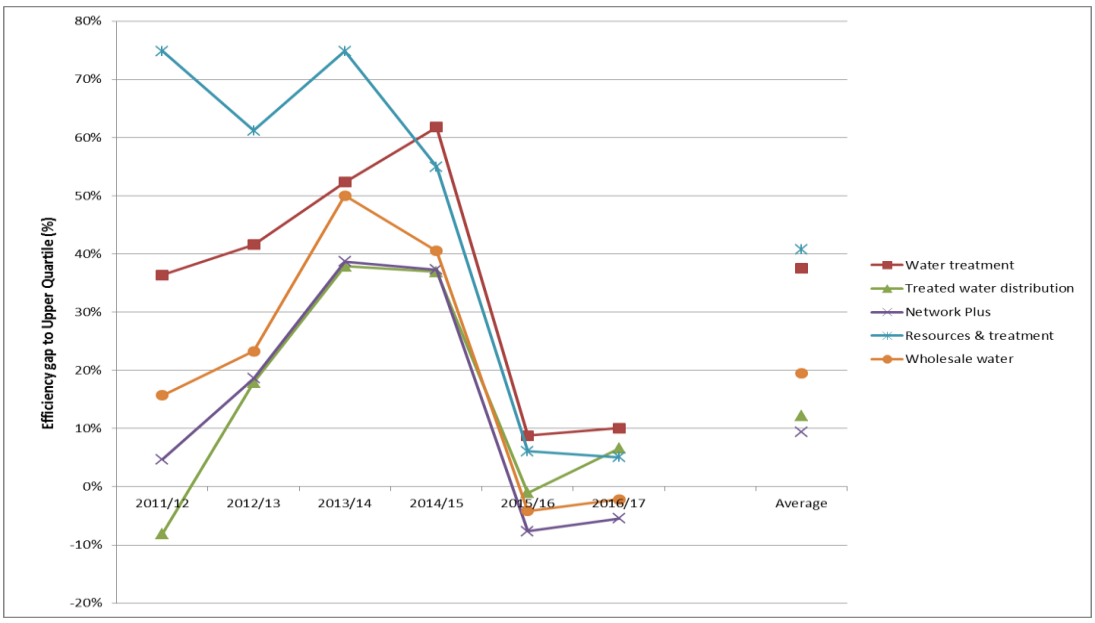


Figure 18 Our assessment of the efficiency gap

We have focussed our estimate of the current efficiency position on operations and base maintenance costs (known as botex). Most of our areas of enhancement investment are investigations, or improvements such as our supply resilience expenditure that are similar in nature to our maintenance expenditure. Industry information on unit costs, where available, were used to support our costing of other enhancement investments such as the water quality schemes, and this formed the basis for DWI support for these schemes, prior to us considering programme level efficiency challenges.

We do not propose any investments sufficient for direct procurement because there are no significant enhancement schemes are proposed during AMP7 and our proposals for water efficiency and leakage reduction are well below the proposed £100m whole life totex trigger point for consideration of direct procurement, we do not believe that this will be an issue of direct relevance to Bristol Water. Although this approach will of course be kept under review and if a direct procurement approach is identified that could bring benefits of affordability, efficiency or resilience to our customers then this will be a material consideration in our allocation of contracts in AMP7 and beyond.

Figure 19 below shows how we have progressively closed our efficiency gap, as assessed through NERA analysis of Ofwat's 2013/14 to 2016/17 four-year dataset.

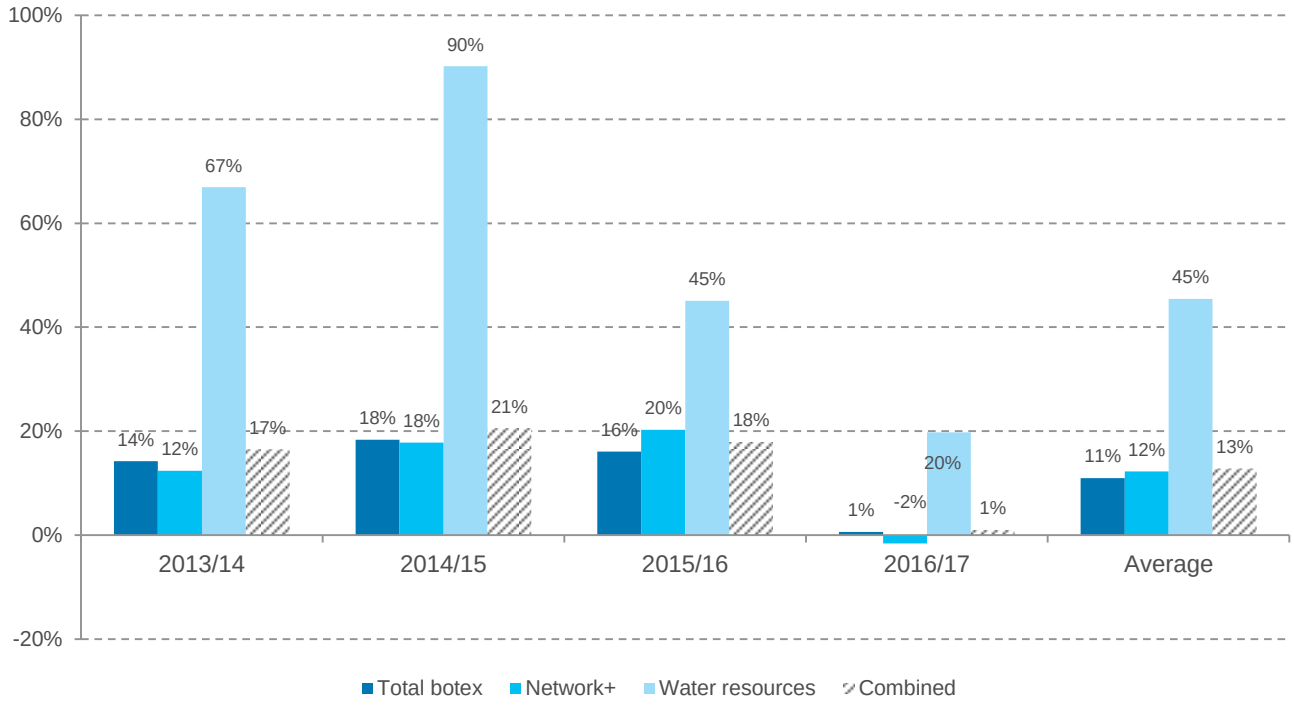


Figure 19 NERA models for Bristol Water: annual efficiency gaps 2013/14 to 2016/17

Although we have made significant improvements, we accept the need for further efficiency improvements in the future and we have therefore set up a Business Transformation Function to deliver further significant efficiencies as described in this document under "Delivering Efficiency". We realise that efficiency improvement is not a one-time target but an on-going process and although we anticipate significant frontier shift in the water industry in AMP7, our plan targets AMP7 upper quartile efficiency for our Wholesale activity throughout AMP7.

For wholesale capex our plan absorbs all of our forecast input price pressure above CPIH with a 0.9% per annum frontier shift as well as a 9% initial cost reduction. For wholesale opex cost, input price pressure above of 1.8% above CPIH is offset by 0.7% p.a. frontier shift of efficiency, as well as a 3% initial efficiency reduction.

Figure 20 below provides a full range of efficiency evidence that we have considered in developing our view of relative efficiency and our catch-up efficiency assumptions.

Models	Assessed Period Informing Efficiency Gap	Water Network Plus	Wholesale Water
Oxera Reproduction of Ofwat's PR14 models[24]	2008/09 to 2012/13		20%
Oxera Reproduction of Ofwat's PR14 models	2015/16		-11% to 1%
Oxera Reproduction of Ofwat's PR14 models	2013/14 to 2015/16		28% to 36%
Oxera Reproduction of CMA models	2013/14 to 2015/16		33% to 35%
Oxera Reproduction of CMA models	2015/16		-2% to 0%
Oxera's PR19 Industry Models for Bristol Water	2013/14 to 2015/16	20% to 29%	23% to 31%
Oxera's PR19 Industry Models for Bristol Water	2015/16	-12% to -26%	-4% to -12%
NERA reproduction of Ofwat's PR14 models[25]	2011/12 to 2016/17		27% to 32%
NERA reproduction of Ofwat's PR14 models	2011/12 to 2016/17		26% to 30%
NERA reproduction of CMA's PR14 unsmoothed models	2011/12 to 2016/17		32%
NERA reproduction of CMA's PR14 smoothed models	2011/12 to 2016/17		25% to 27%
NERA reproduction of Oxera's PR19 Industry Study models for Bristol Water	2011/12 to 2016/17	15% to 38%	23% to 44%
NERA's PR19 models for Bristol Water	2014/15 to 2016/17	12% (10% to 13%)	11% (10% to 13%)
NERA PR19 triangulated modelling	2014/15 to 2016/17		13%
NERA's PR19 models for Bristol Water	2016/17	-2%	1%
NERA Reproduction of Ofwat's PR19 consultation cost models[26]	2011/12 to 2016/17	9% (3%-25%)	20% (9%-32%)
NERA Reproduction of Ofwat's PR19 consultation cost models	2016/17	-5%	-2%

Figure 20 Efficiency evidence

[24] Oxera (2017) Preliminary view on Bristol Water's efficient level of botex
[25] NERA (2017) Comparative Benchmarking and Special Cost Factor Assessment
[26] NERA (2018) Reproduction of Ofwat's models published in the cost model consultation March 2018

Triangulated View		Assessed Period Informing Efficiency Gap	Water Network Plus	Wholesale Water
		2014/15 to 2016/17	12%	13%
		2016/17	-2%	1%
PR19 business plan botex costs – pre-efficiency	£m	2020/21 to 2024/25	371.9	452.9
Catch-up efficiency to upper quartile	£m	2020/21 to 2024/25	(7.4)	4.5
Adjusted for cost adjustment claims	£m	2020/21 to 2024/25	(18.3)	(27.7)
Overall efficiency gap (negative is outperformance)	£m	2020/21 to 2024/25	(25.7)	(23.2)
Plan efficiencies (Botex)	£m	2020/21 to 2024/25	(33.5)	(40.3)
Post efficiency Plan Botex	£m	2020/21 to 2024/25	338.4	412.6

Figure 21 Triangulated view

This table demonstrates that, depending on other companies subsequent changes in botex efficiencies, we have an expectation that the plan efficiencies of £33m build on a position around upper quartile to circa £26m, depending on model aggregation and relative special factor differences. Our plan assumptions therefore assume a lower frontier shift than would otherwise be the case, consistent with our customer preferences for an early reduction in bills, as well as the stretching performance targets in the plan.

Through our continued transformation we have challenged our current and likely future costs and have identified £33m of new botex efficiencies by 2025 (around 9%). We have put forward a low cost plan aimed at meeting customer expectations and applied an 8% efficiency challenge to its delivery. As shown below most of these efficiencies are delivered from 2020, as we prefer to consider our bottom up efficiency challenge from our current transformation plans rather than relying on a future “frontier shift”, acknowledging that this is more challenging to deliver.

Wholesale Network Plus Expenditure Area	Initial efficiency from 2020	Efficiency p.a. after 2020	Overall per annum 2020-25 “efficiency shift”	£m efficiencies	Annual real price effects above CPIH (except retail)
Wholesale Water Network Plus opex	-3.2%	-0.7%	-1.2%	17.2	1.8%
Wholesale Water Network Plus capex	-8.8%	-0.9%	-2.5%	23.2	0.9%

Table 24 Efficiency summary

We have submitted three Wholesale Water Network Plus cost adjustment claims as part of business plan, this is one less than at early submission and reflects our omission of the congestion cost adjustment claim on the grounds of materiality. These are summarised below. We have not submitted any capital enhancement schemes as cost adjustment claims.

The details of these claims are set out in Section C5 - Cost & Efficiency, but in summary are:

Water Treatment Complexity

We incur additional costs associated with water treatment compared to other companies and this is especially the case with regard to the Purton and Littleton water treatment works. Whilst it is likely that Ofwat's PR19 cost assessment models will take some account of the level of treatment complexity, Ofwat's models may not capture the full costs associated with operating a number of SW5 treatment works, inclusive of Purton and Littleton (e.g. reflecting the nature of the raw water quality). In the scenario that the PR19 cost models only control for a medium or 'average' level of treatment complexity such as the 'proportion of water treated at works of complexity 3-6', we have prepared an upward cost adjustment claim to capture the costs of operating a high number of WS5 works compared to the average. Water Treatment Complexity therefore represents a case for an upward adjustment to be made to Bristol Water's cost baseline in the Water Network Plus price control unit to reflect our additional water treatment costs, dependent of course on Ofwat's chosen PR19 models.

Prevailing Wages in Bristol

This claim relates to and is dependent upon Ofwat's chosen approach to capture differences in labour market conditions facing different companies in the PR19 cost assessment framework. If Ofwat seeks to account for wage variations as a driver of cost variations between companies and uses regional level data comparable to that used in the PR19 regional wage index to inform the assessment, this will under-estimate our wage bill as wages in the Bristol area are higher than those prevailing in the South West more generally. Prevailing wages in Bristol therefore represents a case for an upward adjustment to be made to our cost baseline in the Water Network Plus price control unit. The ultimate magnitude of the claim is dependent on the underlying source of wage information, its granularity and the benchmarks that may be drawn (for example regional or national wage comparisons. This claim may not be required, as based on Ofwat's March 2018 cost modelling consultation regional level data was not found to be significant within the efficiency modelling.

Network Age and Materials

The age (and material construction of mains laid in certain periods) of our network implies higher costs associated with capital maintenance due to age-related deterioration maintenance activities, which may not be fully captured by the network-age variables, if and to what extent they are included in Ofwat's PR19 cost models. Furthermore, the historic period informing the cost models 2011/12 to 2016/17 is likely to include a period when Bristol Water undertook an atypical level of renewal activities which are not planned for PR19; ensuring that the implied cost estimates do not capture this observation as inefficiency is therefore important. Network age and materials therefore represents a case for an upward adjustment to be made to our cost baseline in the Water Network Plus price control unit.

Cost Adjustment	Price control	Estimated value 2020/21 to 2024/25 (£m,17/18 CPIH prices)	
		Lower estimate	Upper estimate
Water Treatment Complexity	Water Network Plus	5.96	55.61
Prevailing Wages in the Bristol Water Supply Area	Water Network Plus	0	8.72
Network Age and Materials	Water Network Plus	12.28	
Total (Range)		**18.24**	**76.61**

Table 25 Summary of PR19 Water Network Plus cost adjustment claims

7.2 Delivering efficiently

We need to continue to transform our business in order to deliver the step change in efficiency that we have set ourselves as a challenge for PR19 and beyond.

To enable us to meet the challenging targets we have set ourselves, we have made the decision to build a Transformation Function. We have a history of delivering successful transformation programmes, however now we see the value in establishing a 'Function' that will be an enduring entity and key pillar in the organisational structure. The function will be a centre of excellence for transformation and programme/project management capability that will support and drive all transformation activity across the business.

We define Transformation as:

- Any major change, spanning one or more of people / process / policy / technology;
- Requiring significant effort to deliver, and therefore a dedicated team, above and beyond the capacity of the BAU team / directorate;
- Spanning multiple teams or having major impact for one large team; and
- Driving significant savings / requiring significant investment

At any one time, transformation resources will be focused on a small number of major programmes that give the business the best chance of driving the required step-change in performance.

The Transformation Function will:

- Shape, co-ordinate and drive an integrated transformation portfolio for the company;
- Establish strong governance and change control processes allowing new priorities to be integrated and delivered;
- Act as the business conscience, joining up the different pillars of activity and managing interdependencies, risks and scope overlap between the various projects;
- Have an overarching view of progress against plan at a portfolio level;
- Provide central tracking for a consolidated view of benefits and deliverables across the portfolio;
- Drive consistency in delivery through the issue of standard templates for PIDs, project plans, status reporting, RAIDO etc.;

- Operate with an Executive Steering Group for steer, decision making and escalation; and
- Provide varied levels of programme support dependent on need.

The process moves through four phases of solution identification, high level design, detailed design and implementation. At each stage an appropriate steering group reviews the output and provides the approval to continue. Our Business Improvement and Innovation team undertake a phase of solution identification in order to identify where the business can make improvements. Projects that require a major change for implementation are undertaken by our permanent Transformation Function (outlined in section A1 of our business plan) which operates under the steer of an executive steering group. Smaller items continue through to implementation with the Business Improvement & innovation team. Both teams work collaboratively to ensure effective delivery. This model allows us to constantly challenge and improve our operation.

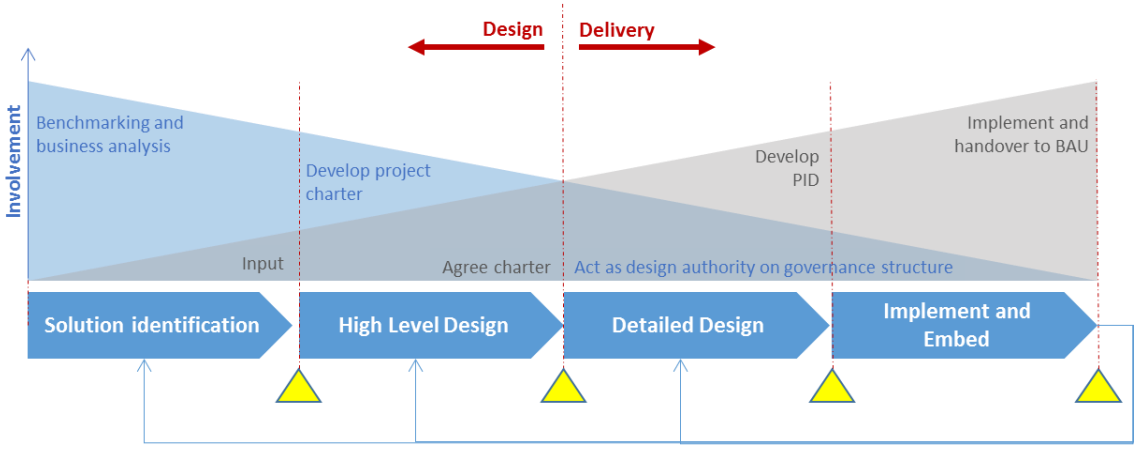


Figure 22 Transformation process

There are five distinct stages that have led us to our efficiency position:

1. **Benchmarking Activity:** We employed third parties (Enzen and Hackett) to review our business and benchmark our position. This gives us some high-level areas of focus and challenge as we moved into our efficiency review.
2. **Efficiency Assessment:** We conducted subject matter expert (SME) interviews across all areas of our business and this gave us an initial view of where we could seek efficiency. 65 initiatives were initially identified, and these were grouped into high-level themes/benefit drivers.
3. **External review and prioritisation:** To ensure sufficient ambition, we brought in an external consultancy, Baringa, to review these initiatives, and prioritise them based on value and maturity. This work was split into two review phases (forming our external assurance). The first phase identified a large number of initiatives to remove, due to low value and scope. The second phase identified additional opportunities, and grouped the remaining initiatives based on key themes, such as energy management, and continuous improvement.
4. **Internal review:** Following the external review, the remaining initiatives were reviewed internally by business SMEs, to highlight any limitations (operational or other), and to verify the underlying assumptions and calculations. SMEs provided consensus on the remaining initiatives, and give us confidence that we have sought out appropriate efficiency areas.

5. **Innovation challenge:** For the specific investment cases within our business plan we engaged a third party, Isle Utilities, to undertake a market scanning exercise and identify where we can pursue likely future benefits. These activities ensure we continue to push the industry frontier forward. Isle Utilities undertook a review of our investment cases, prioritising focus areas according to the impact on outcomes, expenditure and the long term ambition of the company. Within these focus areas Isle undertook a market scanning exercise of technologies that we should aim to exploit in the next AMP, in order to deliver the investments cases as effectively and efficiently as possible.

This process begins to mobilise an ambitious programme of change, building on the success of our previous transformation programme: Project Channel. The breadth and transformational nature of this programme firmly indicate that the efficiency targets put forward in our plan are ambitious. These plans are summarised below:

Efficiency Initiatives

Area	Description
Energy Management	A suite of low-carbon initiatives and innovations to reduce the volume and cost of energy used such as: • Solar generation • Gas generation • Pump schedule optimisation
Commercial and Operations	A root and branch review of how deliver our key operations including transformation of: • Our sourcing strategy for maintenance activities • Productivity improvements of operational activities • Targeted focus on contractual efficiencies • Upgrade of our core IT operational platforms
Continuous improvement	A series of process improvements to drive higher output at reduced cost such as: • Improved reporting, control and systems for project delivery • Automation of high-effort manual processes
Production optimisation	A range of initiatives focussing at driving cost improvements across system, site and process levels, for example: • Whole-system optimisation to ensure least cost works are used at maximum output • Optimised maintenance plans for least whole life cost, including a shift further towards planned work. • Chemical optimisation to reduce spend

In terms of customer we have also generated a customer programme that will revolutionise our customer service proposition, optimising current customer interactions whilst simultaneously providing the customer with timely access to job status information within their channel of choice. The programme is made up of a number of constituent projects and supporting activities which include a new website, integrated single view of the customer, cross channel analytics, a portal for developers and end to end case management to name but a few.

These plans are already being taken through our change process, refined, reviewed and prepared for implementation within the business ahead of AMP7 in order to put us in a strong position for the next AMP.

These plans are highly ambitious, impacting the all areas of the company, with ambitious change and targets underpinned by continued capability growth and service improvements.

As an enduring entity in the business, the Transformation Function will work hand in hand with the Innovation team to manage a 'pipeline' of opportunity that could transform the business. The innovation team will be our 'eyes on the horizon', identifying new opportunities and ways of working. They will act an incubator, carrying out the initial testing and viability of ideas and looking at the efficiencies and capabilities they could deliver, in line with our business objectives. When these ideas reach a compelling level of maturity and opportunity they will be presented at the Transformation Executive Steering Group where they will be reviewed and if approved will then move into the Transformation Function for implementation.

7.3 Innovation

We consider innovation to simply be: doing things differently to achieve a benefit.

We use a structured approach to identify innovations to help us transform and deliver benefits. We also seek continuous improvement via a daily focus on using innovation to improve our work. In 2017 we launched our innovation framework which ensures we have the right building blocks in place to steer and monitor innovation. It also ensures that we foster corporate culture from the ground up; we see innovation as part of our everyday working.

We steer and monitor innovation by:

- Maintaining clear policies and expectations;
- Being aware of innovative ideas by, for example;
    - Regular technology needs assessments; and
    - Relationships with industry bodies such as innovation events with British Water;
- Overcoming barriers to innovation; and
- Ensuring leadership oversight of progress.

Collectively, these activities help us identify where innovative solutions are required, to invite internal and external ideas, and to pilot potential solutions.

There are various stages of managing our innovation portfolio; each stage is reported to our executive team:

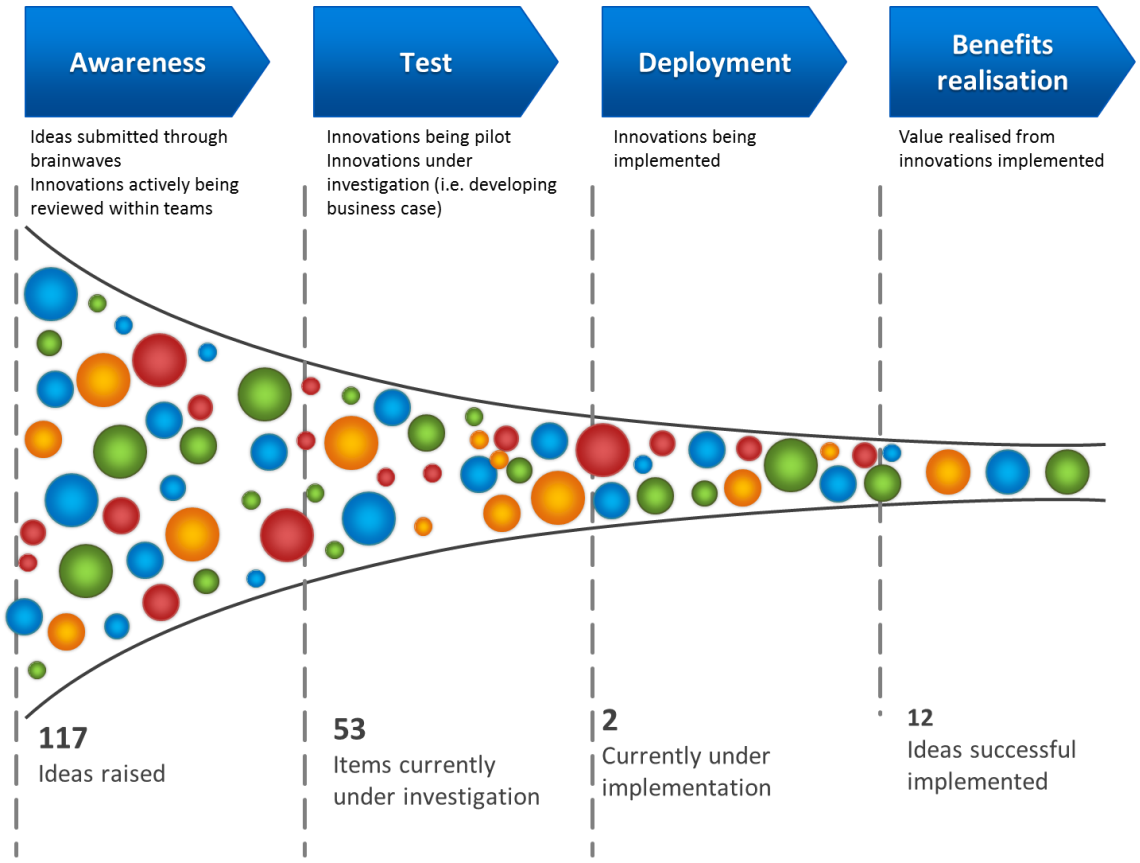


Figure 23 Innovation portfolio management stages

We foster a culture of innovation through:

- Partnerships with research organisations, supply chain partners and academia;
- Ensuring staff have the processes, resources, and support to convert innovation in to action; and
- A network of innovation champions.

We aim to be more ambitious when it comes to sharing our successes in the future, we are planning:

- Regular press releases to create a presence;
- Conference attendance on innovation;
- Planned engagement to deliver our key messages e.g. “We have the most innovative approach to customer service”; and
- Attendance at industry pier forums e.g. research and development forums.

Our Transformation Function works with our Innovation team to manage a ‘pipeline’ of opportunity that could transform the business. The Innovation team is our ‘eyes on the horizon’, carrying out the initial testing of ideas in line with our business objectives. When these ideas reach a compelling level of maturity they move into the Transformation Function for implementation.

Examples of success

Operational resilience - our partnership with Imperial College has led to Dynamic DMA technology, a project that has recently been shortlisted for the Resilience Project of the Year in 2018.

The 2017 innovation exchange led to a number of technologies being taken forward, including pontoon works to reduce the safety risks surrounding maintenance of our assets.

Operational resilience - resilient and dynamically adaptive water distribution networks

Our long-term collaboration between Bristol Water, a technology company with extensive experience in pressure control (Cla-Val) and a world leading research-led university (Imperial College London), has led to us implementing analytical methods and control technologies to enable the concurrent design, operation and control of dynamically adaptive water distribution networks that automatically configure their connectivity and hydraulic conditions.

This minimises leakage and supply interruptions. By keeping a network calm; it also helps to minimise water treatment costs and improves water quality.

Service resilience, financial resilience - we have introduced robotic process automation to allow us to automate repetitive and manual tasks, saving hours of manual effort.

Service resilience - we are starting trials later this year using BioBullets to control Zebra Mussels at our treatment works. This idea originated from our staff suggestion scheme and is an innovative way of controlling an invasive species.

Service resilience - Bristol Water's pop-up Water Bar won two awards at the Water Industry Achievement Awards, including "Outstanding Innovation".

Emerging Markets - Though the market codes dictate the level and quality of service expected from a wholesaler, our wholesale team continue to invest in our services and give a tailored and excellent service that goes beyond what the market has officially dictated. (see more below)

7.4 Targeted controls, markets and innovations

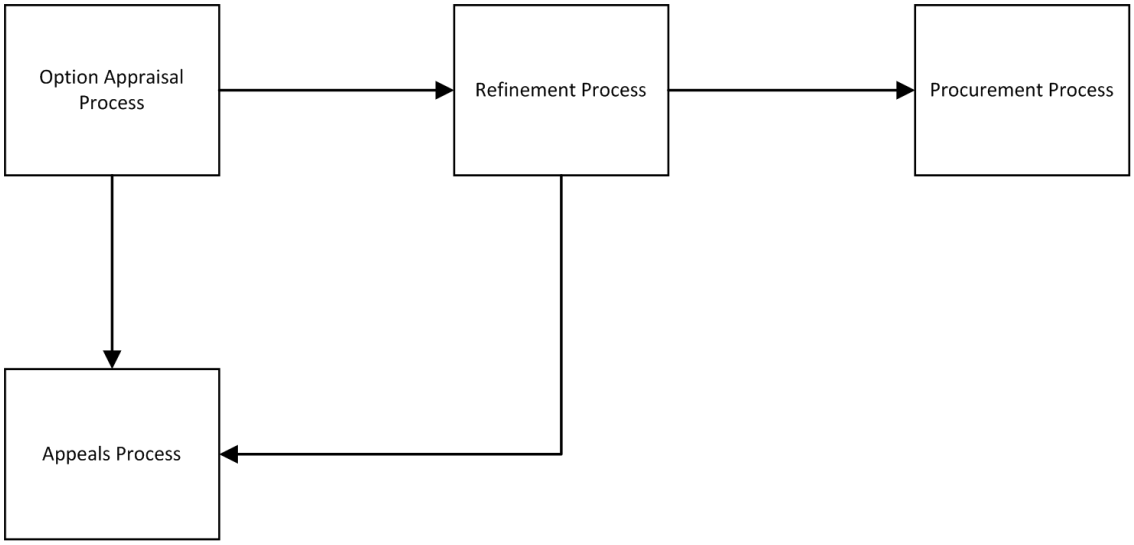
The market principle brings significant value to Water Network Plus in several ways. Firstly, it will help us with rapid identification and implementation of innovative techniques in areas such as leakage reduction and water efficiency to help us meet the challenging targets we have set ourselves in AMP7. We know that innovation normally involves a range of stakeholders and we cannot innovate alone, so our bid assessment framework provides a structured way to assess the innovation stage of a proposal and identify new ideas and technologies that can help us to meet the challenges we face at best possible value to our customers.

7.4.1 Bid assessment framework

Our bid assessment framework sets out the processes for both assessing and encouraging bids from third party providers of water resources, leakage and demand management services.

It is underpinned by three key principles:

- Transparency; of process, selection and award criteria to all bidders, ensuring that we do not create unfair advantages towards either our in-house solutions or third party bidders;
- Equal treatment and non-discrimination; in each step of the process, so all potential suppliers have an equal opportunity to compete for a contract;
- Proportionality; By keeping the process simple, without creating over specification of requirements, therefore, keeping bidding costs low for interested third parties;



- **Options Appraisal Process** – This is the pre-qualification and need specification process in order to identify and assess all options for suitability of use at Bristol Water;
- **Refinement Process** – The confirmation process to ensure that selected potential options still provide the required outcomes, once they have been consolidated with the established programme. Additionally, the refinement process will assess new innovation and/or technology;
- **Procurement Process** – This is an established process of procurement and contract issue outside of the BAF option identification process (shown in this document for clarity); and
- **Appeals Process** – This process provides the opportunity for third parties to appeal to an independent appeals team and challenge a rejection decision. If the appeal is successful, the option can be reconsidered, but if the appeal is not successful, the third party will receive feedback confirming why the option rejection is valid.

8 Financeability, risk and reward and affordability

Wholesale Water Network Plus revenues are broadly stable in CPIH terms after the initial reduction. The impact of the PR14 reconciliation revenue adjustments ("Post financeability adjustments") amounts to circa 2% lower revenues p.a., which will reverse in 2026. Given the revenue/bill profiles, the reconciliation adjustments have been profiled evenly across 2020-25.

The £9.3m of non-price control income is made up of £4.2m bulk supplies, £4.2m rechargeable works and £1.5m other (predominantly standpipe hire income) – all at 2017/18 CPIH prices. The £1m projected income from principal services relates to rental income from investment properties, net of expenditure.

Grants and contributions reduce in 2020-21, reflecting lower network reinforcement expenditure requirements, and the Ofwat policy decision to reflect income offset netting off infrastructure charges, which has a particular impact for Bristol Water due to the large market share of Self Lay Participants in the developer services market.

	Unit	Annual Water Network						
		2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2020-25
		Notional Structure @ 2017-18 FYA (CPIH deflated)						
Totex	£m		75.3	75.1	72.5	76.0	77.0	375.9
PAYG rate	%		72.2%	72.5%	75.1%	71.9%	71.0%	72.5%
Closing RCV	£m	410.9	409.2	407.2	402.7	401.6	401.4	404.4
RCV run off rate	%		5.36%	5.36%	5.36%	5.36%	5.36%	5.36%
RVC additions rate	%		5.32%	5.32%	5.32%	5.32%	5.32%	5.32%
Wholesale WACC Nominal / Margin	%		5.61%	5.61%	5.61%	5.61%	5.61%	5.61%
PAYG	£m		54.4	54.4	54.4	54.6	54.6	272.5
Return on capital	£m		12.5	12.6	12.7	12.7	12.8	63.3
RCV Run Off	£m		22.7	22.6	22.6	22.5	22.5	112.9
Tax	£m		1.7	1.8	2.0	2.1	2.1	9.6
Post financeability adjustments	£m		(1.9)	(1.9)	(1.9)	(1.9)	(1.9)	(9.3)
Operating income price control	£m		(1.7)	(1.7)	(1.7)	(1.7)	(1.7)	(8.3)
Third party revenue	£m		-	-	-	-	-	-
Third party / principal services	£m		-	-	-	-	-	-
Income non-price control (principal services)	£m		(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(1.0)
Capital contributions from developers	£m		2.8	2.7	2.8	2.8	2.9	13.9
Revenue	**£m**		**90.3**	**90.5**	**90.7**	**91.0**	**91.2**	**453.8**

Table 26 Water Network revenues during AMP7

	Unit	Annual Water Network					
		2020-21	2021-22	2022-23	2023-24	2024-25	2020-25
Total operating expenditure	**£m**	**42.7**	**42.7**	**43.0**	**43.3**	**43.8**	**215.4**
Infrastructure maintenance expenditure	£m	12.0	12.2	12.2	12.1	11.7	60.2
Non-infrastructure maintenance	£m	12.5	12.9	9.5	13.5	14.4	62.8
Enhancement investment	£m	10.9	22.3	22.7	22.1	21.6	111.6
Total gross capital expenditure	**£m**	**35.4**	**35.1**	**32.3**	**35.5**	**36.0**	**174.4**
Grants and contributions	£m	2.8	2.7	2.8	2.8	2.9	13.9
Total net capital expenditure	**£m**	**32.6**	**32.4**	**29.5**	**32.7**	**33.2**	**160.5**
Totex	**£m**	**75.3**	**75.1**	**72.5**	**76.0**	**77.0**	**375.9**
Natural PAYG Rate	%	72.6%	73.0%	76.2%	72.9%	72.1%	73.3%
Adjustment to PAYG Rate	%	-0.5%	-0.5%	-1.0%	-1.0%	-1.1%	-0.8%
Total PAYG rate	%	72.2%	72.5%	75.1%	71.9%	71.0%	72.5%
TOTAL PAYG	**£m**	**54.36**	**54.45**	**54.43**	**54.64**	**54.63**	**272.51**

Table 27 Annual PAYG rate

The key challenge in a low enhancement capex programme is that this to an extent lowers the opportunities for frontier-shift of operating costs. Whole life cost delivery of supply interruptions, metering and leakage sees a shift in expenditure from infrastructure capital enhancement into operating costs over time. This includes more direct employment, rather than contractor overheads recovered through large mains replacement and enhancement programmes (such as the Southern Resilience Scheme completed in 2018, which was the last part of a 15 year programme of major infrastructure investments to allow supplies from more than one source to all population centres above 25,000). More direct employment, rather than indirectly through capital schemes, also reflects insight from our customer research and engagement as customers notice a far better service and experience when they feel that they are served directly by Bristol Water staff. Targeting 10,000 population centres from long interruptions to supply takes a different approach, with targeted maintenance that also benefits leakage.

As described earlier our plan is focussed on operating cost and maintenance expenditure. The expenditure is a smooth level of investment each year, which is an efficient way of delivering our investments and emphasises that even the enhancement expenditure is mostly “maintenance-like” in our delivery approach. We describe key areas of expenditure in this section, however these do not deliver our performance commitments in isolation as operational and service changes are just as important.

Water Network Plus IRE expenditure

Infrastructure renewals capital expenditure falls from £68m in AMP6 to £64m in AMP7, of which £60m is within Wholesale Water Network Plus. This is in part due to additional one off expenditure due to the exceptional weather in 2017 and 2018, but also reflects our efficiency target, reallocation of leakage expenditure to operating cost as a new target is met (this is the regulatory presentation as the IAS accounting treatment is the same).

Other than trunk and distribution mains planned refurbishment and replacement, key areas are:

- Customer stop tap and pipes - £10m
- Changes to hydrants to reduce supply interruptions- £3m
- Leakage control and pressure management - £4m

Non-infrastructure maintenance costs (MNI)

These costs increase to reflect the timing of expenditure at our pumping stations and treatment works. MNI also delivers more network monitoring technology and IT integration to deliver field force and supply chain information – essential for new services, vulnerable customer support ambitions and a single view of customer rather than just asset impacts. Expenditure for high level pumps at Purton and water quality maintenance at Banwell contribute to this increase.

Water Network Plus maintenance costs

Other than day to day works and equipment maintenance, the key areas of expenditure are:

- Replacing customer meters: £4m
- Stowey ozone plant replacement: £3m
- Banwell membrane and UV plant: £4m
- Network monitors and pressure logger: £4m
- Purton High Lift Pumps: £4m
- Crypto membrane plant refurbishments: £2m
- Integrated applications – API enables us to connect data across systems to delivery partners (e.g. water efficiency platform): £4m

Enhancement capital expenditure

The amount of enhancement capital expenditure across Water Resources and Water Network Plus falls from £79m in 2015-20 to £45m in 2020-25, of which £37.5m is within network plus. Major enhancements are:

- Optional and selective metering: £9m
- SEMD (infrastructure security): £0.5m
- 10,000 population centre resilience: £12m

The enhancement programme reflects current efficient costs and has been benchmarked externally. Detail is provided for each investment case in Section C5 - Cost & Efficiency. The resilience investment is the only “optional” enhancement component that is service driven. This is reflected in a specific outcome incentive as set out in Section C3 - Delivering Outcomes for Customers. The metering programme is also cost beneficial and is reflected in its own outcome incentive. The DWI quality programme is reflected in the CRI outcome incentive. The WINEP programme is reflected in the WINEP outcome incentive, with the environmental impact on a cost beneficial basis reflecting customers support is also incentivised through the innovative raw water quality and biodiversity index ODIs.

WI quality programme:

Key components are:

- Alderley TW plumbosolvency: £0.5m
- Cheddar TW algal bloom trial extension: £0.5m
- Lead pipe – nurseries and quality: £0.5m

New developments (net of developer contributions): £14m

The individual investment areas are set out in Technical Annex CB5 to Section C5 - Cost & Efficiency.

PAYG Rate

Another reason for the increase in operating expenditure relates to leakage reduction. Achieving the 12% leakage reduction targeted in 2015-20 sees these costs (c. £0.7m p.a.) transfer to opex to keep leakage at this lower level. This whole life cost benefit, together with further leakage reduction which also forms part of "PAYG" whether opex or infrastructure maintenance, is required for the WRMP supply demand balance, but by including in the natural PAYG rate balances service improvements with customer preferences for smooth bill changes.

The PAYG rate reflects all opex and infrastructure maintenance investment in each year. Given the long term stability in our forecast maintenance expenditure, in order to support financial ratios we have set the annual PAYG rate to reflect expenditure as shown above. The PAYG rate increases significantly compared to the 55% wholesale determined at PR14, which reflects the very different nature of the investment programme. The Southern Resilience Scheme at PR14 reflected an enhancement, and the changing nature of investment towards delivering improvements as part of maintenance sees an increase to a long term PAYG rate of circa 73%.

RCV Rates

The natural RCV rates in our plan have been calculated with reference to forecast depreciation charges and therefore reflect the expected lives of the underlying assets.

RCV Run Off Rates	Unit	Water Network Plus			
		pre 2020 RPI	pre 2020 CPIH	post 2020 CPIH	Blended CPIH
Natural RCV rate	%	5.91%	5.91%	5.45%	5.82%
RPI CPIH transition adjustment	%	-0.50%			-0.49%
Reducing balance RCV run off rate	%	**5.40%**			**5.32%**

Table 28 Water Network Plus RCV run off rate

The natural RCV run off rate is adjusted so that the return on RCV reflects that amount of revenue that would have been received before the switch to 50% opening balance CPIH indexation.

8.1.1 Water Network Plus in average bills

The Water Network Plus element of the total average bill for AMP7 shows a decrease over the period of -2.0% whilst the Water Resources has a small increase of 0.4% and Retail element decreases by 0.2%. This bill presented does not reflect the likely wholesale charges approach, where Water Network Plus charges include the cost of water resources leakage. This reflects the significant efficiencies in Water Network Plus that are built into our plan, despite the higher PAYG rate. This expenditure delivers significant service improvements, at a lower bill, in line with the customer research presented in Section C1 - Engagement, Communication and Research.

Notional Structure - 2017-18 FYA (CPIH deflated)				
Average Bill £s	2020-21	2024-25	Average	% Increase
Water resources	26.9	27.6	27.2	0.4%
Water network plus	128.2	124.8	126.5	-2.0%
Water wholesale	155.1	152.4	153.7	-1.6%
Retail	19.6	19.2	19.5	-0.2%
Total Bill	174.7	171.6	173.3	-1.8%

Table 29 Notional structure

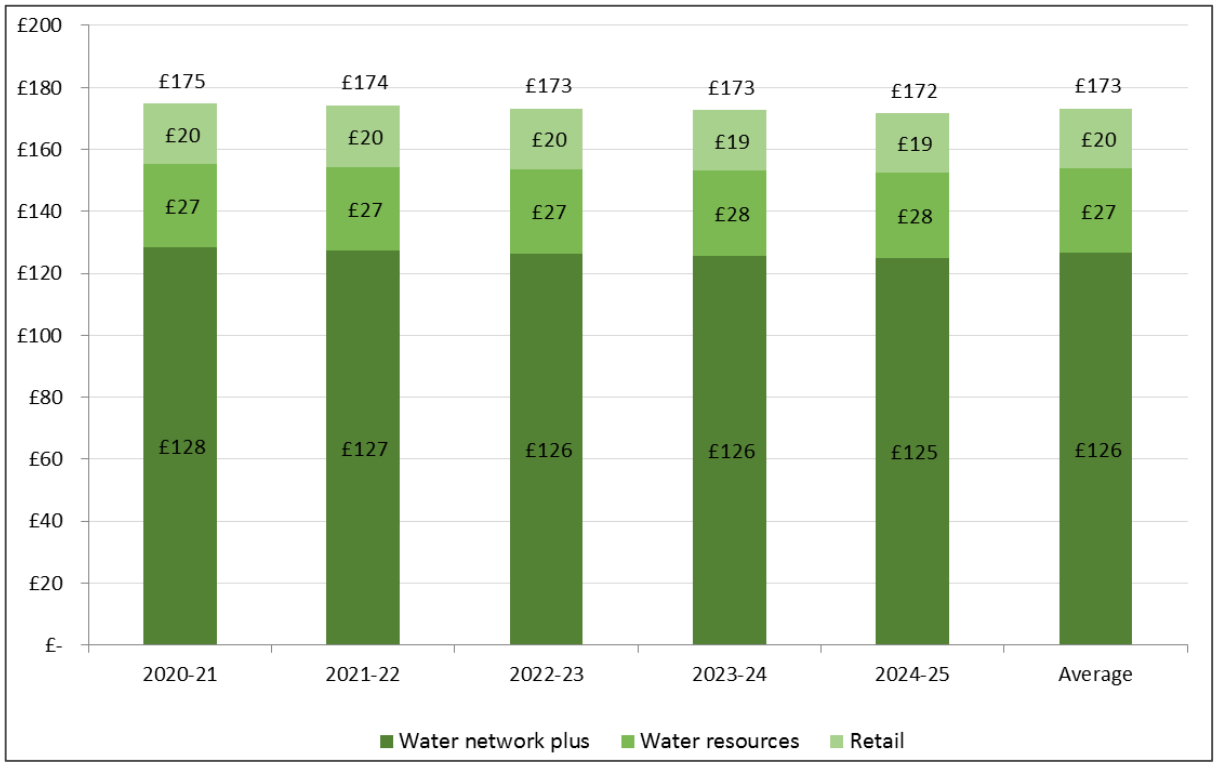


Figure 24 Average bill (CPIH deflated) split by Business Sector

		Annual Water Network						
	Unit	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2020-25
		Notional Structure @ 2017-18 FYA (CPIH deflated)						
Totex	£m		75.3	75.1	72.5	76.0	77.0	375.9
PAYG rate	%		72.2%	72.5%	75.1%	71.9%	71.0%	72.5%
Closing RCV	£m	410.9	409.2	407.2	402.7	401.6	401.4	404.4
RCV run off rate	%		5.36%	5.36%	5.36%	5.36%	5.36%	5.36%
RVC additions rate	%		5.32%	5.32%	5.32%	5.32%	5.32%	5.32%
Wholesale WACC Nominal / Margin	%		5.61%	5.61%	5.61%	5.61%	5.61%	5.61%
PAYG	£m		54.4	54.4	54.4	54.6	54.6	272.5
Return on capital	£m		12.5	12.6	12.7	12.7	12.8	63.3
RCV Run Off	£m		22.7	22.6	22.6	22.5	22.5	112.9
Tax	£m		1.7	1.8	2.0	2.1	2.1	9.6
Post financeability adjustments	£m		(1.9)	(1.9)	(1.9)	(1.9)	(1.9)	(9.3)
Operating income price control	£m		(1.7)	(1.7)	(1.7)	(1.7)	(1.7)	(8.3)
Third party revenue	£m		-	-	-	-	-	-
Third party / principal services	£m		-	-	-	-	-	-
Income non-price control (principal services)	£m		(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(1.0)
Capital contributions from developers	£m		2.8	2.7	2.8	2.8	2.9	13.9
Revenue	**£m**		**90.3**	**90.5**	**90.7**	**91.0**	**91.2**	**453.8**

Table 30 Water Network Plus revenue

Revenues increase marginally over AMP7, which reflects an increase in totex above CPIH inflation; although most of this impact reflects service improvements as broadly on going efficiencies offset input price effects, after the initial efficiency assumptions built into the plan.

8.1.2 Regulatory Capital Value

Approach	Water Resources	Network+
1. Net MEAV as at 31.3.17	26.4%	73.6%
2. Net MEAV projected to 31.3.20	25.9%	74.1%
3. Opex & Capital Maintenance 2011/12 to 2017/18	18.3%	81.7%
Average of approaches 2. & 3.	22.1%	77.9%

Table 31 Calculation of proposed regulatory capital value allocation

We set out in our January submission the circumstances where we believe it would be appropriate for us to revisit our approach to this allocation for the final submission of our business plan:

- That our expenditure plans in the remainder of 2015-20 change significantly from those set out in the January submission; or
- Financeability testing for the Water Resources and Water Network Plus price controls at PR19 provides an objective reason for reconsidering the allocation.

We have not identified any specific issues which indicate that we need to revisit our approach to the allocation, and as such our proposal is on the basis set out in January, with the calculated updated for minor changes that reflect updated expenditure information for 2017/18 and forecasts out to 2020 consistent with our PR14 reconciliation submission (which included the revised RCV allocation to water resources of 22.07%, compared to the 22.2% original submission).

Therefore, our final proposed opening RCV allocation to Water Network Plus is 77.93%.

8.1.3 Water Network Plus Risk & Return

A full analysis of the Water Network Plus risk and return is set out in Section C6 - Financing, Affordability and Risk and Return. We set out in Section 5.1 the outcome incentives that apply to the Water Network Plus control, which amount to a 90% confidence interval between an underperformance penalty of -£22.127m and an outperformance reward of £10.777m. In addition D-Mex accounts for an underperformance penalty of £0.695m and an outperformance reward of £0.348m based on 5% and 2.5% of expected developer services revenues.

Water Network Plus shows a RORE range of -1.1% to +8.1%, which is broadly in line with appointee RORE of -0.8% to +8.7% after taking into account the residential retail returns element. This reflects that the most significant outcome incentives, other than C-MEX, are within the Wholesale Water Network Plus Control.

The main cost risks and efficiency challenges and opportunities are also within the Water Network Plus control. These are largely general ranges of efficiency from the transformation programme, except for the specific Cheddar Treatment Works and highways permitting scheme risks mentioned in the overall summary. We do not assess any specific developer services revenue risk as been within the 10% to 90% central RORE range in practice.

We adopt a cost of capital of 5.61% nominal, in line with our appointee cost of capital less a 0.1% margin reduction. We do not consider there to be an objective reason to vary the cost of capital between water resource and Water Network Plus, and consider financial viability at appointee level because of the integrated nature of risks.

Water Network Plus RORE	Bristol Water PR19 Water Network Plus
ODI outperformance	1.3%
SIM / C-MeX / D-MeX outperformance	0.0%
Totex outperformance	2.4%
Financing outperformance	0.1%
ODI underperformance	2.7%
SIM / C-MeX / D-MeX underperformance	0.1%
Totex underperformance	2.4%
Financing underperformance	0.2%
10%	-1.1%
Central	4.3%
90%	8.1%
Downside (P10%)	-5.4%
Upside (P90%)	3.9%

Table 32 Regulated equity

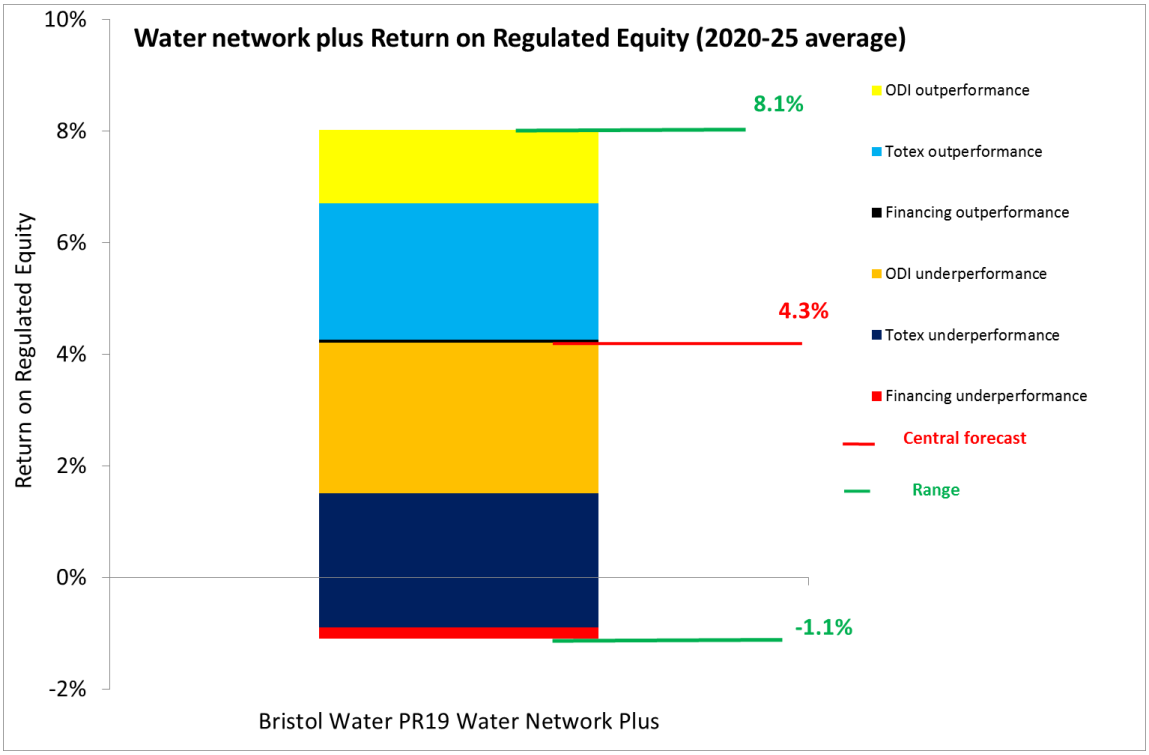


Table 33 Water Network Plus return on regulated equity – 2020-2025 average

9 Water Network Plus past performance

We recognise that customers have to trust the way regulated companies report on their performance. We want to be a positive example at a time when the sector is under scrutiny. Therefore, given that leakage is one of our customers' top priorities and of increasing focus for the industry, in February 2018 we committed that our outcome incentives for 2015-20 are calculated without taking into account technical adjustments that could benefit the incentive calculation. We separately report our actual level of leakage based on up-to-date assumptions.

We increased leakage resources over 2017/18, but despite this did not meet our target, with the severe weather in March 2018 playing an important role. By increasing resources now, we are confident that we will meet our actual level of leakage target for 2018-2020 and reduce leakage further by 15% by 2025.

We have not met all of our performance commitments during 2015-20, and this results in a total of £10.3m (2017/18 prices) reducing customer bills. We will return £1.1m of this early as part of our leakage commitment, reflecting performance up to 2017/18. As well as returning money to customers, we demonstrate in our plan that we are taking action now so that customers are not paying for recovery of any current performance shortfalls after 2020. We apply this to Water Network Plus revenues.

The key reasons for why some of our performance commitments have not been met are set out in full, in our 2017/18 annual report. In summary they are:

- Supply interruptions (unplanned customer minutes lost) – we have had exceptional one-off incidents in 2015/16 and 2017/18, but we would have met our target without these events. There was no underlying asset health cause of these incidents, as we show in our Willsbridge case study. Our resilience investment will reduce risk to customers further over 2015-20;
- The freeze-thaw in March 2018 meant we missed our asset health infrastructure target because of mains bursts. This then also fails 2018/19 performance automatically;
- Mean Zonal Compliance is a water quality metric and we failed this target due to nickel in customer tap fittings, which is largely out of our control. The new Compliance Risk Index target for 2017/18 was at the industry frontier at 0.032. Our underlying performance on water quality is strong;
- With meter penetration we have seen slower take up from customers. We are increasing promotion of meters and resources to meet our 65.9% target in 2020; and
- Customer service targets have also sometimes not been met due to the operational incidents, particularly as complaints increase.

We have also outperformed on wholesale totex and sold surplus land, which both reduce bills through a 50% sharing rate.

10 Beyond AMP7 – Our long term corporate ambitions

Over our long history, we have gained the trust of our customers as we have remained true to our original roots; to break new ground, and to be ambitious, in finding better ways to plan for the future and to respond to our customers' expectations, changing societal and environmental needs, and the needs of future generation.

We will continue to work closely in collaboration with local communities, local businesses and stakeholders to meet the future needs of our customers, stakeholders and the environment, fulfilling a role well beyond the basic provision of water.

As outlined in Section 3, when we consulted on our long term strategy, stakeholders' input shaped not just AMP7 but our long term plans out to 2050.

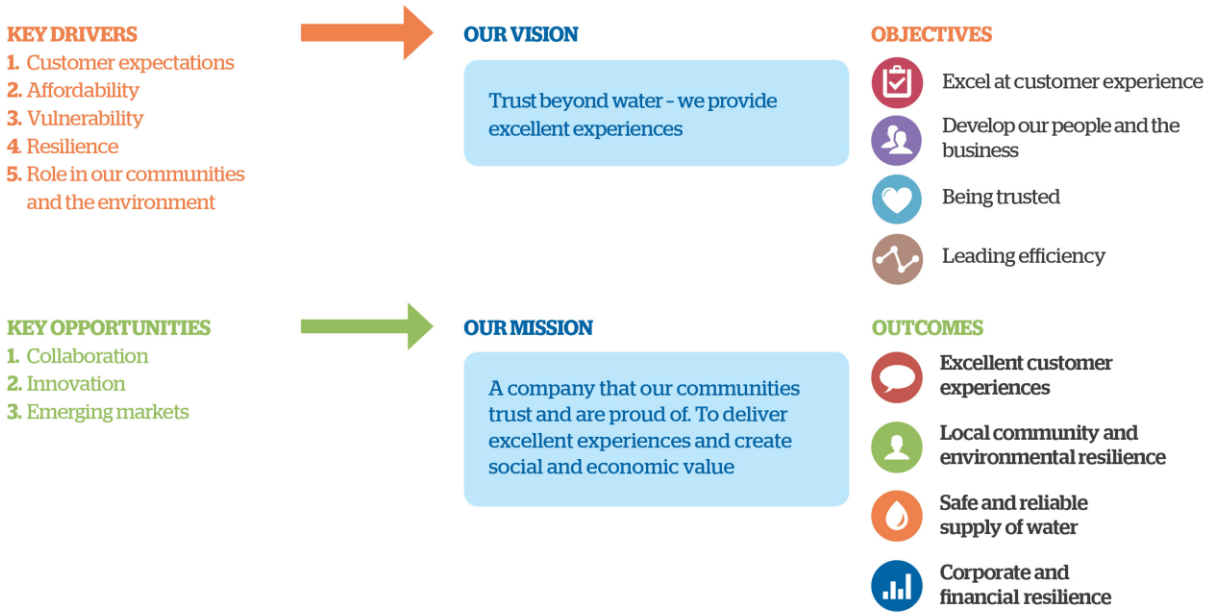


Figure 25 Long term ambition

Society is changing and the needs and expectations for our services do not stay the same over time. Changes in the income levels of individual groups of customers can, over the long term, affect the wellbeing of everyone.

We will continue to want our bills to be affordable for all of our customers. We will need to provide new and better services, in new ways, and plan to do this at a lower long-term cost.

When shaping our services, we will consider the differing needs of customers, to ensure that our services are inclusive for all.

In recent years we have strengthened our resilience in a number of areas, including customer service, operations, environment and corporate resilience.

We take a long-term view on this resilience, building on the benefits we provide as an innovative, local water company and we have long-term investors who help us to be efficient in how services are financed.

To offset demand growth by 2050 we intend to improve:

- Leakage improvement levels to 35Ml/d;
- Increase in meter penetration to 90%; and
- 110 litres/head/day Per Capita Consumption by 2050 demand growth.

We will improve resilience to population centres greater than 10,000 over a two AMP period. Following delivery of our AMP7 resilience programme it is planned that resilience for the remaining population will be provided in AMP8.

In terms of our environmental footprint, we also aim to reduce carbon emissions with initiatives such as reducing energy use and producing more of our own renewable energy at our sites.

The close relationships we have built with our communities give us unique opportunities, with the potential to link into smart city partnerships and innovations. Bristol and its surrounding areas is becoming a hub for testing new ideas and for collaboration with research institutions and businesses at the forefront of new technology.

We recognise that there is a rapid pace of change in technology, and it's important that we respond to this and be prepared for the future changes that affect the services that customers want and our role in providing them.

Innovation in both the technology we use and the way in which we work, provide a key opportunity to meet changing customer wants and needs.

We expect to see changes in the way water services are provided and want to play a leading role to ensure that they happen. Providing customer excellence will need to transform over time into customer choice around the services they receive. In the long term, we are ambitious to lead the sector in customer excellence and grow our business, particularly as we expect that market developments will help to deliver the best value for customers. Choice may be over retailer (a choice business customers already have), but most important is choice over how services are received and how customers engage with them. Bristol Water may be enduring, but that doesn't mean we don't welcome and shape change.

We expect social factors will be the key external factors which affect our business in the future. This isn't unique to Bristol Water, but is particularly important to utilities where customers don't have as wide a choice about the services they receive as they experience from other sectors. Our long-term ambition anticipates massive change in what customers expect for the water industry and other utilities.

11 Securing trust, confidence and assurance

We have taken a new approach to assuring that we provide a high-quality plan. Section C8 - Securing Trust, Confidence and Assurance of our business plan gives full information on the detailed approach, methodology, findings and evidence for each of the key tests we have applied to our business plan, showing how we will meet the expectations of our customers, regulators and other key stakeholders. Strategic direction of our assurance process has been delegated to a PR19 Board Sub-Committee with PwC appointed as strategic advisor.

This culminated in our Board making the following statements regarding our business planning process in their Assurance Statement.

Area 1: Customer Engagement	
1	We are satisfied that our customer engagement is of high quality, it is reflected in our business plan and it is an embedded on-going business practice that will secure the trust of our current and future customers
Area 2: Affordability	
2	We are confident that our plan will improve affordability for our customers now and in the longer term and our proposals for assistance should ensure affordability for those who might otherwise struggle with their water bills
Area 3: Outcomes	
3	We are satisfied that the outcomes set out in our plan over the next price control period are stretching, they are also the outcomes our customers want to pay for and we consider that management is putting in place adequate plans to position the Company to deliver those outcomes with an appropriate level of risk (given the nature, breadth and ambition of the targets)
Area 4: Resilience	
4	We are satisfied that we have met Ofwat's requirement to plan for delivering resilience in the round in our customer's long term interest
Area 5: Cost Assessment	
5	We are satisfied options have been assessed for large investments and that the forecast total expenditure is suitably robust and reflects an efficient level of cost for Bristol Water to deliver the service levels contained in the plan with an acceptable level of risk
Area 6: Risk and Return	
6	We have identified the key risks associated with the plan and have plans to seek to manage these risks
Area 7: Financeability	
7	We consider that our plan is financeable on both the notional and actual basis and that the plan protects customers interests in both the short and the long term
Area 8: Business Planning	
8	We have collectively owned the overall strategy and direction of the plan, we are satisfied it is of high quality, that it is ambitious yet deliverable with an acceptable degree of risk and we have provided our customers with transparency and engagement throughout
Area 9: Our Additional Requirements	
9	We have reviewed how we have addressed our past performance, we are confident that we have the capability to deliver the plan and that our customers can trust us to do so

12 Summary

The approach to the development of the PR19 business plan has been designed to ensure that it has customers at its heart and that customers can have confidence in its integrity and deliverability, both for 2020-25 and beyond.

In summary, the drivers of this confidence are:

- An experienced shareholder that has demonstrated commitment to a customer-led strategy and who wants to build the company's performance and reputation;
- The use of independent reviews to challenge and validate the company's strategy and business plan on several fronts, learning lessons from the past and embedding best practice into the plans for the future;
- A Board, focused on risk management, which is being further strengthened to oversee the challenges of continued business transformation and delivery of the PR19 business plan;
- An experienced CEO and executive team combining knowledge of Bristol Water with perspective and experience from other organisations including infrastructure providers; and
- A strong Bristol Water Challenge Panel, assuring the company's approach to customer research and engagement and its use in the development. Experienced assurance partners working with the Board and Executive team to complement internal challenge and review, to ensure that the plan is consistent with the company's strategy, well-evidenced and deliverable.

This plan makes firm commitments to our customers and stakeholders, but we also provide Ofwat and our other stakeholders with confidence that part of our resilience is the adaptability that small local companies can deliver. This adaptability will allow us, in meeting these commitments, to continue to change our approach as new information about our sector, customer and societal needs emerges.

This plan has been approved by the full Board of Bristol Water, and we provide an extensive Board Assurance Statement as an Appendix to this document which sets out the full details of the process and the specific assurance components that have allowed us to make this statement.