8. Delivering at efficient cost

8.1 Key messages

- **Value for money:** Our £13.7 billion proposed total expenditure (totex) will deliver more than £35 billion of estimated value for the North West, with substantially all the increase in cost being an environmental improvement programme, which at £5.7 billion is around seven times larger than the AMP7 FD. Recognising the impact on bills, we propose industry-leading levels of affordability support and propose to nearly double the level of financial support available in AMP8 and more than double the number of customers supported.
- **Efficient modelled costs and improved base totex efficiency:** We are targeting stretching performance improvements through base expenditure that is within our assessment of efficient modelled costs for wholesale and retail. We are stretching ourselves to deliver £1.1 billion of efficiencies in base totex across AMP7 and AMP8 through innovation and optimisation of solutions, robust cost challenge and effective use of markets.
- **Well-evidenced cost adjustments in pursuit of best value-long term solutions:** We have proposed £444 million of cost adjustment claims that reflect scope increases since PR19 and are, therefore, not reflected in cost models. Our plan is aligned to our long-term delivery strategy with adaptive planning pathways to focus our investment in the areas that matter the most. We have identified the best value solutions, considering whole life costs and wider environmental and social value.
- **Iterative refinement driving efficient enhancement totex:** We have reduced our initial cost estimate by £1.6 billion through challenge of the need, scale and timing of investment, and are targeting a further £1.2 billion of efficiency through innovation and optimisation of solutions, robust cost challenge and effective use of markets, and £95 million of partnership funding opportunities.
- **Robust internal and external challenge on costs, scope and deliverability:** We have engaged independent experts to help us robustly challenge the scope and costs within our plan, and the efficiency of our plan is supported by benchmarking analysis and third party assurance. AMP8 represents our largest ever capital delivery programme, and the most complex with greater use of blue/green solutions and partnership working. We have undertaken extensive supplier engagement and steps to adapt our ways of working to mobilise ourselves and our supply chain to be ready to successfully deliver our plan.

8.2 Structure

This chapter sets out the totex requirements of our AMP8 business plan, how it delivers the best value for money with improved efficiency, and the steps we have taken to mobilise ourselves and our supply chain to deliver it.

- **Section 8.3** provides an overview of the total expenditure (totex) in our plan.
- **Section 8.4** describes our approach to creating the best value plan and the cost reductions we have driven.
- **Section 8.5** sets out how we are improving efficiency in our wholesale base service, while improving performance for customers and the environment, achieving greater value for money.
- **Section 8.6** provides evidence on how we are delivering an efficient household retail service.
- **Section 8.7** compares our base totex proposal with an efficient modelled benchmark, and sets out our cost adjustment claims and allowances that sit outside of the models.
- **Section 8.8** summarises the individual projects within our enhancement programme and our approach to customer protection through price control deliverables (PCDs).
- **Section 8.9** describes how we are pursuing the best value solutions across our enhancement programme at the most efficient cost, and the internal and external scrutiny and benchmarking of our scope and costs.

- **Section 8.10** details our proposed approach to assessing efficient costs in our enhancement programme.
- **Section 8.11** sets out how we are upskilling and mobilising our teams and supply chain to ensure AMP8 readiness and deliverability of the plan, and the investment we propose to accelerate into AMP7.

There are a number of supplementary documents with more detail on themes discussed within this chapter:

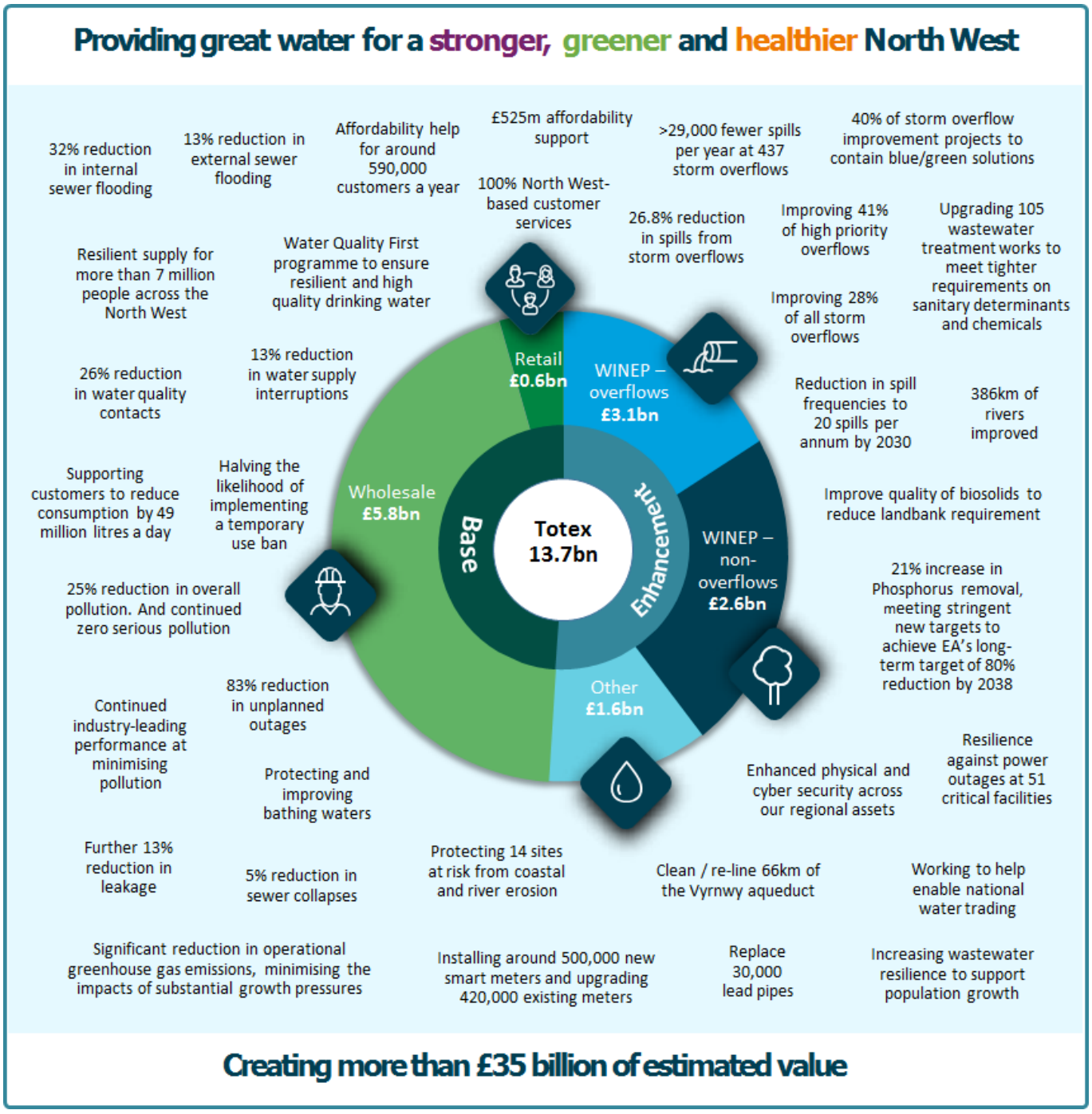
- **UUW43** provides details around our WINEP optimisation proposals.
- **UUW44** sets out our cost adjustment claims and changes made since early submission in June 2023.
- **UUW45** summarises our approach in developing our best value plan**.**
- **UUW46** sets out our approach to cost assessment at PR24.
- **UUW47** describes how we have prepared ourselves and our supply chain for the delivery of our AMP8 programme, and what we are doing to deliver our early start programmes.
- **UUW48** summarises key evidence that supports the credible delivery of the proposals in our plan.
- **UUW49** demonstrates our impressive track record of innovation.
- **UUW50** describes how we actively participate in, support and promote competitive markets to ensure best value for customers.
- **UUW51** outlines the steps taken to create a new Bioresources Bid Assessment Framework (BAF) and amend the existing water resources BAF.
- **UUW52** sets out our approach to assessing projects for potential direct procurement for customers (DPC).
- **UUW53** contains the stage 1 strategic case assessments for schemes shortlisted for DPC, assessment against Ofwat's PR24 requirements, and the schemes identified as potentially suitable for DPC.
- **UUW54** details our approach to offering developer services.
- **UUW55** sets out the key components of our plan for the Retail price control.
- **UUW56** sets out the key components of our plan for the Wastewater price control.
- **UUW57** sets out the key components of our plan for the Water price controls.
- **UUW58** sets out the key components of our plan for the Bioresources price control.
- **UUW59** demonstrates how we deliver best value for retailers in the non-household market.
- **UUW60** provides details of our water quality enhancement claims: lead; raw water quality deterioration; water WINEP; Vyrnwy; and SEMD and NIS-D.
- **UUW61** provides details of our water supply and demand enhancement claims: leakage; smart meters; and water efficiency.
- **UUW62** provides details of our water markets enhancement claims**:** water trading; and HARP DPC management costs.
- **UUW63** provides details of our wastewater treatment enhancement claims: final effluent; and investigations.
- **UUW64** provides details of our wastewater overflows enhancement claims: overflows and Advanced WINEP; and flow and EDM.
- **UUW65** provides details of our other wastewater enhancement claims: rainwater management; coastal and river erosion; sewer flooding; first time sewerage; supply and demand; wastewater reservoirs; and green recovery.
- **UUW66** provides details of our bioresources enhancement claims: preparatory works for alternative outlets; Improving resilience in biosolids recycling to agriculture; and WINEP sewage sludge drivers.
- **UUW67** provides details of our cross-price control enhancement claims: power resilience; carbon net zero; and DPC management.

8.3 Overview

We are committed to providing the best value for money for customers. This means improving performance, delivering on our legal and regulatory obligations and the key priorities of customers, and strengthening the long-term resilience of our services, all at the most efficient cost, making best use of innovation and markets to deliver service improvements and new obligations in a way that secures best value for customers and the environment.

Figure 8-1 shows the principal deliverables contained within our business plan, with our £13.7 billion proposed totex estimated to deliver more than £35 billion[1] of added value for the North West and support more than 30,000 jobs. More detail on this value can be found in Chapter 6.

Figure 8-1 Delivering significant value through our plan



[1] Based on third party analysis from Arup: supplementary document *UUW36 – Total Value of the plan*

This chapter sets how we have used internal and external sources of challenge and insight to ensure that our plan is as efficient as possible, and that we have the capability and capacity to deliver it.

Our plan delivers stretching improvements in service for customers and the environment, targeting significant improvements in key areas such as storm overflows, sewer flooding and water supply interruptions, alongside frontier performance in pollution incidents by 2030 (as set out in Chapter 5), as well as wider environmental and social value (as set out in Chapter 6). A large proportion of these improvements are being delivered through our base programme[2], at a base totex that is within our assessment of efficient modelled costs.

Our enhancement expenditure delivers an ambitious environmental improvement plan that is substantially larger than ever before, principally driven by new legal and regulatory obligations. 96 per cent of our wholesale totex is mandatory spend, as set out in data table *SUM4*.

Table 8-1: Total expenditure by price control – reconciling pre and post frontier shift and RPE

£m (FY23 prices)	*Data table*	WR	WN+	WWN+	BR	Wholesale	Retail	Total
Pre frontier shift and RPE								
AMP8 Totex	*CW1a/ CWW1a/ RET1a*	786	3,172	8,095	1,002	**13,055**	689	**13,743**
Transitional investment	*CW12 / CWW12*	10	16	84		**109**		**109**
Accelerated Programme	*CW17 / CWW17*			199		**199**		**199**
Totex – pre-frontier shift and RPE		**795**	**3,187**	**8,378**	**1,002**	**13,363**	**689**	**14,052**
Frontier shift and RPE adjustment		(14)	(68)	(170)	(23)	**(275)**	(104)	**(379)**
Totex – post-frontier shift and RPE		**782**	**3,119**	**8,208**	**979**	**13,088**	**585**	**13,673**

Table 8-1 shows total expenditure on a pre-frontier shift (FS) and real price effects (RPE) basis, as per the data tables referenced. An adjustment is then applied to arrive at the final business plan submission post-FS and RPE of £13.7 billion (inclusive of accelerated programme and transitional investment). All numbers referenced in this chapter are on a post-FS and RPE basis. This is the value that we are seeking to recover through price controls.

Table 8-2: Total expenditure (post-frontier shift and RPE) by price control

£m (FY23 prices)	*Section*	Water resources	Water network +	Wastewater network +	Bio-resources	Wholesale	Retail	Total
Base costs	*8.7.1*	412	2,281	2,164	476	**5,332**	585	**5,917**
Cost adjustments	*8.7.2*	186	-	85	173	**444**	-	**444**
Base totex	***8.5 / 8.6***	**598**	**2,281**	**2,249**	**648**	**5,777**	**585**	**6,362**
WINEP – overflows		-	-	3,089	-	**3,089**	-	**3,089**
WINEP – other		105	-	2,305	195	**2,606**	-	**2,606**
DWI obligations		-	379	-	-	**379**	-	**379**
WRMP interventions		77	405	-	-	**482**	-	**482**
DWMP interventions		-	-	306	-	**306**	-	**306**
Other key priorities		1	54	259	135	**450**	-	**450**
Enhancement totex	***8.8***	**184**	**838**	**5,959**	**331**	**7,311**	**-**	**7,311**
Totex (net)		**782**	**3,119**	**8,208**	**979**	**13,088**	**585**	**13,673**

[2] 'UUW30 - Performance commitments technical document' sets out the levels of performance being delivered through base and enhancement respectively for each of our performance commitments

The above table sets out totex by price control. More information on the individual price controls can be found in supplementary documents *UUW55: Retail Business Plan*, *UUW56: Wastewater Business Plan*, *UUW57: Water Business Plan*, and *UUW58: Bioresources Business plan*.

Water resources base costs are broadly in line with the AMP7 FD. Enhancement totex relates to our obligations under the WINEP, the need to improve resilience in areas with raw water quality deterioration, and enabling works for future national water trading. We include one cost adjustment claim reflecting that our higher reliance on reservoirs means we are disproportionately impacted by the increasing costs of reservoir dam maintenance. More information is set out in section 8.7.2.

Water network plus base costs are broadly in line with the AMP7 FD. Enhancement totex largely relates to installation of smart metering, re-lining the Vyrnwy aqueduct, targeted mains replacement to reduce leakage, lead pipe replacement, security upgrades required under new directives, and reducing greenhouse gas emissions.

Wastewater network plus base costs are £48 million higher than the AMP7 FD, largely driven by higher ongoing opex as a result of our AMP7 enhancement programme. AMP8 enhancement totex primarily relates to our obligations under the WINEP, including the requirement to significantly further reduce the use of storm overflows, with other enhancement programmes to support new homes, manage rainwater, improve power resilience, protect against coastal and river erosion, and reducing greenhouse gas emissions. We include one cost adjustment claim for our higher ongoing phosphorus removal costs, and one conditional cost adjustment claim to reflect the combined effect of urban rainfall and combined sewers making our drainage system more susceptible to flooding, as set out in section 8.7.2.

Bioresources base costs are £55 million higher than the AMP7 FD, largely driven by growth in raw sludge production. Stretching cost forecasts will absorb growing cost challenges from reducing income from energy incentives, increasingly constrained agricultural landbank for biosolids recycling, and increasing waste permit compliance standards. Enhancement totex relates to our obligations under the WINEP, improving the resilience of biosolids recycling to agriculture, preparatory work for alternative outlets for biosolids disposal, and reducing greenhouse gas emissions. We include one cost adjustment claim for compliance with the Industrial Emissions Directive at anaerobic digestion sites, as set out in section 8.7.2.

Household retail totex of £585 million is £677 million in nominal terms[3]. This is £187 million higher than the AMP7 FD, largely driven by the impact of significant AMP7 inflation on our ongoing cost base, and higher forecast bad debt costs as a result of the impact of the necessary bill increases on a region with high levels of deprivation.

We are committed to pursuing opportunities that can be delivered by direct procurement for customers (DPC) where it is in the best interests of customers and the environment. We are already delivering the flagship AMP7 DPC scheme (the Haweswater Aqueduct Resilience Programme, HARP). We have identified a bundle with total project value of £269 million and a further £344 million project that we believe will be eligible for DPC delivery, both subject to agreement with the EA to amend the regulatory dates associated with the schemes. Together, this would be a further £613 million to be delivered by DPC across AMP8 and AMP9, in addition to the over £1 billion expected value of the HARP scheme. Net of DPC management costs, this is an additional £557 million on top of the net totex shown in Table 8-2. More detail can be found in section 8.9.5.

We want to make an early start on key AMP8 deliverables and the requirements of our WINEP to deliver benefits for customers and the environment as soon as possible. We have supported government accelerations including Green Recovery during AMP7, and have proposed £197 million of the £1.5 billion provisionally approved in the accelerated infrastructure delivery project[4] to be invested during AMP7, and a further £107 million transition investment, giving a total of £304 million of our AMP8 plan to be delivered in AMP7 as set out in section 8.11.1.

[3] There is no inflationary uplift for the household retail price control, therefore it is more appropriate to consider costs in nominal terms than in a FY23 price base

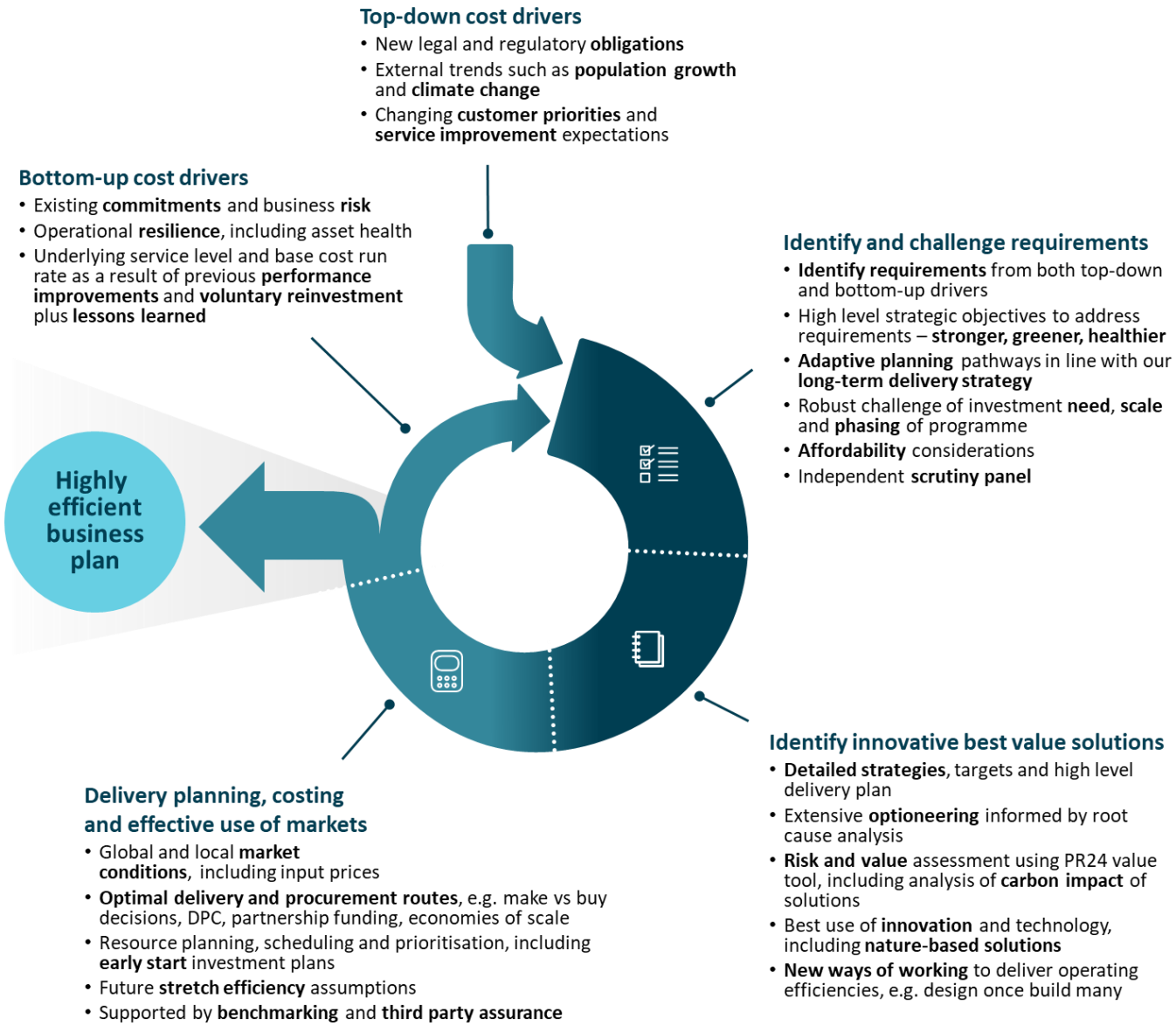
[4] ofwat.gov.uk/ofwat-gives-go-ahead-to-accelerate-schemes-totalling-2-2bn/

8.4 Our approach to creating the best value plan

The investment that we undertake is largely funded by customers – either on a 'pay as you go' basis for ongoing operating costs, or to pay for the financing cost of money raised to make capital investment required to enhance assets and improve services for customers and the environment. We are acutely aware of the imperative to spend customers' money wisely, particularly given the scale of investment required to meet new obligations in AMP8 and beyond.

Figure 8-2 shows the process we have undertaken to build our business plan for the 2025-30 period (AMP8), and how we have used internal and external challenge and insight to drive ambitious levels of efficiency into our plan at every step to ensure we are achieving the best value for money.

Figure 8-2 Our approach to creating the best value plan



This approach is summarised below, and full details can be found in the supplementary document *UUW45: Our approach to deliver best value totex*. This iterative process has allowed us to challenge, refine and optimise our plan, embedding ambitious efficiency targets into our proposed costs. On top of the efficiencies in our PR19 plan, we have identified an additional £411 million of efficiencies in AMP7, we are driving a further £708 million of savings into base wholesale totex in AMP8, and £24 million[5] into retail totex. From initial high level engineering

[5] Retail efficiencies of £26 million in section 8.6 are quoted in nominal price base and therefore slightly higher than this.

estimates of our enhancement programme, as set out in our January 2023 WINEP letter to the EA and using a bottom-up build using cost curve data for non-WINEP projects, we have driven a £2.9 billion reduction in proposed costs. These targeted cost reductions are summarised in Table 8-3 and described in sections 8.5, 8.6.3 and 8.9.

Table 8-3 Efficient cost reductions included in our plan

£m (FY23 prices)	*Section*	AMP7	AMP8 Base	Enhancement	Total
Additional efficiencies identified and applied in AMP7	*8.5.1*	411			411
Robust challenge of need, scale and phasing	*8.9.1*			1,581	1,581
Innovation and optimisation of solutions	*8.5.3 / 8.9.2*		333	830	1,163
Robust cost challenge and use of markets	*8.5.4 / 8.9.3*		375	376	751
Household retail efficiencies	*8.6.3*		24		24
Partnership funding contribution	*8.9.4*			95	95
Efficient cost reductions embedded into our plan		**411**	**732**	**2,882**	**4,025**

Source: UUW business plan estimates

Our process started with understanding the drivers of costs and robustly challenging AMP8 investment needs. This included engaging in constructive dialogue with regulators on delivery dates for meeting new statutory obligations, and using adaptive planning as part of our long-term delivery strategy to defer decisions and manage uncertainties in a smarter way. We also appointed an independent scrutiny panel to provide challenge and oversight of the largest AMP8 cost driver – our WINEP. Through robust challenge of the need, scale and phasing of investment, we have reduced our enhancement programme by £1.6 billion from our initial estimates, as set out in section 8.9.1.

We then developed effective strategies for meeting our requirements and conducted extensive optioneering, including innovative technology and new ways of working, blue/green and hybrid solutions. We assessed the options to identify the best value solutions, looking at whole life cost and wider environmental and social value. Through innovation and optimisation of solutions, we are targeting to deliver £1.2 billion of efficiencies across the plan, with £333 million in our base wholesale totex as set out in section 8.5.3, and £830 million in our enhancement programme as set out in section 8.9.2. There are instances where the best value solution may not be the cheapest option, for example where significant natural capital benefits far outweigh a slightly higher cost, or the carbon cost of the cheapest solution is too high, but in the majority of cases the solution with the best value ratio was also the lowest cost option.

Once the optimal solution had been identified, we determined the most effective delivery plan and procurement routes to maximise efficiency, including alternative delivery mechanisms such as DPC and partnership co-funding. Through robust cost challenge and effective use of markets, we are stretching ourselves to achieve £751 million of efficiencies across the plan, with £375 million in our base wholesale totex as set out in section 8.5.4, £376 million in our enhancement programme as set out in section 8.9.3, and £95 million of partnership funding opportunity as set out in section 8.9.4. Detailed cost estimates were developed, in line with the selected delivery routes, with efficiency assumptions built into the costs to reflect the savings we are targeting, and we used cost benchmarking analysis and third party assurance to ensure we are proposing a highly efficient plan.

8.4.1 The circular nature of efficiency

As can be seen in Figure 8-2, the investment we make in one AMP - enabling improvements in performance, addressing risks and improving resilience - feeds into the bottom-up cost drivers for future periods. The transformation we have delivered in AMP6 and AMP7 means we have a much smaller gap to close than we otherwise would have in order to deliver the level of service we need to in AMP8.

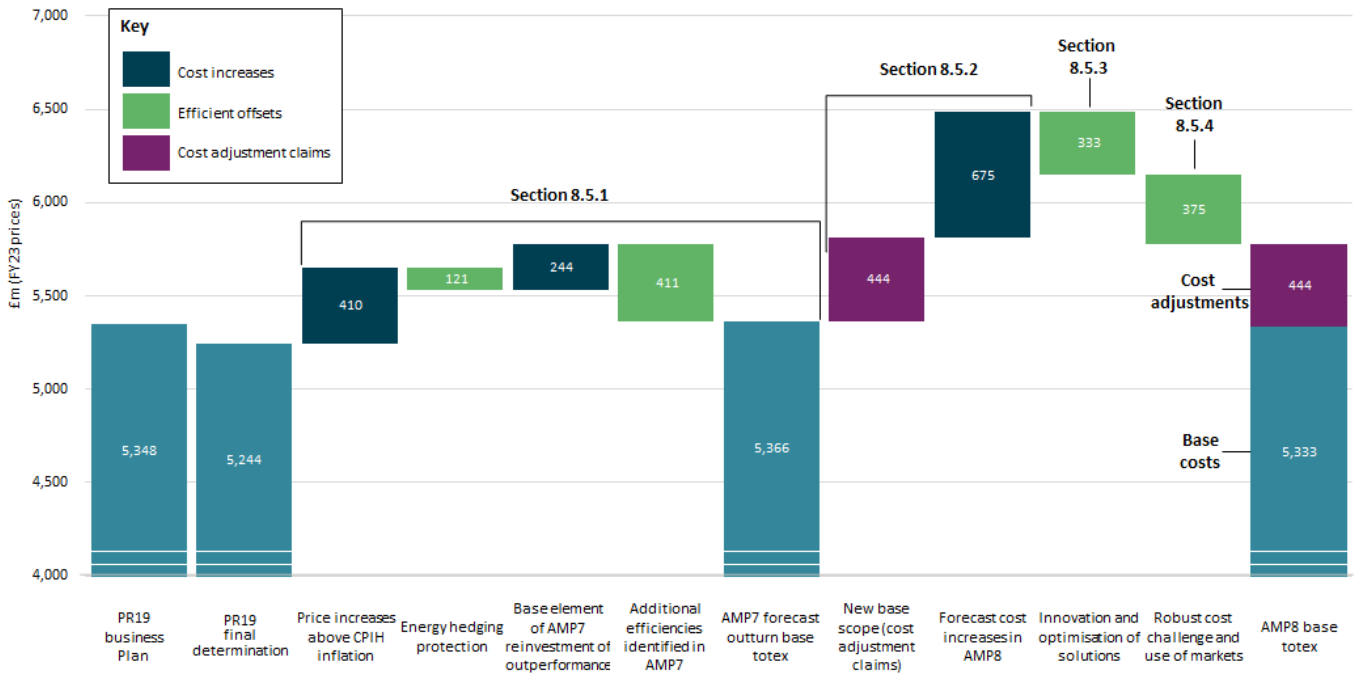
During AMP7 we have chosen to make £500 million of voluntary reinvestment – £250 million to accelerate improvements for customers, and £250 million in response to the emerging requirements of new legislation, such as the Environment Act 2021 and Industrial Emissions Directive, so we could begin working on these environmental improvements as quickly as possible. This responsible decision has helped to reduce the top-down cost drivers going into AMP8, although these remain significant as we are facing an unprecedented level of new environmental investment requirements in AMP8.

Just as the investment we have made in previous periods has helped improve efficiency for AMP8, by improving resilience and exploring innovations in AMP8 that help us to drive further performance improvements and protect the health of our assets, we will be better positioned to deliver for customers as we go into AMP9 and beyond. This demonstrates the importance of long-term planning and focusing on the lowest whole-life cost solutions. By following this approach, and investing customers' money wisely, we are delivering an efficient plan in AMP8 and driving sustainable efficiency for the long term.

8.5 Efficient wholesale base totex

Our AMP8 plan delivers significant performance improvements from base expenditure. As can be seen in Figure 8-3, in order to offset the incremental costs to deliver this improved service, we are targeting £1.1 billion of efficiencies in AMP8 and AMP7 (on top of those included in the FD). This will help us achieve a higher level of value for money, with superior performance for customers and the environment being delivered at a base totex level that is slightly lower than our forecast actual AMP7 botex, in real terms excluding areas of material scope increase reflected in our cost adjustments claims.

Figure 8-3 - Efficiency savings identified in wholesale base totex



8.5.1 Exiting AMP7 at a highly efficient baseline

Over the course of the last decade we have made significant strides in both performance and efficiency, and our PR19 plan identified over £1 billion of efficiencies through innovation, market engagement and cost challenge. This was one of the most efficient plans in the sector, demonstrated by the fact that we were assessed as a fast track company and given one of the lowest cost challenges from Ofwat, with our FD allowance for wholesale base totex only marginally lower than our business plan proposal.

In every business plan period there is a level of inherent risk – both downside and upside – and we have robust risk management policies, procedures and controls in place to ensure we can maintain operational, corporate and financial resilience through these highs and lows. We adapted our plans and had confidence in our ability to deliver our performance commitments within the FD allowance.

Since the start of AMP7, however, the world has experienced a level of volatility that goes far beyond the typical level of business risk and we, like others across multiple industries, have been faced with unprecedented levels of unanticipated cost as a result of external macro events.

Price increases above CPIH inflation

The volatile high inflationary macro-economic environment has driven significant cost increases both for households and businesses across the UK. Inflation has reached 30 year highs and whilst our regulatory allowance is uplifted in line with CPIH inflation, this has not matched the cost increases that we have experienced in the last three years. The impact of cost increases over and above CPIH inflation has been an additional £410 million on our AMP7 base costs (illustrated gross of the benefit we have obtained from energy hedging). In addition, population growth experienced in AMP7 has been more significant than our PR19 forecasts, leading to higher treatment and other operating costs. We have absorbed one-off costs such as the cost to adapt swiftly and effectively to lockdowns and other government-imposed restrictions and requirements during the Covid-19 pandemic.

Inflation volatility in the last three years has impacted some prices significantly more than others. While we recognise some areas with high increases (such as food and gas prices) have impacted customers whilst having little impact on our business, several of our most significant cost drivers have increased dramatically more than CPIH.

- **Construction costs:** Construction is a major component of costs for our business, with our large capital delivery programme. In the six months following the start of the conflict in Ukraine, steel increased by 64 per cent, fuel by 43 per cent, timber by 23 per cent, and concrete/plastic products by 17 per cent. We monitor a blended index made up of 49 separate indices, weighted to reflect a typical United Utilities construction project – the 'Construction Industry Basket of Goods' (CIBOG) index. As shown in section 2.4 of supplementary document *UUW50: Ensuring value for customers through use of markets*, the price of delivering construction projects has risen significantly more than the growth in CPIH during AMP7, with CIBOG growth reaching a high of 14.2 per cent in April 2022 when CPIH growth was 9.4 per cent. This represents an almost 50 per cent greater increase in the costs of our typical construction projects.
- **Energy costs:** Energy is another significant cost driver, making up 17 per cent of AMP7 opex excluding IRE, as our core activities are highly energy-intensive. There has been extreme volatility in the energy markets during AMP7, with substantial increases far exceeding CPIH inflation as set out below. It is estimated that the unhedged impact of these price increases would have been around £280 million.
- **Materials and chemicals:** Materials and chemicals comprise 14 per cent of AMP7 opex excluding IRE. Both have increased by more than inflation during AMP7. For instance, our chemicals costs increased by more than 70 per cent between 2021/22 to 2022/23. Many of the chemicals we rely on for water and wastewater treatment are energy-intensive in their production, therefore the material spike in energy costs has also contributed to above-CPIH increases in the price of chemicals.

The remaining elements of opex have also overall increased by more than CPIH, with some above and some below. Property rates and regulatory fees (around 18 per cent of the total) have increased by more than CPIH. Our employee costs (26 per cent) are expected to have increased broadly in line with CPIH over AMP7 in total. Our contract partner spend and bad debt charge have risen by less than CPIH, although there is no inflation allowance for bad debt as this sits within the retail price control.

Energy hedging protection

Recognising that electricity commodity prices can be volatile, we have had an active risk management strategy in place for over 15 years, monitoring daily market data and forward-purchasing power in the physical and financial markets to reduce commodity price risk.

We have still unavoidably experienced significant increases in energy costs, but our hedging policy has provided significant protection during AMP7. For example, in 2022/23 our total retail energy costs were 30 per cent higher than previous years with a weighted average commodity price of £91 per MWh, while the retail energy markets experienced highs of over £600 per MWh and average prices have increased by more than 200 per cent. Our policy of 'averaging in' means that there is a delay in the timing of us experiencing the impact of sustained higher prices, so we expect our energy costs in 2023/24 to be higher than we experienced in 2022/23 – our average hedged price in 2023/24 is £110 per MWh.

We estimate that the protection we have achieved through effective energy hedging will have mitigated rising energy costs by around £121 million during AMP7.

AMP7 reinvestment of outperformance

At the same time as we experienced significant cost pressures, public interest in the natural environment has also been growing – in particular, concerns around the health of rivers across the country and the impact of storm overflows. This led to the introduction of the Environment Act 2021 with significant new obligations for water companies targeting spill reductions at overflows as well as tightening standards around phosphorus and nutrients. Our environmental performance is strong and our plan already included a programme of work to improve rivers across the North West, but there were clear new drivers – both legislative and customer priorities – to deliver more improvements at a faster rate.

In response, we made the responsible decision to invest more so that we could deliver improvements faster. Of the £765 million we committed to spend above the AMP7 FD allowance, £265 million of this was approved by regulatory mechanisms including Green Recovery and our Bolton WINEP scheme, with the remaining £500 million was voluntary investment to accelerate customer and environmental improvements. We also have approval to commence work early on our AMP8 expenditure on improving overflows. As a result, the performance we are delivering for customers and the environment over AMP7 will improve significantly, giving an improved base service level, and contributing to our targeted 60 per cent reduction in the use of storm overflows by the end of AMP8. This will still represent a significant piece of work going forwards, in AMP8 and beyond, but our voluntary commitment has delivered a good first step. While a significant amount of our additional investment is enhancement, it has increased our base expenditure by £244 million in AMP7.

Additional efficiencies identified in AMP7

In addition to the significant efficiencies included in our PR19 business plan, we have continued to robustly challenge our costs on an ongoing basis and have identified a further £411 million of incremental cost saving opportunities that we are targeting in AMP7, helping to mitigate overspend and ensure we are operating at the most efficient run rate possible as we enter AMP8.

- **Cost review:** Through the cost review we have undertaken in preparation for AMP8, we have identified a number of areas of saving as set out in section 8.5.2. We have begun implementing these straight away to deliver the benefits earlier, targeting £272 million of savings in the remainder of AMP7, including £150 million of incremental value engineering opportunities, delivering leaner solutions at a lower cost.
- **Project Crystallise:** As discussed in section 4.6 of supplementary document *UUW50: Ensuring value for customers through use of markets*, we have conducted a bottom-up review of initiatives aligned to our market engagement ambitions, which is targeting AMP7 efficiencies of £34 million. We have commissioned a third party, Barkers Commercial Consultancy, to act as delivery partner and ensure the outcomes are achieved, and we will apply our learnings to drive further market efficiencies in AMP8, as set out in section 8.5.4.
- **Other:** The remaining cost savings will be delivered through various other targeted opex efficiencies we have identified, including power efficiency optimisation and our networks and digital transformation programmes.

8.5.2 Forecast cost increases in AMP8

Base expenditure is impacted by changes in what we must deliver, and changes in the cost of delivery.

Where materially higher costs are driven by increases to the scope of what we expect to be included within base expenditure, we have submitted well-evidenced cost adjustment claims for these, as set out in section 8.7.2.

Excluding these we estimate that, before applying further efficiencies, it would cost an additional £675 million over AMP8 to deliver our services and achieve the increasingly stretching performance levels included in our plan.

Changes in the cost of delivery

The regulatory framework allows for wholesale cost increases in line with CPIH inflation, which itself assumes a level of efficiency as inflation reflects the productivity improvements being made across a number of industries. Component parts of the inflation index have growth rates that can diverge significantly from the average, as we have seen during AMP7, leading to real price effects that will impact our costs.

As can be seen in section 5.4 of supplementary document *UUW50: Ensuring value for customers through use of markets*, SmartCube[6] forecasts annual growth rates for some of our key spend areas in AMP8 – materials, plant and equipment prices are forecast to grow by 3.40–3.45 per cent, chemicals by 3.45–3.55 per cent, and labour costs by 3.77–3.82 per cent – higher than the around 2 per cent assumption for CPIH (which the Bank of England expects by late 2024).

As discussed in section 8.5.4, we have applied stretching efficiencies in our plan through robust cost challenge and effective use of markets. As a result, we have assumed that we will be able to beat these external assumptions of price increases in AMP8 and our real price effect assumptions for chemicals, labour, and materials, plant and equipment, set out in SUP11 of supplementary document *UUW93: Business plan data tables*, reflect cost movements much closer to CPIH inflation. Even including these efficiencies, we anticipate a real increase in base opex input prices of more than £110 million in AMP8, relating predominantly to energy. There are also additional above-inflation cost increases, such as business rates where the anticipated real cost increase as a result of two revaluations during AMP8 is expected to be around £150 million.

As discussed in section 8.7.1, the potential that energy prices may fall during AMP8 would not result in costs lower than AMP7 for companies with appropriate and prudent hedging policies, as hedged electricity products have become more expensive. As shown in figure 17 of supplementary document *UUW46 - Cost assessment proposal*, our forecast power costs are higher in 2023/24 than 2022/23 (as our hedging policy has delayed the impact of price rises) and energy costs are expected to remain high throughout AMP8 compared to our base year (2022/23) costs.

Changes in what we must deliver

The work that needs to be delivered through base expenditure in AMP8 has increased as a result of bottom-up and top-down cost drivers, including:

- **Increased ongoing costs of maintaining and operating assets following AMP7 enhancements** – for example, our AMP7 WINEP tightened permit levels at a number of wastewater treatment works, requiring materially higher levels of chemicals and ongoing treatment in the final years of AMP7 and into AMP8 and beyond;
- **Costs of increased treatment for water and wastewater following population growth** – as set out in Chapter 2, the North West population has grown by 8.6 per cent since 2002 and we expect further growth of around 1 million people by 2050, with increasing demand expected to be concentrated in high growth areas, which has an impact on base costs as well as enhancement expenditure;
- **Growing expectations of customers and regulators for improving performance levels** – as discussed in section 8.7.1, the catch-up efficiency challenge and frontier shift expectations impose more and more stretch in our performance commitment level targets, and customer priorities can change over time. As discussed in Chapter 5, we are targeting significant service improvements for customers and the environment in AMP8, with much of this being delivered through base expenditure. For example, the 25 per cent reduction in pollution incidents and improvements we are proposing to bathing waters will both be delivered entirely from base expenditure, as will the vast majority of the 32 per cent improvement we are proposing on internal sewer flooding performance. Supplementary document *UUW30 - Performance commitments technical document* sets out for each of our performance commitments the levels that are being achieved through base and enhancement expenditure respectively.

[6] SmartCube is an independent third party that provides custom research and advanced data analytics.

Targeting efficiencies to offset these increased costs

We have sought to mitigate the impact of cost increases on customer bills by identifying significant potential cost savings in other areas, which would see us operating at an improved level of efficiency in our base expenditure. We set these out in sections 8.5.3 and 8.5.4 below. In order to help identify efficiency opportunities and streamline our ways of working in readiness for delivery of our ambitious AMP8 programme, we undertook a rigorous top-down review of our costs and activities with independent input from Alvarez and Marsal (A&M) – a global restructuring firm with a strong mix of engineering, operations, digital and business services expertise, and experience in operational transformation across a range of industries.

The review was comprehensive across the business with no area out of bounds, but we focused on the areas where we spend the highest amounts, including our capital delivery programme, engineering and commercial, to maximise value. Other targeted areas of focus included digital services, fleet and property. We identified opportunities across our AMP8 plan to tighten our cost estimates without compromising on service, including:

- Value engineering opportunities of around £950 million (across base and enhancement) – as set out in sections 8.5.3 and 8.9.2 respectively;
- Network call out productivity opportunities of £96 million – as set out in section 8.5.3; and
- Digital services opportunities of £116 million; operating model re-structuring opportunities of £98 million; and fleet rationalisation opportunities of £4 million – as set out in section 8.5.4.

8.5.3 Innovation and optimisation of solutions

The extensive optioneering we have conducted in building our AMP8 programme includes a large number of innovative ideas and new ways of working, including emerging technology and nature-based solutions, allowing us to optimise the preferred way of meeting our requirements from a broad range of alternatives. We embrace the opportunities presented by advances in technology and new ways of working, and our core values – do the right thing, make it happen, and be better – drive an innovative culture across our business. We use a variety of methods to find novel ideas and solutions from different sources, internally and externally, including idea scouting, our Innovation Lab, and learning from other industries and across the world. We have a strong track record and have been involved in successful bids to influence over £90 million of projects as part of Ofwat's AMP7 innovation fund, leading on seven projects (around 25 per cent of all awarded funds), including the Catchment Systems Thinking Cooperative, where we are working with others to revolutionise the way crucial data about the water environment is shared, with a particular focus on river health. More information can be found in supplementary document *UUW49: Innovation framework and strategy*.

Through innovation and optimisation of solutions, we have included an ambitious £333 million efficiency challenge in our AMP8 base programme.

Value engineering solutions

Our programme optimisation strategy challenges asset standards and seeks lean designs that deliver targeted outcomes in the most efficient way, enabling us to achieve cost savings without compromising on effectiveness. We are targeting an ambitious 10 per cent efficiency through value engineering in AMP8, saving £163 million on our base capital expenditure.

Our approach focuses, for example, on ensuring building size is appropriate for its use to avoid unnecessary heating and lighting costs, ensuring we are engaging the right suppliers, and avoiding duplication of activity such as additional assurance when adequate contracted arrangements exist with suppliers. Our AMP8 plan takes value engineering to an improved level, changing our delivery model to optimise the way we design by employing a 'design once, deploy many' approach, with standardisation of assets to maximise the benefits and avoid duplication of effort.

Optimising the way we work

We are continuously seeking additional efficiencies in the way we work, building on our systems thinking approach and drawing on best practice learnings from other top organisations. Our plan targets £113 million of savings from improving processes, training and upskilling teams, and embedding further best practice ways of working, including:

- **Operational excellence:** applying best practice learnings to help us improve performance, increase capacity, speed up customer response times, and reduce costs;
- **Automation:** utilising artificial intelligence to automate procedural but time-consuming tasks and reporting functions; and
- **Network teams:** optimising the triage of customer calls and increasing field team productivity through telematics to reduce private demand costs, and reducing repeat jobs with more in-depth root cause analysis.

The improved efficiency anticipated from this will also support our new leaner target operating model set out in section 8.5.4.

Innovation

We are continually tracking new technologies and innovative techniques to help deliver our services cheaper, safer, faster and better. In developing our AMP8 plan, we have applied learnings and efficiencies based on a variety of known innovations that have been developed and trialled ahead of the start of AMP8, and included a stretch efficiency target for as yet unknown innovations. We are targeting to deliver around £57 million of savings through these opportunities.

We have a strong track record as a leader in innovation and, where we have successfully proven innovations we seek to maximise the benefits these can deliver. As detailed in section 2.4 of supplementary document *UUW49: Innovation framework and strategy*, sniffer dogs have been effective in helping to detect treated water leaks in rural areas where leakage detection has traditionally been difficult, and we are looking to transition this into wastewater to help in identifying sewer mis-connections which could lead to river pollution. We also propose to expand the use of smart networks further in AMP8, applying our learnings in wastewater to our water network, and exploring the opportunity to deliver Dynamic Treatment Management, and ultimately work towards Dynamic Catchment Management, as detailed in section 2.2 of UUW49.

We have conducted 24 pilots to test the proof of concept for innovative new technology and ways of working ahead of AMP8, including mobile water treatment capabilities, partnering with other utilities to conduct home efficiency audits for customers, and VAPAR artificial intelligence technology. Through these pilots we worked with more than 20 partners, and made efficient use of more than £900,000 of partnership funding to support the trials. Many of these pilots have shown strong promise with initial positive success, and have been worked into our business plan, leading to a more efficient level of totex.

Case study: VAPAR

Our sector-first adoption of artificial intelligence to improve the efficiency and effectiveness when assessing wastewater network pipe condition is delivering savings in AMP7, and we have an AMP8 target to save a further £6 million.

We are now faster and more consistent than conventional methods – and have awarded a multi-year contract with VAPAR (scouted from our Innovation Lab programme) to use and optimise this new approach.

We have shared our results and others are also adopting this, contributing to a sector-wide improvement. More detail can be found in section 2 of supplementary document *UUW49 Innovation framework and strategy*.

8.5.4 Robust cost challenge and use of markets

Securing the most efficient cost means robustly challenging our internal costs to ensure we are operating with the highest levels of productivity, maximising the benefits offered by competitive markets, and ensuring we get the best value for money from our supply chain. Through robust cost challenge and effective use of markets we have stretched ourselves to achieve a total of £375 million of efficiencies in our AMP8 base totex.

Robust cost challenge

As detailed in section 8.5.2, we have undertaken a rigorous review of our costs and activities that identified £218 million of opportunities to increase our efficiency further in AMP8. For example:

- **Optimising our operating model:** using reduced agency resource and overtime, fewer people, and a different mix of skills better suited to deliver our AMP8 programme in the most efficient way, underpinned by other process improvements like operational excellence, set out in section 8.5.3.
- **Maintenance excellence:** aiming for a 20 per cent reduction in reactive maintenance costs with a shift towards proactive maintenance in AMP8.
- **Digital optimisation:** delivering a more future focused system architecture with opportunities to move data centres to cloud-based storage and strategic outsourcing opportunities, and maintaining fewer non-core apps across the business to reduce licence fees.
- **Rationalising our fleet:** looking to remove hired vehicles, making more efficient use of the vehicles we own, optimising their location for accessibility, using telematics and improving planning and scheduling of activities.
- **Customer engagement:** maximising opportunities to influence customer behaviour as a more effective and efficient long-term solution, such as helping to reduce the amount of fat, oil and grease (FOG) entering our sewers and creating blockages.

Best value for money from our supply chain

Ensuring our supply chain costs are as efficient as possible is a major driver in ensuring we are achieving the best value for money for customers.

Using competitive markets can deliver more value for customers where contractors bring greater experience and can deliver at a more efficient cost, and it can also give us a wider pool of innovative ideas. We adopt leading approaches in both our participation in and effective use of markets to maximise value and mitigate risk.

Significant external market pressures have affected global markets since 2020 and, supported by third parties, we have deployed a plethora of best practice responses to market conditions to find efficiencies, generate cost reductions, improve performance in AMP7, and ensure we are ready to deliver our AMP8 programme. We are focused on maintaining tight control and have extensive supply frameworks in place for critical equipment, materials and kit that allow us to lock-in pricing and secure supply.

As explained in section 4.11 of *UUW50 - Ensuring value for customers through use of markets*, in the first three years of AMP7 we have achieved cost savings through effective use of markets of £151 million. This represents 4 per cent of our third party spend over that period. We will maintain a continuous focus on optimising the use of markets, and are stretching ourselves to deliver a similar level of saving in AMP8. This could achieve market efficiencies of around £158 million on our base programme, as well as further savings in our enhancement programme as set out in section 8.9.3. Some examples of how we are aiming to achieve this are:

- **Maintenance sourcing:** in-house engineers managing the end-to-end process to expertly challenge the scope and cost of proposed work, and ensure we engage the best performing suppliers.
- **Batching and bundling:** using standardised assets and components increases the opportunities for economies of scale, and we are looking at opportunities to bundle programmes of work.
- **Runway delivery approach:** using multiple delivery pathways to reduce contractor indirect costs and give us a wider pool of contractors and ability to use more small local contractors.

Case study: Runway approach to capital delivery

Our AMP7 capital delivery model followed a design and build strategy, whereby we produce the requirements and the contractor assumes design responsibility and risk. This meant heavy reliance on Tier 1 contractors. Since we established this model, macro-economic events have severely affected construction price inflation and availability of equipment, material and resources, we have seen a more risk averse appetite from the supply chain (particularly since the collapse of Carillion in 2018), and the construction market is buoyant with competing infrastructure programmes offering a more attractive risk profile and higher margins. As a result, contractors are either choosing not to bid for work in the water sector or pricing risk at a significant premium, with a steady escalation of the percentage of indirect costs being charged, particularly by Tier 1 contractors.

In response, we have moved to a new procurement operating model that makes use of multiple delivery runways with varying levels of involvement in design (including build only, DPC, nature-based specialists, and partnerships) with multiple delivery partners appointed to each runway. This means we have less reliance on Tier 1 contractors, and can make more use of the lower tier markets that have lower overheads and more competitive indirect costs. This has already begun yielding good savings, and forms the basis of our AMP8 plan.

This approach better assigns risk with those best placed to manage it. Different delivery pathways transfer different levels of risk to the contractor. For instance, following our 'design once, deploy many' approach and preference for standardised components and assets, it is more effective for us to use design centres to create repeatable designs, and more efficient for us to drive procurement, meaning a build-only delivery is the most suitable and offers the best value for money. As a result, we will be assuming different levels of risk across different programmes of work, and our plan ensures efficient risk allocation. Working with Mott MacDonald, we developed differing associated indirect costs and risk percentages to apply against each delivery route to ensure risk is priced in at the most efficient rate. Arup reviewed and agreed with the logic of our approach to pricing risk, although it did raise some concerns that it is at the lower end of the acceptable range it would expect.

As well as increased value for money, this approach will offer additional benefits for us and for the North West, with increased supply chain capacity, bringing in new partners with a spread of second-tier suppliers, and supporting smaller local contractors as well as developing new workforce skills in the region.

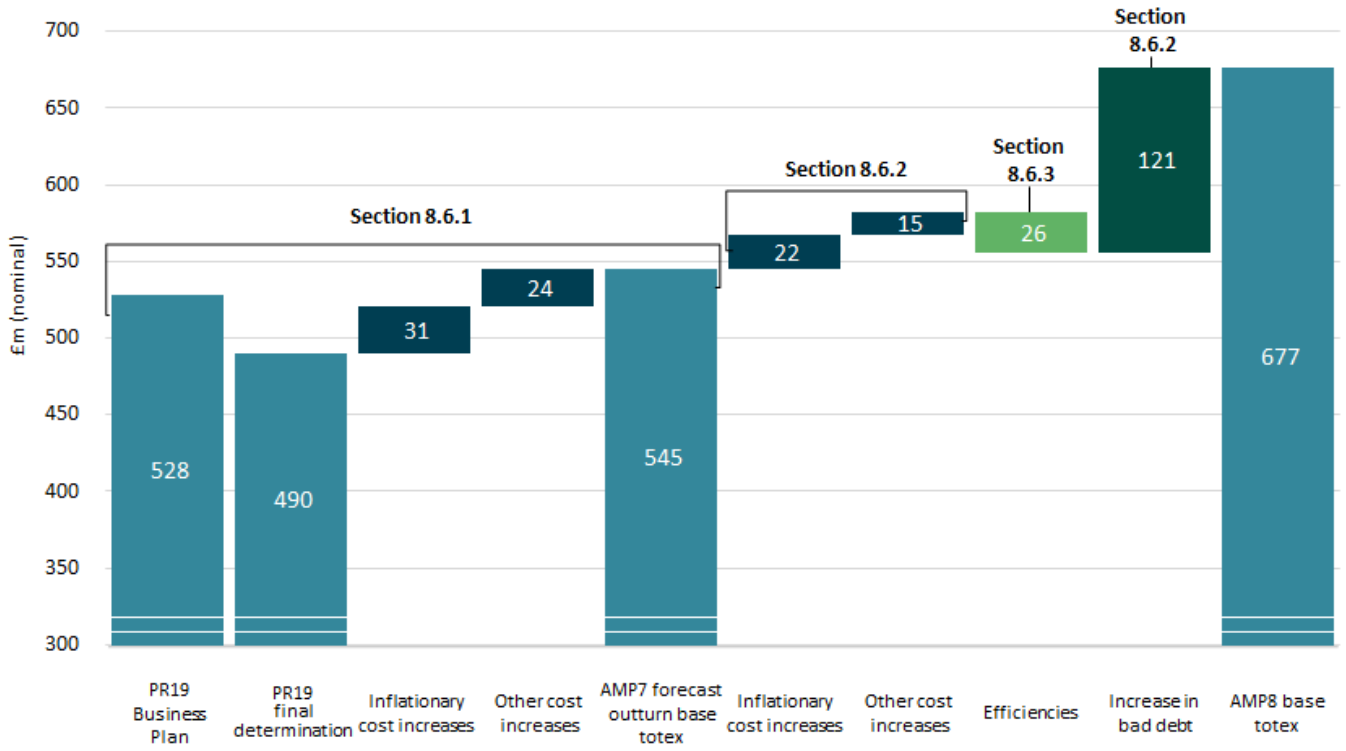
We also support competition within the non-household retail market, continually working to improve the service that we provide to retailers and non-household customers. More information can be found in *UUW59: Supporting the NHH Market*.

8.6 Delivering efficient retail cost to serve

As well as driving significant performance improvements and efficiency savings for customers through our wholesale activities, we are committed to delivering a leading retail service for household customers at the lowest sustainable cost to serve.

Figure 8-4 below shows the additional cost increases experienced during AMP7, bridging this to our proposed retail costs for AMP8. This is presented on a nominal basis, as there is no inflationary allowance in the household retail price control, and therefore the AMP8 total cost of £677 million differs from Table 8-2 and the efficiencies of £26 million differs from Table 8-3, both of which are deflated to FY23 price base to align with the presentation of wholesale costs.

Figure 8-4 – Cost increases and efficiency savings in household retail (nominal)



8.6.1 AMP7 cost performance

As discussed in supplementary document *UUW55: Retail Business Plan*, with high levels of deprivation in the North West the scale of affordability and vulnerability challenges is greater than elsewhere in England and Wales, making it one of the toughest operating environments for a utility retailer.

Tackling doubtful debts is a significant driver for delivering an efficient retail cost to serve

As shown in Table 8-4 below, we have the highest levels of extreme deprivation in the industry.

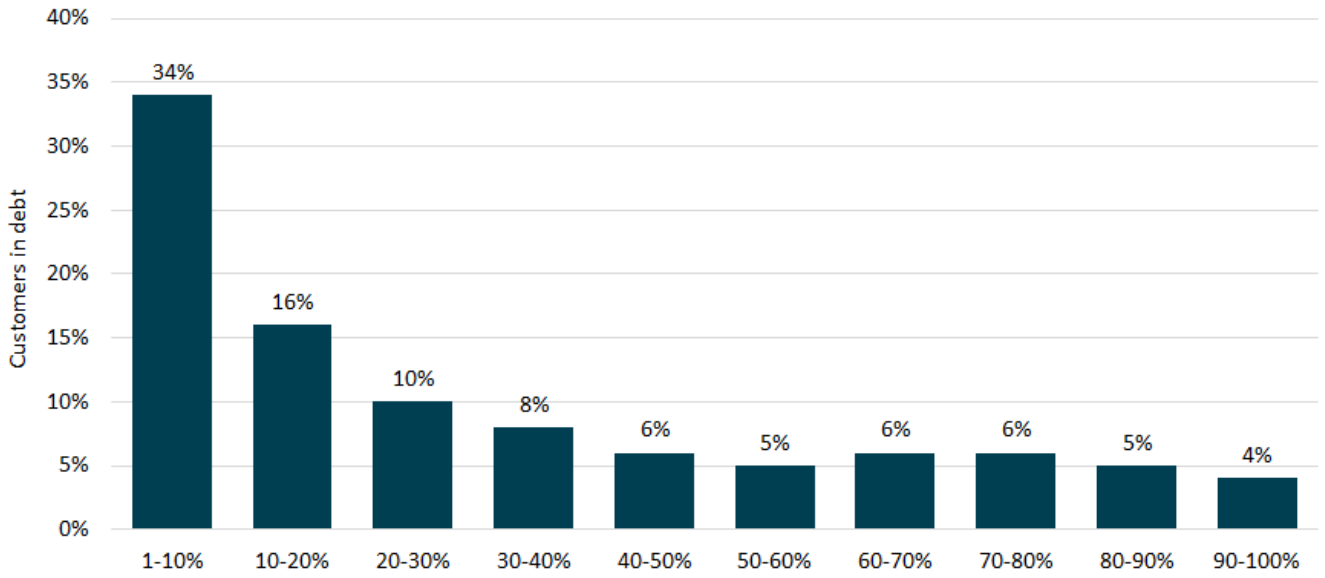
Table 8-4 - Percentage of most deprived LSOAs (neighbourhoods) by service area and decile for all English Water and Sewerage Companies

	United Utilities	Anglian	Northumbrian	Severn Trent	Southern	South West	Thames	Wessex	Yorkshire
1% most deprived	47%	8%	13%	9%	2%	1%	0%	0%	16%
5% most deprived	36%	6%	10%	18%	2%	1%	1%	0%	18%
10% most deprived	29%	7%	10%	20%	3%	2%	3%	0%	17%
20% most deprived	23%	8%	9%	18%	3%	2%	9%	0%	14%

Source: UUW analysis of indices of multiple deprivation

The make-up of our bad debt, shown below in Figure 8-5, shows a high concentration in the lowest income deciles. This demonstrates the strong correlation between deprivation and levels of bad debt, as recognised in Ofwat's cost modelling approach.

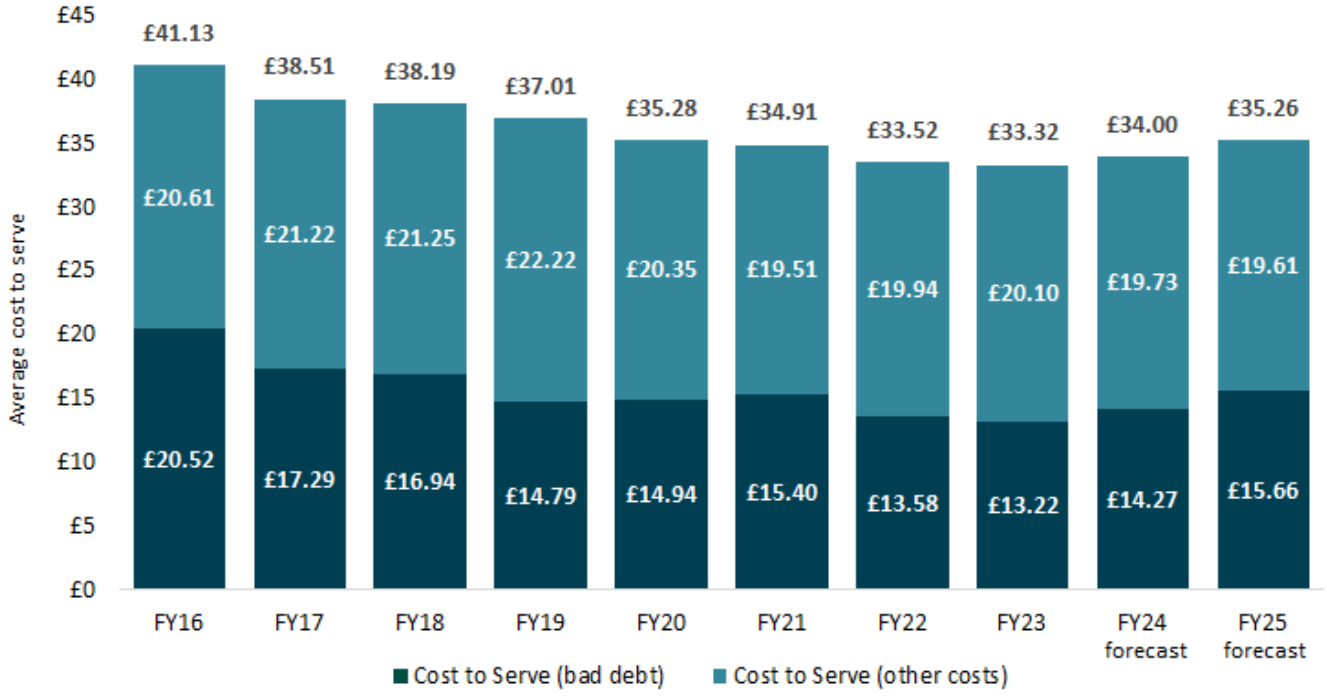
Figure 8-5 - Proportion of customers in debt for each income decile



Source: UUW data and indices of multiple deprivation

Despite this tough operating environment, as can be seen in Figure 8-6, we have delivered reductions in our underlying average retail cost to serve since the beginning of AMP6.

Figure 8-6 - Average household retail cost to serve performance

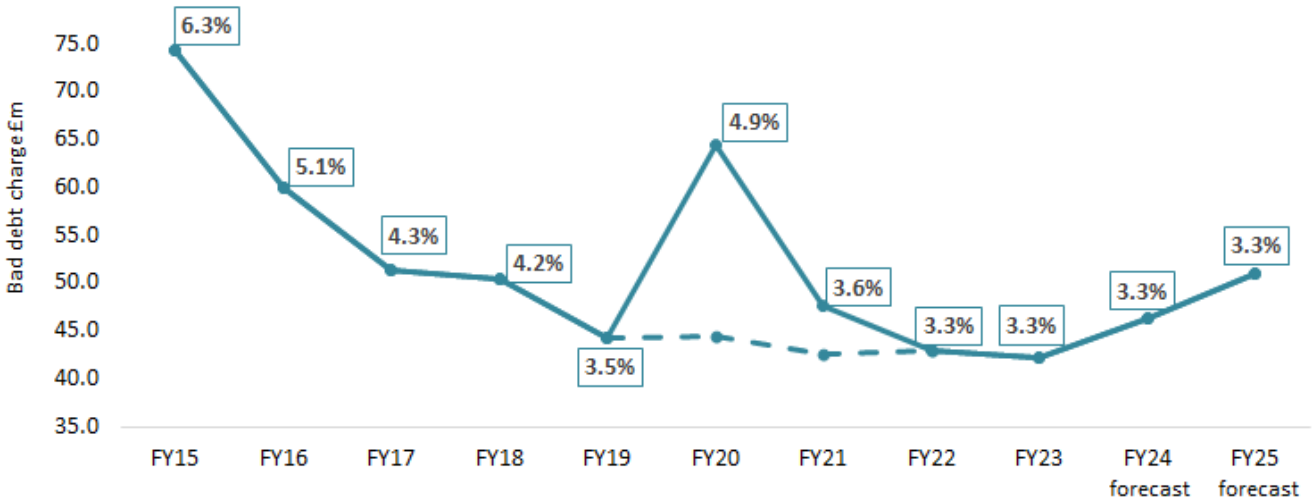


Source: Historic and forecast company performance

A large contributing factor to this improvement has been the reduction we have achieved in bad debt, shown in Figure-8-7. This shows our performance on household retail bad debt, with the labels representing this a percentage of regulated revenue, and the dotted line representing underlying performance in years with large provisions during the Covid-19 pandemic.

We have also made good progress in reducing the number of voids and gap sites, and more detail on how we have done this can be found in section 2 of supplementary document *UUW49 - Innovation framework and strategy.*

Figure-8-7: Household retail bad debt performance



Source: Historic and forecast company performance

Our reported bad debt charge of £42 million in 2022/23 was 3.3 per cent of regulatory household revenue, a significant reduction from 6.3 per cent in 2014/15. We forecast that it will remain at 3.3 per cent for the remainder of AMP7, albeit this will result in an increase in the value of the bad debt charge as a result of increasing revenue in these future years. The reduction in bad debts has been achieved by:

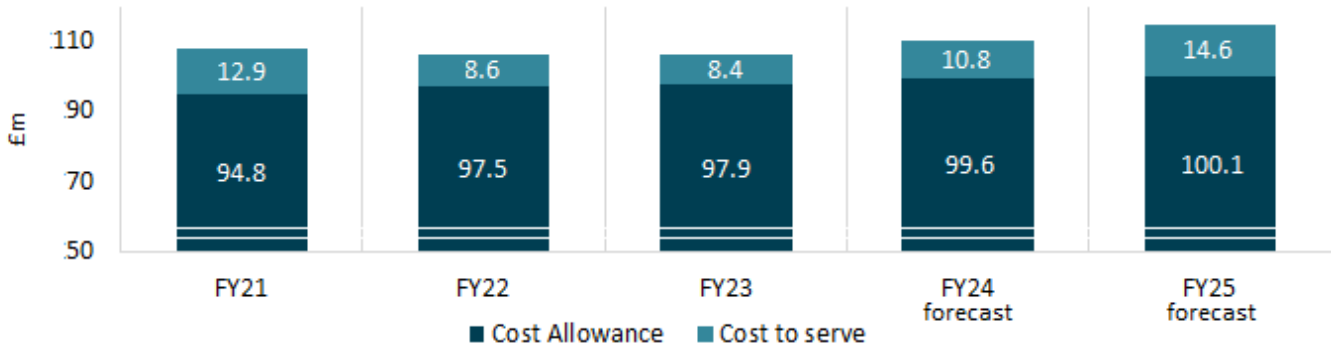
- Adopting a broad and comprehensive set of approaches to support customers that find it difficult to pay, with affordability support funded by customers that can afford it being matched by company-funded support through a range of schemes, including donations to the UU Trust Fund, contributions to social tariff discounts, and payment matching (as set out in supplementary document *UUW25 – Affordability and vulnerability operational response);* and,
- Effectively utilising a variety of prompts and sanctions for customers that 'won't pay'.

We have benchmarked our debt management activities against leading approaches from outside the water sector. Working with external debt management experts over a number of years we have made a step change improvement in the way we manage outstanding household debts. We recognise that we have high debt management costs, which is a natural consequence of high deprivation and higher bills. In this context, our performance on bad debt is consistent with sector-leading debt management.

Further cost challenges experienced in AMP7

A number of factors have challenged all retailers since 2020, including COVID-19, cost-of-living pressures, and exposure to higher than forecast inflation. As a result, despite our strong performance in reducing bad debts, our retail costs in the first three years of AMP7 have exceeded the regulatory allowance, and projections indicate that we will continue to exceed the cost allowance over the remainder of the AMP, as shown in Figure-8-8.

Figure-8-8: AMP7 retail cost allowance performance (outturn, actual and forecast)

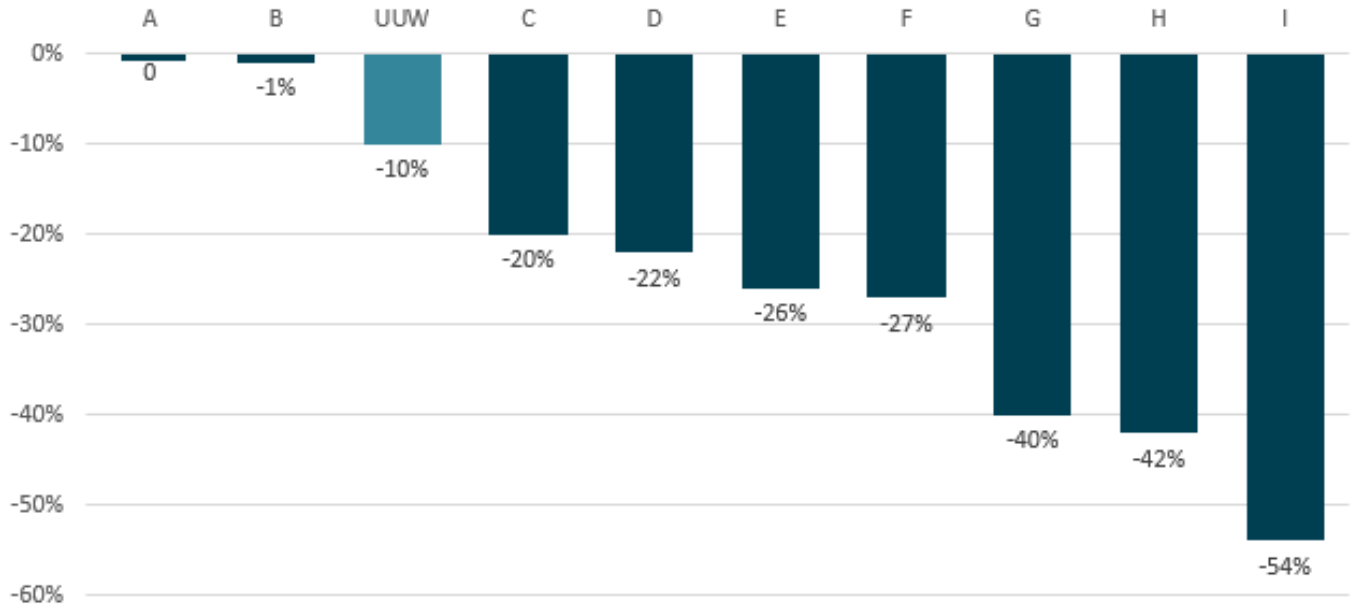


Source: Historic and forecast company performance

In total over AMP7, we forecast costs of £545 million, which is £55 million higher than the £490 million allowance. £31 million (56 per cent) of this is due to inflation rising above levels assumed at PR19 – with retail being a nominal price control, we have absorbed the extremely high levels of inflation during AMP7 without any allowed uplift to costs. In addition, cash collection rates have been slightly lower than anticipated at PR19, as the Covid-19 pandemic and cost of living increase have affected customers' ability to pay their bills. We have successfully mitigated much of the impact of these external factors and, excluding the inflationary impact, our costs are expected to be within 5 per cent of the allowance. This has been done whilst absorbing an efficiency challenge versus our PR19 cost submission, as shown in Figure 8-4, and whilst also protecting investment in core customer service, as a result of which we are a top four performer amongst our water and wastewater peers on C-MeX and are in the top five utility companies in the Institute for Customer Service scores.

These cost challenges have affected the industry as a whole, however our performance has been strong relative to peers, as illustrated in Figure 8-9. It is notable that we are performing favourably to the industry as a whole and to the company (company H below) that formed the efficient benchmark at PR19.

Figure 8-9: Comparative cost allowance performance (all WaSCs), cumulative so far in AMP7, as % of household retail cost allowance



Source: Company annual performance reports for the financial years 2020/21, 2021/22 and 2022/23

8.6.2 Anticipated cost increases in AMP8

The principal driver of increased costs in AMP8 is an increase in bad debt costs due to the proposed increase in average customer bills. In conjunction with our industry leading debt collection practices, our extensive affordability support programme will be expanded to mitigate as much as possible the impacts of this bill rise. However, given the high levels of deprivation in the North West, we do anticipate some deterioration in collection performance and, as revenues are increasing, this will drive a corresponding £121 million increase in bad debt cost (£351 million AMP8 versus £230 million AMP7).

In addition, we anticipate continuing inflationary pressures to drive cost increases into the retail price control. In particular, growing costs of labour, postage and energy prices will materially impact operating costs. From 2024/25 to 2029/30 we anticipate that input costs will increase by around £22 million.

The costs associated with investment in new digital capability will also be brought forward as a result of accounting changes related to use of Systems as a Service. This will result in a higher proportion of investment costs being reported as operating costs in AMP8 relative to AMP7. We anticipate that we will incur £9.5 million of additional cost as a result of this change, recognising that longer term depreciation will be reduced.

Over AMP8 an additional 500,000 household AMI meters will be installed. The increase in data received from AMI meters will require additional data capture and analytics capability that is expected to increase retail cost by £5 million. In total, anticipated cost increases in AMP8 amount to £158 million (before applying our targeted efficiencies).

8.6.3 Efficiencies targeted

Our strong relative performance to date has been possible as a result of many initiatives implemented in AMP7, and we will continue to challenge costs in AMP8. We are targeting an ambitious level of further efficiencies, which will help to partially offset the cost increases that are largely outside of our control.

We are targeting delivery of £26 million of efficiencies through ongoing initiatives such as our continued digital transformation, data-led void management, enhanced mobile app capabilities, extending paperless billing, streamlining processes through the use of robotics and generative artificial intelligence, data sharing and analytics, and maximising the benefits of partnerships, as set out in *UUW55 - Retail Business Plan.*

Case study: Maximising the potential of an open banking economy

We are leading efforts to ensure that when eligible customers reach out to us they can access support as soon as possible, minimising administrative or bureaucratic hurdles. During AMP7, in addition to launching a single online application form for all support schemes (replacing individual scheme application forms and consolidating all of our affordability information into a single support booklet), we were the first water company to implement an open banking solution, offering customers the option to provide their financial information in a quick and easy way that allows us to verify customer income (including evidence of benefit payments) in real-time to improve the accuracy and efficiency of our customer affordability assessments.

Prior to this solution, customers applying for affordability support had to manually collate their income and expenditure information, including evidence of benefit receipt, in preparation for their telephone affordability assessment. Completing a typical assessment takes on average 20 minutes, requires physical forms of verification, and over a week of administration. By contrast, completing an assessment using open banking reduces the amount of time taken, with considerably reduced effort for customers, increased accuracy, and the ability to verify a customer's income real-time so they are given a decision on tariff eligibility there and then and a sustainable payment plan can be agreed.

Open data now forms a key part of one of our most sensitive customer journeys. Initial results show that 40 per cent of customers offered the option to use open banking agreed, and customer feedback on their experience of open banking has been very positive, with all customers saying it was easy to use and 83 per cent saying they would use it again. We plan to take this further in AMP8, building open banking assessments into our fully digital and automated affordability assessment journey, meaning it will be seamless rather than a stand-alone process.

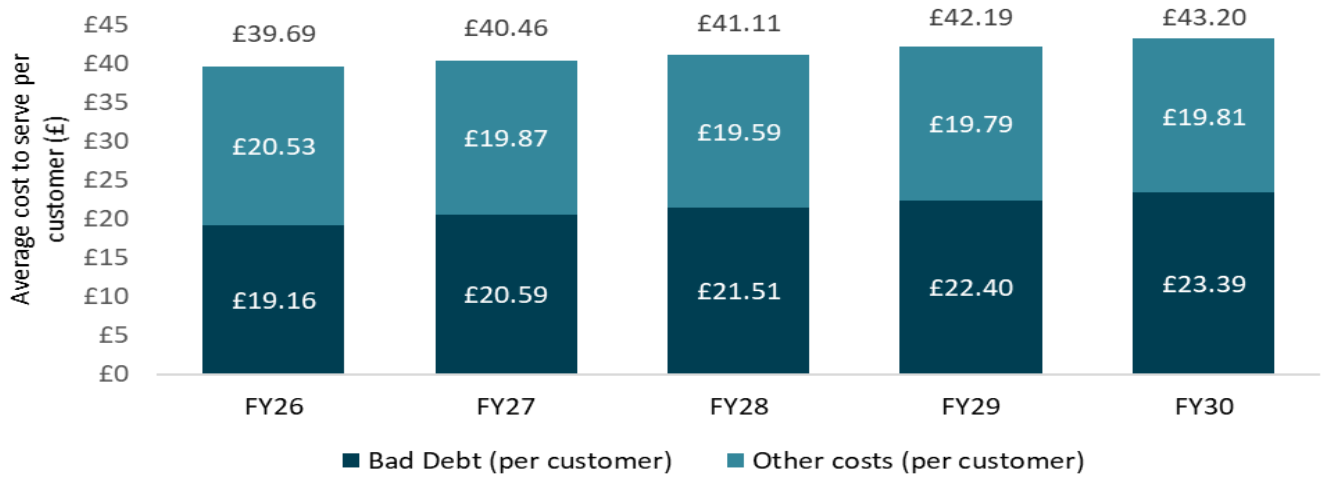
Our continual market testing approach ensures we align to frontier, leading edge approaches on an ongoing basis. We are also aiming to reduce bad debts with the help of increasing smart capability, promotion of water efficiency, and further enhancing affordability schemes.

The scale of deprivation in our region means customers in the North West have been more significantly impacted by cost-of-living pressures, and it is more important than ever before that we are doing everything we can to get support to customers that are struggling to pay their bills. We provide leading levels of affordability support to those in need. Our capabilities in open data and data sharing are truly innovative, meaning we can offer a frontier stretching affordability support offering. We do not want customers in the North West to worry about their water bill, which is why our plan for AMP8 sees us nearly doubling the level of financial support and provides our most extensive support package offered to customers. More information on our affordability support can be found in Chapter 4.

8.6.4 AMP8 proposed retail costs

Retail costs for AMP8 are proposed to increase from £545 million in AMP7 to £677 million as explained above. This represents an average annual cost to serve of £41 per customer, as shown in Figure 8-10. The chart illustrates that the increase is driven primarily by anticipated higher bad debt charges (shown in the darker green).

Figure 8-10: Average household retail cost to serve proposed for AMP8



Source: UUW PR24 business plan

8.7 Assessment of base totex

8.7.1 Base costs

We have developed a robust and balanced suite of cost models. This was combined with other assumptions on efficiency and triangulation to derive an efficient forecast level of base costs for AMP8. The details of this modelling approach are set out in supplementary document *UUW46: Cost assessment proposal.*

We used these models to test the efficiency of our base cost proposal (with a reconciliation of our base costs to the modelled cost definition provided in Table 8-5). The models indicate that a reasonable expectation of an efficient and stretching base modelled cost for our wholesale price controls would be £5,207 million, and for household retail would be £742 million in nominal terms, which equates to £641 million in FY23 price base. This highlights the level of stretch and ambition in our plan.

Table 8-5 Reconciliation of our proposed base costs to the modelled cost definition

£m (FY23 prices)	Wholesale	Retail
Base costs (as per Table 8-2)	5,332	585
Adjustments to align to modelled cost definition:		
Remove: Unmodelled costs	(758)	
Remove: Non price control costs	(7)	
Add: S185 diversions (Water)	20	
Add: Network Reinforcement	175	
Add: Reduced flooding risk to properties	139	
Base costs (aligned to modelled cost definition)	**4,901**	**585**

Catch-up efficiency challenge and frontier shift

Analysis of outturn industry performance so far in AMP7 suggests that there is no evidence that additional stretch is needed within the regulatory contract. We consider that efficiency challenges should be set in a coherent way, with reference to stretch induced in other parts of the regulatory contract, for example through performance

improvements being made from base costs. As such, we consider the upper quartile level to be an appropriate catch-up challenge. We also consider the mid-point of the 'PR24-focused range' identified by Economic Insight to be an appropriate assumption for ongoing frontier shift, although we add a small element of additional stretch to this to ensure our plan is highly ambitious.

Real price effects

Real Price Effects (RPEs) occur where the price of an input rises at a different rate to general inflation.

There have been significant cost shocks in recent years, which will be reflected in part of the historical dataset used to set botex allowances, but most of the years in the historical dataset are 'low cost' relative to the current period, and these mediate the impact of the inclusion of recent 'high cost' years, meaning AMP8 allowances will likely not reflect the cost pressures companies can expect to face in AMP8.

Energy is a prominent example of this. As set out in section 8.5.1, we take a prudent approach to risk management and our energy hedging policy has provided considerable protection for the company and for customers from the particularly volatile market conditions during AMP7. While wholesale energy prices may fall during AMP8, companies would only benefit from this in the medium term if they do not secure hedged positions on electricity prices, leaving exposure to substantial energy price risk. As can be seen in Figure 17 within supplementary document *UUW46 - Cost assessment proposal*, our forecast power costs in AMP8 continue to be substantially higher than cost targets set by reference to historical costs will likely allow. However, energy prices are forecast to fall slightly over the course of AMP8. As such, we consider that on balance, companies may face a neutral cost position, as the lack of recognition given to high costs by the costs models may be offset by the expected fall in energy prices. For this reason, we are not seeking an RPE adjustment relating to energy costs.

We note that other companies are seeking an upward adjustment relating to expected higher power costs in AMP8. If an adjustment is granted this should be industry-wide and not company-specific to avoid incentivising inefficiency in future submissions.

Unmodelled costs

There are some base costs that are not suitable for inclusion in models, and we believe these should continue to be assessed separately from the modelled benchmark. Our base totex includes £758 million of unmodelled costs, as set out in Table 8-6. More detail can be found in section 3 of supplementary document *UUW46 - Cost assessment proposal.*

Table 8-6 Unmodelled costs

Unmodelled costs (FY23 price base)	£m
Business rates	560
Abstraction and discharge services licenses (water service only)	118
Non-s185 diversions (recoverable from customer bills)	34
Equity issuance costs	23
Costs associated with the Traffic Management Act 2004	11
Third party costs (price control) – excludes non-s185 diversions	9
Industrial Emissions Directive compliance costs	3
Statutory water softening costs	-
Total unmodelled costs	**758**

Developer services

There is high demand for new properties in the North West, and a successful and well-established competitive market for developer services in the region, with competition for new connections work higher than the industry average. Charging arrangements are set prospectively based on forecasts. We have taken steps through AMP7 to improve the way we set charges and we actively engage with developers, land agents and the planning process to improve the accuracy of our forecasts to ensure charges are cost reflective, competitive and deliver best value. More information can be found in supplementary document *UUW54: Developer services business plan*.

8.7.2 Cost adjustment claims

After careful consideration, we have proposed three well evidenced cost adjustment claims, as set out in Table 8-7, totalling £444 million. All three represent areas where scope has increased since PR19 leading to future incremental cost pressures that cannot be explained by reference to historical costs in the models.

Table 8-7: Cost adjustment claims

Cost adjustment claim	£m
Reservoir maintenance costs: Costs to comply with legislative safety requirements are materially higher than historic benchmarks as a result of the increasing number and cost of regulatory maintenance actions since the national regulatory response to the Toddbrook Reservoir emergency (the 2020 Balmforth Report), and increasing scope following the EA's updated flood risk maps in 2022. The impact of these cost increases is disproportionately high in the North West as a result of our larger than average fleet of reservoirs.	186
Industrial Emissions Directive (IED) permit compliance at anaerobic digestion sites: Updated guidance for the biological treatment of waste, published in 2022, imposed new and more onerous standards of environmental protection that must be delivered at our anaerobic digestion sites. This reflects a step change in requirements for waste treatment, and will incur material additional costs compared with historic benchmarks. This claim reflects AMP8 costs only, although by the end of AMP7 we anticipate that we will have already absorbed a further £66 million.	173
Ongoing operating expenditure for phosphorus removal: Meeting tighter phosphorus removal permit levels required by our AMP7 WINEP requires substantial volumes of chemicals and/or the installation of new, additional treatment processes. This will drive additional operating costs, materially higher than the historic cost benchmark. We are seeking innovative interventions where possible, but these do not fully mitigate the additional costs.	85
Total	**444**

We include a further conditional cost adjustment claim of £153 million for the combined effect of urban rainfall and combined sewers, which cause materially higher drainage management costs in the North West. We consider that the challenges caused by these exogenous regional factors is most efficiently reflected through the use of company-specific targets for internal sewer flooding (as set out in Chapter 5). We have therefore excluded these factors from our base totex model suite, but include this conditional cost adjustment claim in case our approach to company-specific performance commitment levels is not accepted. The value of this claim is net of the implicit allowance of Ofwat's proposed model suite, which has partial adoption of an urban rainfall factor.

Full details on these cost adjustment claims can be found in supplementary document *UUW44: Cost adjustment claims*, including the mechanisms by which we propose that customers will be protected. There are no material changes to the claims set out above since our early submission. We had initially included one further cost adjustment for waste permit compliance at physico-chemical sludge sites (UUW_CAC_005), but we have withdrawn this claim as set out in *UUW44*.

The estimates in our cost adjustment claims have received external assurance from PwC, who reviewed the robustness of our approach to develop cost estimates and accuracy of input data, with a particular focus on the PR24 cost efficiency criteria. PwC found our approach to be robust, with a detailed and logical methodology.

8.8 Our AMP8 enhancement programme

Our £7.3 billion enhancement programme represents the largest ever multi-AMP environmental improvement programme, delivering substantial benefits for the North West. As Table 8-6 shows, our AMP8 WINEP accounts for 78 per cent of the programme.

Table 8-8 shows the amounts we are seeking to recover for each enhancement. There is a further £95 million of contributions from partnerships. Section 8.9.5 sets out the projects that we propose to be delivered by direct procurement for customers (DPC).

Table 8-8: Enhancement expenditure

Enhancement expenditure	Pre-efficiency £m	Post-efficiency £m	PCD?[7]	Supplementary document ref	Summary in Chapter
Overflows reduction plan and Advanced WINEP	3,157	3,089	P	UUW64	8.8.1
Total WINEP obligations – storm overflows	**3,157**	**3,089**			
Final effluent	966	945	P	UUW63	8.8.2
Davyhulme	805	784	Y	UUW43	
Wigan and Skelmersdale	353	344	Y	UUW43	
Investigations	67	66	N	UUW63	8.8.2
Flow monitoring and Event Duration Monitors	168	164	P	UUW64	8.8.2
Sewage sludge drivers	173	170	Y	UUW66	8.8.3
DPC Management	28	27	Y	UUW67	
Water resources	108	105	P	UUW60	8.8.2
Total WINEP obligations – other	**2,668**	**2,606**			
Vyrnwy re-lining in AMP8	154	151	Y	UUW60	8.8.4
Lead replacement	92	90	Y	UUW60	
SEMD and NIS-D	62	61	N	UUW60	
Raw water quality deterioration	43	42	Y	UUW60	
Total non-WINEP obligations from DWI	**351**	**344**			
Smart metering	246	241	P	UUW61	8.8.5
Leakage	148	144	Y	UUW61	8.8.6
Water trading	79	77	N	UUW62	
Water efficiency	21	20	N	UUW61	
Total Interventions to deliver our WRMP	**494**	**482**			
Rainwater management	136	132	Y	UUW65	8.8.7
Wastewater supply and demand	140	137	Y	UUW65	
Coastal and river erosion	29	29	N	UUW65	
Total Interventions to deliver our DWMP	**306**	**298**			
Carbon Net zero	200	196	P	UUW67	8.8.8
Sewer flooding	142	139	N	UUW65	
Power resilience	21	20	N	UUW67	
HARP DPC management costs	25	25	N	UUW62	
Wastewater reservoirs Phase 1	20	19	N	UUW65	
Green recovery	24	24	N	UUW65	
Improving resilience in biosolids recycling to agriculture	55	54	Y	UUW66	8.8.3
Bioresources preparatory work for alternative outlets	11	10	N	UUW66	8.8.3
First time sewerage	5	5	N	UUW65	
Total Other key priorities	**503**	**493**			
Total Enhancement expenditure	**7,478**	**7,311**			

[7] Y = covered by one or more PCDs, N = not covered by a PCD, P = partially covered by one or more PCDs

This section provides summarised detail on some of the most significant projects. Full details can be found in the supplementary documents referenced. Section 8.9 details how we have challenged and reduced the cost of our enhancement programme, and section 8.10 sets out how we propose that cost efficiency is assessed.

8.8.1 Overflows reduction plan and Advanced WINEP

Background

We have made significant investment since privatisation, installing new wastewater treatment works, tunnels and tanks in coastal urban areas including Liverpool, which has helped us to tackle a number of unsatisfactory overflows that we inherited at privatisation. We have also delivered significant improvements to rivers across the North West, and this has been targeted carefully using our extensive water quality modelling capability to identify where overflows need improvement to meet water quality standards.

The legal and regulatory framework has meant that previous investment in storm overflows in England has been directed towards areas where potential harm is greatest, for example areas with lower rainfall (meaning less dilution in the rivers). As a result, the spill frequency differs significantly between overflows across England. This has resulted in a higher spill frequency in the North West than other regions as a result of higher than average rainfall, and particularly urban rainfall, as well as the nature of our receiving waters with many being fast flowing and therefore well-oxygenated. There has also been significant population growth since sewer networks were built, but investment for population growth has been targeted at offsetting the impact of growth and allowing us to maintain service levels, rather than increasing capacity in the network to reduce spills over and above that necessary to meet water quality standards. We recognise that the time has come to change, but this is a significant change in regulation and achieving it will take time and sustained, new investment.

Actions taken to date

We have made a fast start through our 'Better Rivers: Better North West' programme, supported by additional reinvestment of outperformance, and have made good progress so far with a 39 per cent reduction in reported spills in 2022/23 compared to the 2020 baseline.

It will get progressively tougher as we focus on more challenging overflows. Key to delivery is our improvement in monitoring and operation of storm overflows. We have increased our monitoring to 97 per cent of overflows and will achieve full coverage before the end of 2023.

The Accelerated Programme investment means we are bringing forward additional spend to tackle overflows as soon as possible, with this accounting for £191 million of the £197 million investment accelerated into AMP7.

AMP8 plan

Our plans for AMP8 target a further 33 per cent reduction against the Ofwat measure of spills, with more than 29,000 fewer spills per annum from 437 overflows. This will see us improving 28 per cent of overflows, including 41 per cent of high priority overflows. We are targeting a mix of traditional and natural solutions, and have ambitious plans to maximise blue/green solutions for rainwater management through our Advanced WINEP programme.

As a result of the spill frequency in the North West, we have further to go than any other company to get to the new targeted number of spills. We aim to reach the Ofwat proposed target of 20 spills per annum by 2030, which is a highly stretching target considering the significantly higher starting point we are facing in the North West. We propose company-specific performance commitment levels (PCLs), as set out in Chapter 5, to reflect the unique challenge we face in delivering the 20 spill target.

The starting point of our plan is the spill frequency determined through hydraulic modelling of expected performance (rather than actual performance) from assets under the pre-Environment Act legal framework, ensuring customers will not pay for anything that has been funded previously. Customers will be protected through a price control deliverable (PCD) as well as outcome delivery incentives against PCLs.

Details can be found in the supplementary document *UUW64*.

8.8.2 Water and wastewater WINEP (excluding overflows)

The scale of the environmental improvement plan we must achieve in AMP8 is unprecedented. Even excluding the £3.1 billion overflow programme, this represents the largest WINEP we have delivered, largely driven by requirements to reduce sanitary determinant and phosphorus levels in wastewater, as well as flow and event duration monitoring requirements. To give an idea of the scale of investment needed, in AMP7 we invested £530 million to remove phosphorus for a population equivalent of 3.3 million, where we were able to achieve significant economies of scale due to work relating to larger treatment works, with only 17 per cent of the treatment works in the programme serving small populations. In AMP8, over half of the treatment works in our phosphorus removal programme serve populations of less than 1,000 people, meaning less opportunity to exploit economies of scale and consequently a higher cost.

Details can be found in supplementary documents *UUW60*, *UUW63*, *UUW64* and *UUW67*.

8.8.3 Bioresources enhancements

We have three enhancement cases for bioresources: WINEP sewage sludge drivers; preparatory work for alternative outlets; and resilience in biosolids recycling to agriculture. The latter was included in our original WINEP submission but did not meet the criteria for WINEP and was therefore rejected from inclusion. However, there is a clear investment need given the heightened uncertainty in bioresources with regulatory change and anticipated reductions in available landbank for sludge recycling to agriculture.

The bioresources sector is undergoing significant and unpredictable change, including evolving (and tightening) regulation to meet Waste Framework Directive requirements (which also encapsulates IED regulations) and multiple regulatory and market drivers that constrain the use of the agricultural outlet for biosolids recycling – either by reducing the landbank available, or placing restrictions on the use of land (such as requiring reduced rates of spreading) such that more land would be required. This could drive significant change (and likely a deficit) in the supply/demand balance in the agricultural landbank required for sludge recycling. These changes have the potential to drive very significant new investment requirements. In contrast, changes in the past have been relatively small, when compared with the potential scale of investment required in future price control periods.

We have set out a business plan that (a) includes high certainty requirements that provide a clear scope and cost with low regrets investments (including our enhancement cases to improve biosolids quality and supply chain resilience to help maintain this outlet), and (b) includes the necessity of an uncertainty mechanism (a Notified Item) as a means of managing the uncertainty in future investment requirements. We believe this is the right approach to best protect the interest of customers – better than seeking to recover significant additional amounts up front from customers and then refund them in the event that those investments are not required.

Details of the enhancement cases can be found in the supplementary document *UUW66.* Details of the proposed uncertainty mechanism can be found in *UUW58* and section 9.3.3 of Chapter 9.

8.8.4 Vyrnwy re-lining

We have a historical regulatory requirement for the cleaning and/or lining of the Vyrnwy large diameter trunk main (LDTM) to reduce the number of iron infringements and discolouration contacts in the water supply zones served by this main, and need to address the requirements from a DWI enforcement order[8] to do this by 31 December 2028. AMP8 investment will enable completion of the existing commitment. Initial work was paused to pursue a potential innovative solution as agreed with DWI and Ofwat for delivery at Oswestry water treatment works, but the DWI has required us to revert to the original solution of cleaning/lining the remaining sections. Cost estimates submitted at PR19 for this solution were high level as we did not expect to use it due to the preferred alternative at the time. With more detailed information, including pipe density needs at different locations and condition assessments guiding us on areas that require re-lining rather than cleaning, as well as market conditions since PR19, we have revised our cost estimates to improve accuracy. Details can be found in the supplementary document *UUW60*, and section 5 of supplementary document *UUW49: Innovation framework and strategy* sets out how innovation has improved efficiency.

[8] Reference number: UUT-2020-00002

8.8.5 Smart metering

There is an increase in water demand due to population growth and climate change. Metering will help with reducing per capita consumption (PCC), by influencing customers' water consumption behaviour, and with identification of leaks, helping us to reduce leakage. With the lowest metering penetration in the industry, we need to start rolling out smart meters from year one of AMP8 in order to meet the 2050 national targets for PCC and leakage reduction. Our plan sees us rolling out around 500,000 new smart meters to existing customers in AMP8, over and above our baseline metering activities, and replacing over 420,000 older meters with advanced metering infrastructure (AMI) meters. Our overall unit costs are comparatively high, but this is impacted by low levels of meter penetration. Details can be found in the supplementary document *UUW61*.

8.8.6 Leakage

We are proposing a further large leakage reduction in AMP8, in line with our ambition to halve leakage levels by 2050. As this is a significant improvement in service rather than maintaining stable historic performance, there is a need for enhancement expenditure. Details can be found in the supplementary document *UUW61*.

8.8.7 Rainwater management

Our rainwater management enhancement programme allows us to make long-term interventions to mitigate the long-term impacts of climate change, rather than targeting short-term sewer flooding reductions. Managing the input of rainwater through attenuation and disconnection is the most sustainable approach to starting our long-term adaptive plans, and will reduce the likelihood of carbon-intensive conventional solutions for future generations. There is minimal overlap intersecting the upstream contributing areas of the DWMP flood clusters with hybrid solutions under the Advanced WINEP. Details are in the supplementary document *UUW65*.

8.8.8 Carbon net zero

To achieve a transformational change we will require substantial investment, beyond historic base, with greenhouse gas emissions reduction as a primary driver, both for immediate reduction opportunities where they exist and for enabling activities to support longer-term reductions. We are aiming to deliver a benefit of 225,338 tCO2e aligned to our 2030 strategic actions, as outlined in our supplementary document *UUW37 'Net Zero 2050 plan*'. Some of these schemes included in this programme are regular enhancement expenditure and some are application for the net zero challenge fund. Without investment from enhancement expenditure, we are at risk of not meeting net zero obligations. Details can be found in the supplementary document *UUW67*.

8.8.9 Our approach to ensuring customers are protected

We recognise that price control deliverables (PCDs) are a legitimate mechanism for protecting customers against the benefit that companies may gain from either late delivery or non-delivery of funded investment that is reflected at the price control. This is needed because:

- There may not be an associated PCL (and ODI) to protect customers; or,
- The value of any impact on an associated PCL/ODI penalty may be much smaller than the benefit to the company of avoiding costs through late/non-delivery.

Important considerations in designing effective PCDs

When designing PCDs it is important to ensure that they provide appropriate incentives for companies to act efficiently, and to ensure that the PCD payments do not over-compensate customers – this is particularly important given Ofwat's policy position that PCDs be asymmetric, and penalty only. It is important to consider:

- There may be many methods by which a customer or environmental benefit might be achieved – it is therefore important that PCDs do not restrict flexibility in how the benefit is to be achieved as long as that benefit is sustainable and compatible with meeting our legal obligations;
- PCDs should avoid the risk of removing/reducing incentives for innovation and efficiency. For example, if it is possible to achieve an expected benefit (such as a tighter compliance target) without the significant construction that had been anticipated, the benefit of any lower costs will be shared with customers through

existing cost sharing mechanisms. A PCD should not simply test whether or not a particular capital intervention has (or has not) been delivered;

- PCDs should reflect delivery of interventions that lead to expected benefits. They should not track company performance or the impact of externalities (such as the weather) on performance, as that is the role of PCLs;
- Requirements and timing of the delivery of those requirements can, and do change, for many legitimate reasons, which may enable a lower overall cost of delivery to the benefit of customers. We therefore do not support PCDs passing full costs (or a significant part of costs) back to customers or any other significant penalties for late delivery, and propose that customers should only be compensated for the time value of money and a moderate approach to compensation for late delivery of benefits;
- In all cases, we consider that companies should be tested at the end of AMP8 against "ultimate delivery" against AMP8 expectations, to test how much (if any) of the allowed totex cost should be passed back to customers. As long as the company has (or will) delivered against its funded requirements, then the key role of PCDs should only be to compensate customers for late delivery (which should largely relate to the time value of money of delayed investment and any avoided opex). Similarly, for PCDs in areas where companies are delivering a large number of lower cost items (such as metering or lead replacement), ultimate delivery should not be tested on an annual basis, but at the end of the AMP, to ensure companies can manage natural annual variations caused by customer demand and other externalities;
- PCDs could be high in value (especially for large capital programmes), so it is imperative that PCD payments are primarily applied as RCV adjustments at the following price control, and not as revenue adjustments; and,
- For Bioresources, where Ofwat is proposing to move away from reliance on the traditional RCV building block approach at future price controls, it is important that PCDs should not compensate customers for non-delivery by more than Ofwat is committing that companies would have been able to recover from customers in future price controls. Given Ofwat's long-term strategy for Bioresources price controls, we do not believe it would be appropriate for PCDs to protect customers by more than the value (on average) that would be recovered from customers in AMP8 alone (and therefore not the full assumed cost of the related investment). For this reason, we have restricted Bioresources PCDs to pass no more than 25 per cent of AMP8 totex back to customers.

Asymmetric risk from PCDs

We also note that PCDs place an asymmetric risk onto companies. Ofwat has insisted that PCDs should be applied asymmetrically, as a "penalty only" clawback mechanism, to compensate customers for non-delivery. However, Ofwat's proposed design leads to companies being negatively impacted in all circumstances: if companies invest early to deliver early, in order to avoid the risk of PCD penalties, then they will incur additional (unfunded) financing and operating costs as a result of that early delivery; or if companies deliver late, then PCDs would likely compensate customers by more than the benefit to the company of any delay in expenditure.

Therefore, the only way that companies could avoid PCD related losses (and hence recover allowed returns) would be to deliver perfectly to the timetable assumed in the price control, for each individual enhancement (as it is not possible to trade off early delivery in one area against late delivery in another, given the asymmetric approach that Ofwat is expecting). This seems highly infeasible, and hence would result in an inherent downward skew in the ability of companies to recover allowed returns.

Ofwat should reconsider this aspect of its PCD methodology, to allow (even if only limited) some greater symmetry in each PCD mechanism, and/or the ability for a company to be able to trade early delivery off against late delivery, both within and between PCDs. Customers would still be protected even if the totality of value arising from PCDs is capped at zero.

Our approach to setting PCDs

We are proposing strong customer protection measures across our enhancement programmes. We have developed PCDs for relevant enhancement programmes against a common framework, taking account of Ofwat's developing process, as set out in its PR24 methodology and follow up workshop. In setting PCDs, we have:

- Applied PCDs to those enhancement areas that are greater than 1 per cent of the relevant service totex, per Ofwat's guidance;

- Utilised metrics for each PCD that (a) relate to the delivery of anticipated benefits, (b) enable, where possible, for companies to be flexible in how those benefits are delivered (to support *ex post* innovation and efficiency), and (c) relate only to the delivery of expected benefits and not to performance (especially where performance may vary due to external factors such as the weather);
- Adjusted PCD payment rates for cost sharing and for any anticipated impact on PCLs (and hence ODIs), to negate any risk of double counting, and hence to ensure that customers are compensated appropriately for each enhancement area; and,
- For each applicable enhancement area, we have created PCD payments in three parts:
  - A payment for ultimate delivery of requirements – each PCD has an end-of-period test for whether the investment or benefits funded by customers has been (or is expected to be) delivered;
  - A time value of money adjustment for each year of late delivery, that compensates customers for annual opex and the time value of capex; and,
  - A delayed value payment, reflecting the value of interventions that have been delayed or not delivered, including avoided opex.

We also note, in the case of Bioresources, it is essential that PCDs do not result in total investment value being returned to customers, given the lack of RCV support, and that Ofwat is planning to base future Bioresources revenue controls on benchmarked revenues. Bioresources PCDs should therefore only reflect the proportion of costs being recovered from customers in AMP8, and cannot presume that remaining costs will be recovered from customers in future AMPs as there is no guarantee that this will be the case.

We have set PCDs for AMP8 only. We observe in some cases (especially the WINEP) there is the possibility of some scheme delivery spanning more than one AMP period. We propose that some PCDs may need to be amended to be multi AMP, or for PCD payments for non-delivery to be used to transfer cost allowances between AMPs, to support ultimate delivery in a late AMP (similar to Ofwat previous approach to “shortfalling”).

Our modelling of PCDs

We have produced a simple spreadsheet model (*UUW32*) that represents how the PCD payments have been assessed, and demonstrates how payments would be assessed under different delivery scenarios. We have not used Ofwat's example spreadsheet, as we were unable to utilise it whilst maintaining integrity with the key principles. Issues with the example spreadsheet include;

- Simplifying assumptions that enhancement spend will only impact one PCL. It is likely that some enhancements will impact multiple PCs and therefore ODIs which have different rates and units;
- Inability to account for different cost sharing rates across multiple price controls (and therefore address the issue of the interaction with cost sharing and cost allowances in Bioresources);
- Consideration of outturn totex - any PCD model should be silent on outturn totex. If there is over- or under-spend against totex allowances (whether base or enhancement) then this will be accounted for first through the totex reconciliation mechanisms. PCDs should track delivery of units not the efficiency of delivery;
- Capacity for financial upside for over-delivery of PCD units – if more units are delivered within the totex allowance, the model assumes a negative payment to (i.e. from) customers;
- Significant late delivery of PCD units beyond AMP8, but with no totex or PCL impact, does not result in a PCD payment to customers. We would assume that delivery beyond a reasonable timeframe (e.g. mid-AMP9) would result in a payment to customers; and,
- Inclusion of a PCD percentage threshold test. We consider this is more simply performed outside of any PCD model, such as through using Ofwat’s enhancement line grouping versions of business plan tables CW3 and CWW3 as set out in its price control deliverables guidance issued in July 2023 (IN 23/05 Appendix 3).

We believe the approach we have proposed provides a robust means of delivering the key aims of PCDs. The mechanisms we are proposing to protect customers for each enhancement case are detailed in the relevant supplementary documents, as referenced in Table 8-8.

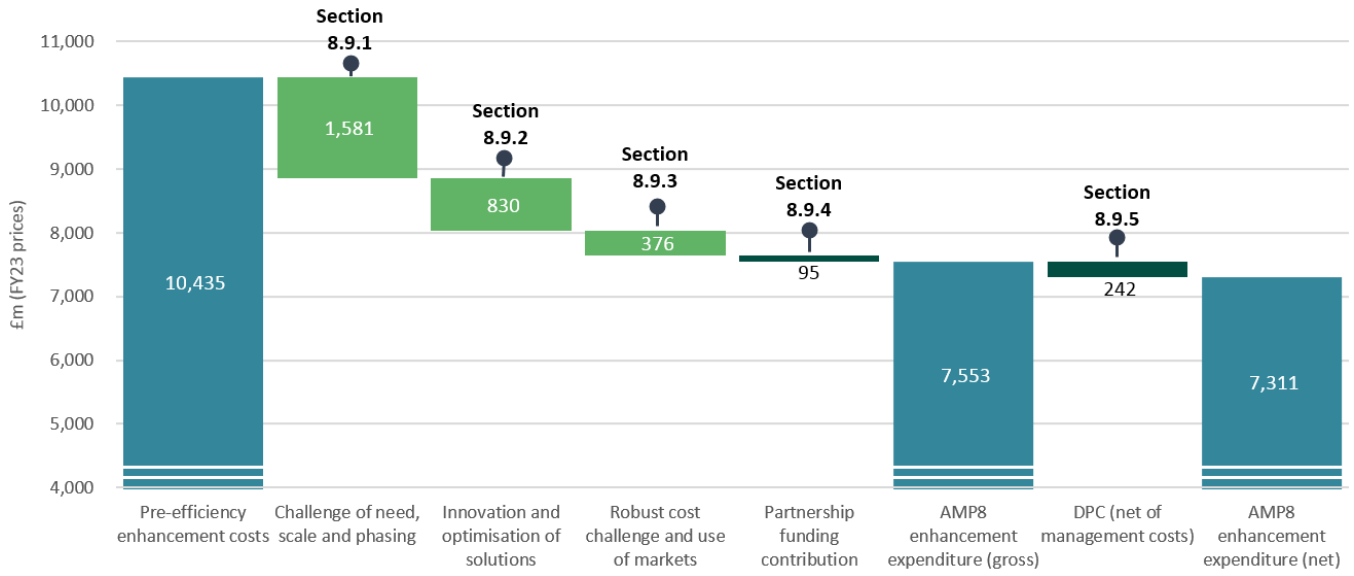
8.9 Developing the best value for money enhancement solutions

With such a large programme, it is key that our proposal is efficient and delivers the best value for money.

Starting from a bottom-up build with high level engineering estimates, the process outlined in section 8.4 has driven around £2.8 billion of reductions across our enhancement spend. This is shown in Table 8-3, is illustrated in Figure 8-11 and described in sections 8.9.1 to 8.9.4. This reduction was delivered through challenging the need and optimal scale and phasing of activity, establishing the optimal solutions with use of innovation, blue/green and hybrid solutions where practical, robustly challenging costs and making effective use of markets.

In addition, our plan includes £95 million to be secured through partnership funding, and we have identified a bundle with total scheme value of £269 million (£242 million net of DPC management costs) that we believe is suitable for DPC in AMP8, together with a further £344 million project (£315 million net of DPC management costs) that we believe will be eligible for DPC, both subject to agreement with the EA to amend the regulatory dates associated with the schemes.

Figure 8-11 Progressive cost refinement, partnership funding, and DPC projects in our enhancement totex



8.9.1 Challenge of need, scale and phasing

A large proportion of our enhancement expenditure is driven by strict legislative requirements with ambitious timetables for implementation. Nevertheless, we have robustly challenged the programme to identify options to constrain and optimise it, as well as engaging in constructive dialogue with regulators on delivery dates to optimise timing and phase investment where possible to deliver the best value for all of our stakeholders and protect long-term customer affordability. We also appointed an independent scrutiny panel to challenge the scope of our WINEP submission and how we are meeting requirements.

Through robustly challenging the need, scale and phasing of investment, we have removed around £1.6 billion from the original build of our AMP8 enhancement plan.

Long-term adaptive planning

The future holds unprecedented change with climate change, population growth, advances in technology, and evolving national and regional needs including the levelling up agenda and its aim to promote a growing North West economy. This creates challenges and opportunities. In order to respond to these changes, we have embraced adaptive planning in our long-term delivery strategy (LTDS) – read more in supplementary document *UUW12 – Long-term delivery strategy*.

Long-term planning has always been critical for maintaining our essential services for customers, and we have a strong track record with our WRMP, DWMP, long-term drinking water plan, and regional integrated asset plan (RIAP) for bioresources. Our LTDS is the next evolution, and has helped us to build our AMP8 plan in the context of a wider 25-year strategy. It considers and tests a range of alternative scenarios to reflect future uncertainty,

helping to ensure our actions in the short and medium term are low or no regrets under a range of plausible future scenarios, giving us the best foundation to deliver our long-term ambitions at the best value for money.

By building our plan for the next five years in the context of the longer term, we have been able to better understand the top priorities that require investment now, identify areas where preparatory work is essential to mitigate future risks, and find opportunities to phase investment until the requirement is more certain to minimise uncertainty and obsolescence risk and to maximise value for money.

For example, we have identified an estimated £1 billion cost to develop alternative outlets for biosolids, which is required in the event of a loss of landbank for biosolids recycling. However, until we have more certainty on landbank availability we have proposed a much smaller £10 million low regrets preparatory enhancement case to undertake work to develop a detailed plan to enable us to implement a managed transition away from landbank to alternative outlets. Our AMP8 no/low regrets enhancement cases, and our approach to dealing with the uncertainty on future landbank availability, is set out in section 8.8.3.

Where possible we are making use of phasing and adaptive planning to ensure we meet statutory requirements in a way that balances costs across the AMPs and prioritises delivery of least, low, or no-regret measures first. We developed our AMP8 WINEP proposal within the long-term context to ensure that our plan is balancing investment across the AMPs and intervening at the most appropriate time. We have proposed phasing of schemes in the AMP8 WINEP, particularly where the outcomes of upstream investment may alter the solution needed downstream, or investigations are required to reduce uncertainty around decisions.

Case study: Further phasing opportunity at Davyhulme

Our adaptive plan for Davyhulme, our largest wastewater treatment works, includes the construction of a phosphorus recovery plant for the sludge liquor stream in AMP8. This first step of our plan would embark upon satisfying the requirement to prevent deterioration in phosphorus concentrations in the Manchester Ship Canal, reducing the phosphorus loading on the treatment works by recovering it from the sludge liquor stream, without the need for any chemical removal of phosphorus. This phosphorus recovery plant will be central to the chemical-free phosphorus removal strategy for the site, with future (new and converted existing) streams being added for biologically removed phosphorus.

Upgrade to the works would reduce biochemical oxygen demand (BOD) from 20mg/l to 8mg/l. This is an alternative pathway to the Water Framework Directive requirement of 6mg/l BOD, as to meet the latter in the time available and without phosphorus recovery capability would require a chemical phosphorus removal solution. Our further phasing opportunity proposes that we deliver 8mg/l BOD within AMP8 on the basis that 6mg/l is included within our AMP9 plan. Our adaptive plan targets a 0.25mg/l technically achievable limit removal of phosphorus by 2038 for Davyhulme through a process conversion to Enhanced Biological Phosphorus Removal, which will achieve the AMP9 target of 6mg/l. Pursuing this adaptive strategy enables us to deliver a significant proportion of the environmental benefit for an efficient cost, whilst enabling longer term efficiencies.

We are currently actively discussing our proposal with the EA, who recognises the complexity of the issue and our commitment to reach the long term targets in the most efficient way possible. We have therefore only included the costs for the adaptive scheme, achieving 8mg/l BOD in our AMP8 plan. Postponing the implementation of the 6mg/l BOD until AMP9 not only significantly reduces the investment required in AMP8, it also allows a joined up approach with other required investment in AMP9, delivering the most cost efficient approach for the enhancement of our largest treatment works.

Where there is uncertainty, we are proposing preparatory work or investigations ahead of action so that subsequent investment can be optimised to achieve the best value for money. We have prioritised a number of investigations and monitoring work in AMP8, including 11 drainage area catchment investigations to help plan our investment in overflow reduction, which will enable us to more fully understand issues and reduce uncertainty around investment decisions to ensure we can confidently deliver the most appropriate and best value solutions.

Phasing can also help to improve the wider value that can be achieved, such as maximising the delivery of blue/green and hybrid solutions through our Advanced WINEP.

Case study: Advanced WINEP

Our plan to reduce the usage of storm overflows is prioritising the right combinations of investment in grey, blue/green and hybrid solutions at high priority sites and investment in rainwater management, through the Advanced WINEP, in the short term.

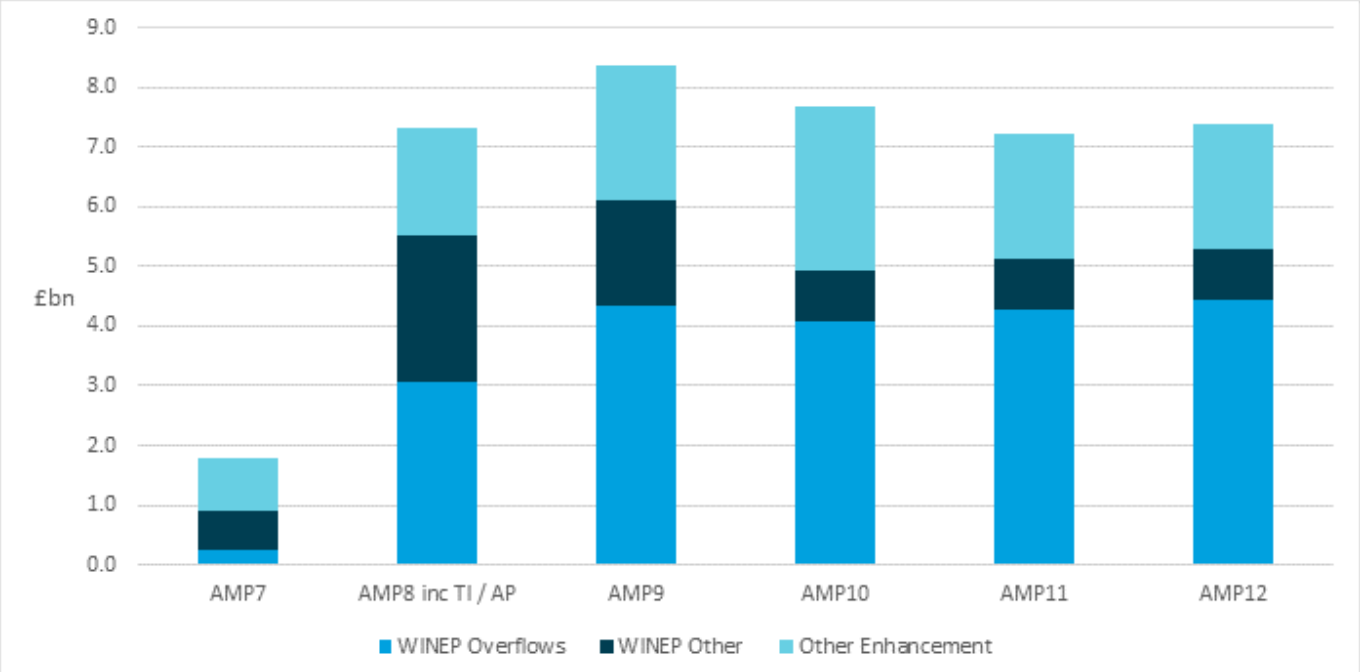
Our Advanced WINEP programme has been developed in partnership with regulators to evolve the regulatory model and remove barriers to delivering nature-based solutions, creating more flexibility and allowing us to attract and maximise co-funding. It will deliver rainwater management interventions so as to reduce the scale of future investment to reduce storm overflow spill frequency through adaptive and phased investment.

This prioritised investment will deliver resilience to climate change and drive better value solutions to reduce storm overflow spill frequency over the longer term.

When looking to phase investment it is helpful to understand the level of expenditure likely to be required in future periods. We have estimated our planned expenditure for future periods out to 2050 (the end of AMP12) to deliver our ambitions across each wholesale price control. There is a core pathway, shown in Figure 8-12, which we would expect to follow under most future scenarios, as well as a number of alternative pathways we may need to follow under different future scenarios (such as adverse climate change).

For the purposes of comparison, we have made a broad assumption that a similar level of efficiencies will be delivered in future periods as that identified for AMP8, though looking so far ahead we do not yet know if this will be possible or how it will be achieved. This shows that overall totex needs are expected to remain significantly higher than AMP7 out to at least 2050.

Figure 8-12 - Long-term cost expectations for AMP9 and beyond following our core pathway



Source: UUW12 - Long-term delivery strategy

Independent scrutiny panel challenge of our WINEP

Our substantial WINEP is a significant driver of customer bills and therefore an important area of focus in ensuring we achieve maximum value for money. It is imperative that we ensure that the scope of work we are doing is appropriate to meet the required outcomes and that the costs to deliver that work are as efficient as possible.

In recognition of the potential scale of our WINEP, we commissioned Arup to run an independent scrutiny and challenge process on the development of our PR24 WINEP. To support the scrutiny and challenge process an independent panel of experts were convened for the purpose of reviewing and further challenging the scrutiny findings developed by Arup. The Independent Scrutiny Panel comprises experts across customer, environment, delivery/cost, social value and policy/regulation, with the aim of the Panel being to help ensure that whilst the WINEP programme meets regulatory requirements it also adopts innovation to keep costs as affordable as possible and to enhance resilience and environmental and social value. The Panel concluded:

'It is reassuring to see the company embracing and positively responding to the key challenges set by the panel of independent experts on its WINEP programme. Whilst the company's WINEP programme is, by necessity of the environmental issues to be resolved in the North West, both substantial and complex the panel is encouraged to see a carefully balanced programme being developed. The use of adaptive planning was noted by the panel who strongly supported the approach to ensure further optimisation of value for money and reductions in carbon as solutions are refined through experience. The Panel is also pleased to see the company's open and progressive approach to the benefits of innovation and partnership working and how these will help it meet compliance cost effectively whilst also adding social and environmental value'

Source: WINEP Scrutiny & Challenge, Independent Review Report – Final, January 2023

8.9.2 Innovation and optimisation of solutions

As set out in section 8.4, in building our plan for AMP8 we conducted extensive optioneering, including innovative technology and new ways of working, blue/green and hybrid solutions, to identify the options that would deliver the best value. Through innovation and optimisation of solutions we are targeting a stretching £830 million of savings across our AMP8 enhancement plan.

Innovation shaping solutions

As set out in section 8.5.3, we have a strong track record of innovation and the development of solutions has been aided by our continual exploration of new ideas and technology.

The successes and learnings from our innovation pilots helped to shape the solutions we put forward in our AMP8 enhancement programme, including:

- A pilot roll out of smart meters to help us better understand the impacts and benefits of this technology and the readiness of our IT systems;
- Trial of a partnership funding approach, co-funding integrated rainwater management solutions in schools with the Department for Education; and
- A pilot looking at the feasibility of property-level separation of waste and rainwater, which was a lot more complex than anticipated. This understanding helped us to focus our plan on alternative options, such as street level separation and nature-based solution.

As well as factoring in trialled innovations, our plan includes additional 'stretch' efficiency in our enhancement programme to reflect new innovations to be developed over the plan period. Our ability to adopt innovations quickly helps us to capitalise on these opportunities. The Technology Approval Board (TAB) process we developed in AMP7 allows us, and our partners, to progress technologies into approval without the need to trial, drawing on our track record and expertise in managing the risks involved. For example, as detailed in section 2.3 of supplementary document *UUW49 - Innovation framework and strategy*, we were the first adopters of Mobile Organic Biofilm (MOB) technology in the UK, which was approved in the TAB and is now in detailed design and construction for our AMP7 scheme at Macclesfield. As a result of our success and learnings in AMP7, we have put further enhanced biological phosphorus removal sites into our AMP8 plan, some of which we also hope to adopt MOB as part of the solutions, enabling us to meet the requirement to reduce phosphorus levels in a more efficient, lower carbon and sustainable way.

Optimisation and value engineering of solutions

A number of options were considered for each AMP8 enhancement project, including solutions developed through our existing long-term plans such as WRMP and DWMP, identified through our AMP7 WINEP investigations, co-developed in conjunction with partners such as the Rivers Trust and National England, and new solutions trialled in the AMP8 pilots. For example, in our coastal and river erosion programme, all types of mitigation were considered (including the four R's of resilience) and 26 solutions progressed to detailed design and estimation to provide comprehensive cost and carbon data.

The optioneering approach and value assessment we undertook is described in more detail supplementary document *UUW45 - Our approach to deliver best value totex*. This looks at the ratio of the value delivered by a solution (performance improvement and anticipated wider value) by comparison to its cost (whole life cost and a quantified carbon 'cost'). This helps provide a consistent basis for comparison, and the preferred solution is typically the one with the best value ratio.

Information on the options considered and optimised solutions selected for each individual enhancement claim can be found in supplementary documents *UUW61-67*.

Designs for the best value solutions were challenged through value engineering, targeting a 10 per cent capex efficiency by delivering lean designs that meet the need in the most efficient way, as discussed in section 8.5.3.

8.9.3 Robust cost challenge and use of markets

As set out in section 8.5.4, we embrace the benefits that competition can deliver and maximise the use of markets to deliver a competitive service for customers. We have taken a robust challenge to our cost base, testing our cost estimates against available benchmark data and applying significant market efficiency stretch. Through robust cost challenge and effective use of markets, we are targeting to deliver our preferred solutions at a cost that is £376 million lower than our initial estimates based on cost curve data.

Robust cost challenge

Many of the steps we are taking to drive efficiency into our day-to-day activities, including our lean target operating model, maintenance excellence plan and digital optimisation strategy as set out in section 8.5.4, are helping to ensure efficient costs in our enhancement expenditure by minimising the in-house costs related to each programme of work. We have also applied highly robust internal and external challenge to the cost estimates in our plan.

Initial cost estimates were prepared using the Investment Programme Estimating System (IPES) – a bespoke parametric estimating tool that contains data from AMP3 to AMP7, to provide historic cost curves that are then inflated to the PR24 base date. Displaying these cost curves, alongside estimated data, IPES allows the capture, analysis and estimation of costs at a project and programme level. We then undertook progressive refinement of our cost estimates with the help of external reviews and benchmarking analysis, and have been able to tighten our cost estimates further.

Market testing was undertaken on a selection of projects representative of the scale and types of projects and solutions in the AMP8 programme, and the potential delivery routes, to ensure the costs established by our estimating team were appropriate. This confirmed that the contractor add-ons we have used are broadly representative of current market conditions.

The **independent scrutiny panel** reviewed our WINEP submission and supported our overall costs, looking holistically at risk exposure, overheads and transformation costs.

Comparative benchmarking was undertaken where adequate information is available to compare our costs against the industry, for example using DWMP data tables and APRs. This has allowed us to cross-validate the work we have done to drive efficiency into our costs over this iterative process. More information on the benchmarking we have done on the cost estimates for our enhancement programmes can be found in supplementary document(s) UUW60-67. As we discuss in our enhancement cases, where recent and comparable data was available, our benchmarking analysis found our submitted business plan costs align to similar

comparator companies. For example, our costs for storm tank storage (grey), network storage (grey and green), coastal and river erosion, and phosphorus removal were all efficient relative to analysis of available data.

Case study: storm tank storage (grey)

We used data from companies' 2023 annual performance reports to calculate the relative unit cost of each storm tank storage scheme at a company level. The sample size is relatively large, with most companies having completed schemes in the 2022/23 financial year, and there is a relatively small spread of unit costs, suggesting the range is credible. This analysis suggests that our proposed PR24 unit rate for grey storm tank storage is at the lower end of other companies' costs.

Deloitte assured our top-down benchmarking activity and did not find any issues, saying:

"UUW's other top-down benchmarking based on more recent data submitted by peer companies indicates that UUW PR24 costs are generally in line with expected costs."

This demonstrates that the top-down benchmarking information presented within our cost efficiency assessment has been assured by Deloitte and, as such, the findings can be considered robust.

We also engaged **Faithful and Gould** (F&G) to undertake a bottom-up deep dive into the cost efficiency of our enhancement cases. This involved a close examination of our cost base relating to a sample of our plan, with comparisons made to similar activity carried out by third party companies across a variety of sectors. F&G noted the effectiveness of our cost estimation process:

"In addition to the benchmarking data held by Faithful+Gould we understand that UUW has applied multiple internal and external challenges to progressively refine the cost estimation undertaken to date. In particular we note UUW's use of its IPES which is a bespoke parametric estimating tool containing data from AMP3 to AMP7, to provide historical cost curves alongside estimated data from third party organisations."

F&G found that our proposed costs are in line with rates typically seen across the industry:

"Overall, UUW's approach of utilising historic cost curves, market testing and obtaining specialist third party quotations demonstrates a sound proactive approach to cost planning. In total £1.2bn of schemes underwent targeted cost assessment with £573m making up the construction works element. After presenting our initial findings it was encouraging to see UUW's commitment to addressing our findings and applying these to the wider enhancement estimates, charting a strategic route towards greater efficiency and scope clarification. In light of this Cost Assurance work and evidence of UUW's responsive actions we have concluded that the data we have benchmarked is within a reasonable alignment with anticipated market rates."

Best value for money from the supply chain

With such a large enhancement programme that will rely heavily on external markets to deliver, and therefore incur significant third party costs in AMP8, applying the best practice methods we have developed during AMP7 will be a key enabler in delivering efficient AMP8 capital delivery.

As set out in section 8.5.4, we are stretching ourselves to deliver a 4 per cent saving on our third party spend in AMP8 through optimising the way we work with external markets. Meeting this ambition would achieve market efficiencies of £243 million on our enhancement programme, in addition to the savings in our base programme.

Standardised assets and products, value engineering and our 'design once build many' approach, will give us access to economies of scale. This will also reduce design time, helping to speed up delivery, which will be important in helping us to deliver such an ambitious programme over AMP8.

In addition, our runway delivery approach drives more efficient allocation and pricing of risk, enabling us to secure lower indirect costs. It will also give us access to a wider pool of suppliers, which will be important in AMP8 when we expect demand for contractors' services to be even greater, with significant investment programmes across the water industry in addition to our own, and competition from other large infrastructure projects.

Case study: Overflows programme

We have a large programme of work in our WINEP in relation to reducing the use of storm overflows. While we are exploring the optimal mix of traditional grey, blue/green and hybrid solutions, there will be significant overlap in designs needed across the region to deliver the improvements we are targeting to 437 different overflows.

This is an example where a build only delivery route can offer significant savings where we can draw on our experience – in our AMP7 Better Rivers programme, accelerated investment, and as we progress through our AMP8 programme – to optimise design efficiency.

This gives us opportunities to secure efficiencies through procurement and free issue of materials to build-only contractors based on an adopted modularised delivery approach.

Maximising the benefits offered by competitive markets

As discussed in section 8.5.4, we have embraced the use of markets in a number of ways. Within our enhancement programme, this includes exploring partnership opportunities as set out in section 8.9.4, direct procurement for customers as set out in section 8.9.5, and making it easier for third parties to provide services through the bid assessment framework.

- **Bid Assessment Framework (BAF):** In September 2022, we published a new BAF for bioresources alongside a revised BAF for water resources, demand management and leakage services. The purpose of these is to enable and encourage third-party bids to provide services. In developing the BAF we met with potential bidders and amended the draft to better enable bids, including changing the assessment criteria to support smaller and more discrete bids to be made. The guidance sets three key principles: transparency; equality/ non-discrimination; and proportionality. The supplementary document *UUW51: Bid Assessment Framework* sets out how our BAFs meet the expectations of these principles. As of July 2023, six bids have been received covering both water resources and bioresources, of which five are being progressed and the outputs will be incorporated within our plan. High level details of these bids is set out in section 5 of supplementary document *UUW51 - Bid Assessment Framework.*

8.9.4 Leveraging partnerships to drive greater value for money

Partnership working enables us to leverage greater value for customers and the environment, helping us deliver sustainable solutions, cost efficiencies, and additional benefits through pooling of resources. We have an ambitious plan to further grow partnership value in AMP8. For every £1 we invest in partnerships, we propose that a further 78 pence will come from partners to help deliver more value for customers and the North West.

In AMP8, we expect to invest £344 million in partnership working (assuming relevant programmes are supported in the Final Determination), and target a further £267 million of partnership funding. Just over a third of this benefits bills in our plan for AMP8, and the remaining two-thirds will deliver wider environmental and social benefits for the North West beyond the outcomes targeted by our plan.

This builds on additional partnership funding for innovation that we won during AMP7. We have attracted over £124 million of new funding, influencing over £94 million of the Ofwat innovation Fund and leading on £29 million – amongst the highest of all water companies. We will continue to support the increased Ofwat Innovation Fund during AMP8 to attract even more partnerships and drive further efficiency.

More information on partnerships, including a list of the relevant enhancement projects where we are targeting co-funding opportunities, can be found in section 6.7 of Chapter 6 and supplementary document *UUW38: Working in Partnerships.*

8.9.5 Direct procurement for customers (DPC)

We were the first company to adopt DPC in AMP7 with the pathfinder project, the Haweswater Aqueduct Resilience Programme (HARP). We have invested considerable time and effort in progressing HARP and developing the DPC model in collaboration with Ofwat, and support Ofwat's aim to make further use of DPC to provide better value for money for customers.

We have undertaken a proactive, thorough and considered assessment of DPC eligibility for all relevant projects, building on our experience through HARP and following guidance from Ofwat. We followed a two tier approach and separately identified individual projects and programmes of work, in both cases over the £200 million threshold. We identified a total of seven potential candidate DPC projects over five schemes that underwent Stage 1 strategic assessment. A further scheme that met the cost threshold was unsuitable for DPC for the reasons set out in Table 1 of supplementary document *UUW52: DPC overview*. Details of the strategic assessment process, and the outcomes of which projects were deemed suitable/unsuitable and why, can be found in supplementary document *UUW52: DPC overview*. The strategic case assessments for shortlisted schemes can be found in supplementary document *UUW53: Candidate DPC projects*.

Of the schemes assessed, we have identified one project bundle in AMP8 – Manchester Ship Canal BOD schemes – that we are proposing to designate for delivery by DPC, subject to agreement with the EA to amend the regulatory dates associated with the scheme to accommodate DPC. This bundle comprises one project over £200 million and others of similar scope that we have included to unlock economies of scale and maximise the potential applicability of DPC, with total scheme value of £269 million. We have also identified a further £344 million project for delivery under DPC (not currently designated as DPC in our submission) – Wigan and Skelmersdale wastewater treatment works – which is subject to reaching agreement with the EA to move the associated regulatory dates to allow delivery during AMP9, and the provision of an allowance for development and procurement activities to take place in AMP8. These are in addition to the over £1 billion expected value of the HARP scheme.

Our plan includes £27 million DPC management costs in relation to the Manchester Ship Canal BOD schemes, to reflect the costs for pre-construction activities, running the procurement process for DPC and managing the competitively appointed provider (CAP), and a further £25 million for HARP DPC management costs.

8.10 Assessing the cost efficiency of our enhancement projects

Our proposed methods of cost assessment

There is no one method of cost assessment that is appropriate for all enhancement costs. We have considered a variety of methods to assess our costs and propose that different methods can be used for different line items within the data tables, including modelling approaches, full cost pass through, shallow dive, and deep dive where the factors applicable to the enhancement are unique to the company and/or there are company-specific considerations that require more careful consideration.

The PR24 business plan data tables indicate that Ofwat will have access to a much richer dataset at PR24 than it did at PR19, improving the suitability of modelled assessments. It is important that these modelled assessments be based upon a principled understanding of the activities involved, otherwise technical modelling choices could result in an inappropriate benchmark and lead some companies to unduly benefit from the process.

We do not have access to other companies' business plans prior to submission, so we have been unable to develop and implement cost assessment models for enhancement costs but, in section 4 of UUW46: Cost assessment proposal, we set out principled methodological approaches that Ofwat could implement when it has received business plan data from companies. Key points include:

- It is important that costs are assessed by reference to forecast costs that are reflective of future conditions and account for changes in the relationship between cost and cost driver. As detailed in sections 8.5.1 and 8.5.2, the economy and the construction market have dramatically changed in the last few years, therefore the constant and coefficients within the PR19 enhancement models are unlikely to appropriately reflect the relationship between cost and cost driver within AMP8.
- We support an 'in-the-round' catch-up efficiency challenge to be applied to the total enhancement programme, much like that which was applied to WINEP at PR19, which helps to maintain the ability of companies to balance risk across their entire programme and therefore supports deliverability.
- We consider that the PR24 approach to enhancement modelling should align to that taken in botex modelling, where all companies receive the benchmark view of cost rather than the 'lesser of' approach taken at PR19. This will help to incentivise long-term efficiency and provide appropriate pricing signals to future reviews.

More detail on our proposed cost assessment methods can be found in *UUW46: Cost assessment approach*.

Deloitte undertook a top-down review of our approach to cost assessment and found it to be robust and appropriate, saying:

"Overall, UUW has performed econometric benchmarking on programmes totalling £3,908m in enhancement case costs. We did not find any material errors in this econometric benchmarking."

The benchmarking and external assurance we have obtained, as discussed in section 8.9.3, gives us confidence that this approach will demonstrate that our enhancement costs are efficient. Together with the cost assessment for base, discussed in section 8.7.1, this demonstrates that our proposed totex in our business plan is efficient, as shown in Table 8-9.

Table 8-9 - Cost assessment proposal totex compared with business plan proposed totex

FY23 price base (except retail, which is nominal)	WR	WNP	WwNP	BR	WS	RET
Modelled botex (post-efficiency)	318	2,114	2,276	499	5,207	742
Cost adjustment claims	186	-	85	173	444	-
Unmodelled costs	216	300	194	50	758	-
Base expenditure – cost assessment	**720**	**2,414**	**2,555**	**722**	**6,410**	**742**
Income for s185 diversions and infrastructure charge receipts	*-*	*98*	*91*	*-*	*189*	*-*
Enhancement expenditure (excluding reduced flooding risk for properties, which is included within modelled botex)	184	838	5,821	330	7,173	-
Total expenditure – cost assessment	**904**	**3,153**	**8,285**	**1,051**	**13,393**	**742**
Total expenditure – business plan	782	3,119	8,208	979	13,088	677

Note: Retail costs are presented in nominal terms as there is no inflationary allowance in this price control.

8.11 Readiness to deliver the plan

AMP8 will present new and unique challenges, for us and for the industry more generally. We have ambitious plans, with the largest ever five-year programme we have proposed and a very different mix of work than usual with a commitment to move away from grey towards more blue/green solutions.

UUW47: Deliverability sets out how we have the ability within our own operations and within that of our supply chain to expand our capacity and capability to meet the challenges of our plan at the rate required to deliver this seven-fold increase in investment. It also examines the impact of growth across the sector and how we have assessed supply chain constraints, key supply chain risks and how we intend to manage them to ensure deliverability of our plan, as well as detailing some specific resource and component availability risks that we have already mitigated.

This includes adapting our internal organisation and resources, for instance:

- Use of partnerships and a county approach, with individual county plans and dedicated stakeholder managers for each of the five counties we serve;
- Market engagement and assessment of capability and capacity, including capacity of equipment and materials;
- Developing a runway delivery approach, increased solution standardisation, and targeting a new operating model, as set out in section 8.5.4; and,
- Embracing innovation, as set out in the supplementary document *UUW49: Innovation framework and strategy.*

In order to ensure we had the capacity and capability in our supply chain, we carried out an exceptional level of supplier engagement. This was partly to be open and transparent as to the size of the opportunity for them, but also to listen to their concerns around levels of risk and delivery routes. The feedback we have received from both our existing supply chain and companies that have never worked for us before, is that the level of openness and detail that we have shared is beyond anything they have seen from any other water company. The feedback we have received has given us confidence that the market will respond to our AMP8 opportunity.

UUW47 also looks at how we can work better with external partners in order to maximise the efficiency and effectiveness of delivery and minimise the risks and disruption of non-delivery, and we have conducted extensive early engagement with the supply chain, including workshops and issuing Prior Information Notices (PINs).

8.11.1 Accelerated and transition investment

There are some programmes of work in relation to our regulatory obligations that we intend to start ahead of the commencement of AMP8.

Accelerated infrastructure delivery project
In June 2023, Ofwat announced its final decision for a number of infrastructure projects to be brought forward to ensure improvements are made more quickly. This included £1.5 billion of investment for United Utilities to deliver four programmes to improve river water quality and reduce discharges from storm overflows, including those into Lake Windermere. As a result of the iterative refinement and improved efficiency in our plan, the cost of these programmes is now estimated to be £1.2 billion.

£197 million of this has been accelerated to AMP7, helping to deliver these important improvements to rivers and other watercourses across the North West as early as possible.

Other transition investment
Our plan also includes a further £107 million of transition investment that we need to deliver before the beginning of AMP8:

- £90 million WINEP expenditure on projects that need to be brought forward into AMP7 in order to enable us to meet the regulatory delivery dates;
- £15 million preparatory work for our smart metering programme, to ensure infrastructure and system readiness for the large AMP8 roll out programme; and,
- £2 million enabling expenditure to manage growth at wastewater treatment works as part of a larger WINEP project that needs to be started earlier.

Bringing forward this investment will have a knock-on benefit, as it will assist in smoothing the profile of AMP8 contractor spend, mobilising the supply chain early and smoothing the demands on capacity.

Further details of our transition investment can be found in the commentary for tables *CW12* and *CWW12* in supplementary documents *UUW83* and *UUW84*.

8.11.2 Further deliverability considerations

Deliverability of our plan also requires that performance levels are achievable, the level of investment is financeable, and customer bills are affordable. These aspects are considered in other chapters across the plan:

- Read about our performance levels in Chapters 5, our strong track record of continuous improvement in Chapter 10, and the credible delivery of the proposals in our plan in the supplementary document *UUW48: Deliverability – overall plan*.
- Read about our financeability assessment in Chapter 9; and,
- Read more about our industry leading approach to affordability in Chapter 4.