Smart Metering Enhancement Business Case

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from Southern Water

The cost-benefit analysis in this enhancement case and the metering cost adjustment claim (SRN24 Meter Replacement Cost Adjustment Claim) assumes there will be 948,353 residential meters replaced with AMI meters in AMP8. As part of our assurance process for PR24 we identified a discrepancy between the replacements assumed in this enhancement case and the cost adjustment claim, and the total number of meters that would need to be replaced in AMP8. The correct number of residential meters to be replaced should be 934,340. The total number of meter replacements in AMP8 is 985,106 including business meters.

As the difference in meter numbers is less than 2% of the total meter volume, the change in meter numbers would not materially affect the results. The best value option would remain the proactive rollout of smart AMI meters across all WRZs in AMP8 under the revised meter numbers. We will update the meter numbers and associated costs and benefits in all future submissions of the smart metering programme enhancement case.

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Executive Summary

- We operate in an increasingly water stressed region of the UK. To ensure a future supply of high-quality drinking water for customers, our WRMP lays out the required interventions needed for the medium to long term.
- Smart metering is a crucial part of our WRMP and hence our PR24 business plan, acting as a key enabler for reductions in household consumption and customer-side leakage. Our programme will save 20.6Ml/d by the end of AMP8.
- Investing early in smart metering is a low regret strategy for managing our supply-demand balance, enabling the right sizing of very large supply schemes and minimising regret costs. Our WRMP provides the underlying rationale for rolling out smart meters. This enhancement case considers the different options for the rollout.
- Through AMP5 we delivered a metering programme and now 88% of our customers are metered. We plan to leverage this position and carry out a proactive smart metering programme where we replace 985,106 basic and AMR meters with AMI technology within AMP8.
- We chose this approach because it delivers the best option for customers over the long term, as well as providing assurance to successfully enable our household consumption and leakage reduction programmes. We estimate proactively rolling out smart AMI meters in AMP8 will provide a Net Present Value of £13.4m and will deliver £1.18 of benefits for every £1 investment.
- We require an additional £63m in totex allowance to successfully implement the new AMI technology and associated capabilities needed to deliver a smart metering service to our customers. This enhancement case is specific to upgrade costs and does not include costs associated with like-for-like meter replacement funded through base.
- We have opted for a combination of technology solutions which provide value for money to our customers over the long-term, meet our standards for security and fit with existing architecture, as well as deliver the rich and reliable read data needed to enable reductions in leakage and consumption.
- We are proposing to use an alternative delivery approach to finance our smart metering rollout in AMP8. This is reflected in the business plan data tables we have submitted. The details of our AMP8 project development costs and payments to a service provider, under an alternative delivery approach, are set out in SRN17 Direct Procurement for Customers & Alternative Delivery Model Technical Annex.
- For the purpose of the analysis in this enhancement case, we have assumed that smart metering will be funded through the standard totex framework. Should our alternative delivery approach not be accepted by Ofwat, we would need to revert to the cost profile included in this enhancement case.

Table 1: Summary of enhancement case

Summary of Enhancement Case	
Name of Enhancement Case	Smart Metering
Summary of Case	This enhancement case consists of costs associated with upgrading our existing metering infrastructure with AMI technology and the associated business capabilities required to fully enable smart metering.
Expected Benefits	• Reduction in per capita consumption (PCC) • Reduction in business demand • Reduction in customer-side leakage • Reduction in meter read costs • Wider benefits, such as enabling additional capabilities in network management, customer tariffs, and behavioural insight

Associated Price Control	Wholesale Water: Treated Water Distribution
Enhancement TOTEX	£63,424,000
Enhancement OPEX	£17,366,000
Enhancement CAPEX	£46,058,000
Is this enhancement proposed for a direct procurement for customer (DPC)?	No

1. Introduction and Background

Overlap with base funding and cost adjustment claim

- Based on our high meter penetration (second highest in the industry) and aging meter estate (96% of household meters and 79% of non-household meters reaching end of life by 2030), we need to replace our meters at a much higher rate than most other water companies.
- The average historical meter replacement rate for the sector is 3.4% for households and 3.3% for non-households, according to data reported by the industry through the Annual Performance Reports. Ofwat's models provide an allowance for this replacement rate.
- We have accounted for the implicit allowance (£22.8m) for like-for-like meter replacements, and require additional base allowance, as detailed in our cost adjustment claim, SRN24 Meter Replacement Cost Adjustment Claim.
- We have submitted a cost adjustment claim (£88.8m) to cover costs associated with the like-for-like replacement of the remaining meters, given we have many more meters than average and they are all rapidly reaching end of life.
- We have used the industry meter replacement outturn data reported in the Annual Performance Review (APR) 2020-21 and 2021-22 data tables to estimate the efficient cost of like-for-like replacements. Further detail on the calculations is provided in our cost adjustment claim.
- The scope of this enhancement case (£63m) is specific to the additional technologies (i.e. communications device and network) and business capabilities (i.e. data storage and analytics) required to install and operate AMI.
- We are proposing to use an alternative delivery approach to finance our smart metering rollout in AMP8. This is reflected in the business plan data tables we have submitted. The details of our AMP8 project development costs and payments to a service provider, under an alternative delivery approach, are set out in SRN17 Direct Procurement for Customers & Alternative Delivery Model Technical Annex.
- For the purpose of the analysis in this enhancement case, we have assumed that smart metering will be funded through the standard totex framework. Should our alternative delivery approach not be accepted by Ofwat, we would need to revert to the cost profile included in this enhancement case.
- The table below confirms the source of funding for each component of the smart meter rollout.

Table 2: Summary of costs included in the base funding, cost adjustment claim and enhancement case

Item	Funding source	AMP8 (£m)
Implicit allowance for like-for-like meter replacements (asset and installation cost)	Base	22.803
Cost adjustment claim for like-for-like replacements (asset and installation cost)	Cost adjustment claim	88.782
Meter communications unit	Enhancement	28.857
Communication network infrastructure	Enhancement	13.986
Smart metering operations centre	Enhancement	3.610
Operational resource	Enhancement	3.380
IT integration	Enhancement	10.200
Programme resource	Enhancement	3.391
Total enhancement	Enhancement	63.424
Total		**175.010**

Introduction to this enhancement case

- We pioneered metering in the sector through our Universal Metering Programme completed in 2016. The programme resulted in close to 90% of our customers being metered and a reduction in water consumption of up to 16.5%. (1)
- The savings achieved through our metering programme have played a critical role in managing water demand in our region. Upgrading our existing basic and automated meter read (AMR) meters with advanced metering infrastructure (AMI) technology will enable us to build on this success, delivering further demand reductions and broader benefits.
- This enhancement case covers the investment required to implement new AMI technology and the associated business capabilities required to store and process usage data generated by smart meters. This includes:
  - Additional devices to connect to an AMI communications network
  - AMI communication network (e.g. connection to a network technology such as [redacted] or [redacted])
  - Meter Data Management System (MDMS)
  - Data analytics (e.g. to identify customer side leaks)
  - Customer engagement tools (e.g. usage visualisation, appointment booking)
  - Workflow tools to manage customer interactions relating to leakage or usage
  - Wider use cases, such as enabling water balance calculations
- Enhancement costs are estimated to be £63m for AMP8 as summarised in the table below. Costs have been generated through an assessment of industry benchmarks, market engagement, and review of historic programme costs. Further information on each of the cost items is provided in Section 3 and 4.

Table 3: Costs included in the enhancement claim

		£m			
Item	Spend type	AMP8	AMP9	AMP10	Total
Meter communications unit	CAPEX	28.857	0	0	28.857
Communication network infrastructure	OPEX	13.986	23.861	23.861	61.708
Smart metering operations centre	CAPEX	3.610	0	0	3.610
Operational resource	OPEX	3.380	2.500	2.500	7.500
IT integration	CAPEX	10.200	0	0	10.200
Programme resource	CAPEX	3.391	0	0	2.511
	Total	63.424	26.361	26.361	116.146

- The primary drivers for moving to AMI technology are to enable a reduction in per capita consumption (PCC) through behavioural shifts as a result of more frequent reads, as well as a reduction in customer-side leakage (CSL) through earlier identification of leaks, not currently possible through bi-annual reads.
- Secondary drivers for moving to AMI technology are to enable more effective proactive and reactive network management, tariff optionality, operational efficiencies from, for example, avoiding visual and drive-by meter reads, and improved customer service through, for example, smoother home move journeys. In Section 3, we expand further on the tariff options we are considering, such as the rising block tariff, which would need smart metering information.

Meter replacements and installations included in this enhancement case

- Our current meter base consists of 934,340 household meters and 50,766 non-household meters, all of which are basic or AMR meters.

- Our proactive smart metering programme intends to replace all these meters with AMI capable meters within AMP8, as detailed within Annex 16 of our Water Resource Management Plan 2024 on smart metering.
- We expect new developments will adopt smart AMI meters by default. We have included the incremental costs for operating these meters (relative to installing AMR meters) within this enhancement case.
- We also plan to deliver 33,864 unmetered conversions in AMP8, but have not included the cost or benefits of these conversions in this enhancement case. This is a deferral of our AMP7 objective that contributed to our per capita consumption (PCC) aims, which we will do more efficiently as part of an area-by-area rollout in AMP8. We estimate that at the end of AMP8 we will have 92% meter penetration in selected Water Resource Zones.
- Table 4 below summarises our proposed proactive rollout of smart meters in AMP8 and the meters in and out of scope of this enhancement claim.

Table 4: Meter replacements and installs included in the enhancement claim

Type	Included in enhancement	2025-26	2026-27	2027-28	2028-29	2029-30	Total AMP8
Residential replacement – AMR	Included	60,254	125,564	162,193	138,707	108,940	595,658
Residential replacement – Basic	Included	33,224	70,411	86,877	97,633	50,537	338,682
Business replacement	Included	6,375	10,069	5,316	13,543	15,463	50,766
Total replacements		**99,853**	**206,044**	**254,386**	**249,883**	**174,940**	**985,106**
Residential new connections	Included	13,641	13,011	12,104	11,722	10,440	60,918
Total replacements and new connections		**113,494**	**219,055**	**266,490**	**261,605**	**185,380**	**1,046,024**
Unmetered connections	Excluded (AMP7 commitment)	7,089	6,860	5,325	8,196	6,396	33,866
Total meters		**120,583**	**225,915**	**271,815**	**269,801**	**191,776**	**1,079,890**

Links to business plan data tables and performance commitments

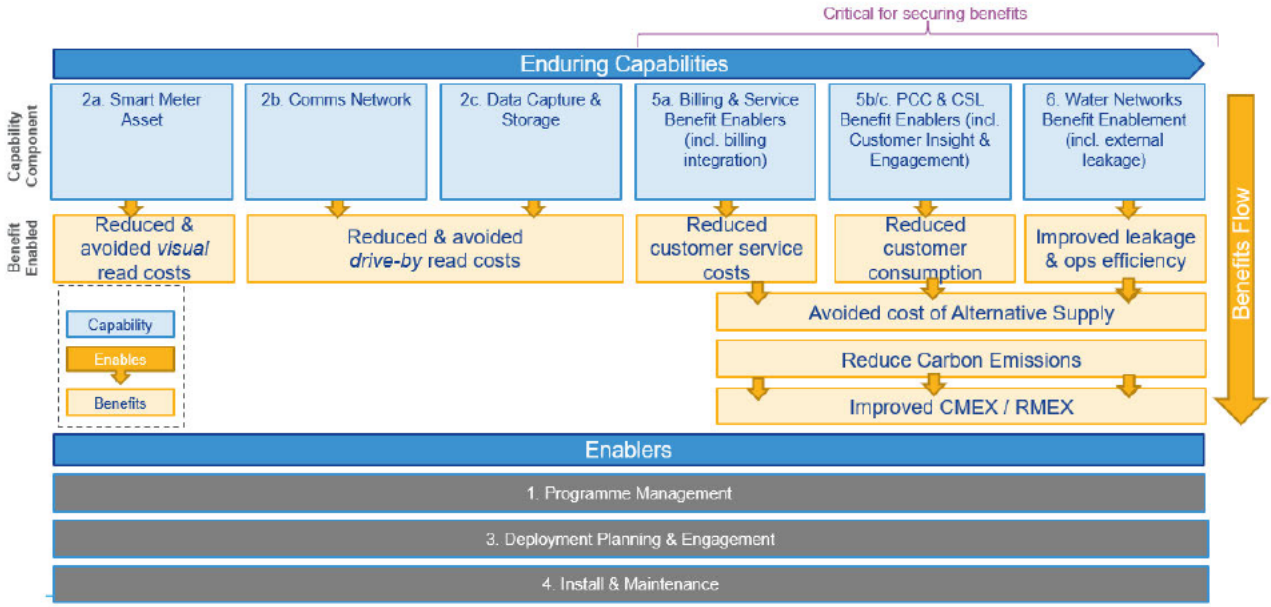
- This enhancement claim is reflected in data table SUP12 and RR9 as we are proposing to fund the smart metering rollout through an alternative delivery approach. We have therefore not included any smart metering enhancement costs in CW7 or CW3. Should our alternative delivery approach not be accepted by Ofwat, we would need to include the cost profile presented in this enhancement case in the CW7 and CW3 tables.
- Smart metering is a key contributor to our per capita consumption (PCC), business consumption, leakage and operational carbon performance commitments. Table 5 below summarises the savings attributed to smart metering for each of these commitments. Further detail on our performance commitments can be found in SRN18 Performance Commitment Methodologies Technical Annex.

Table 5: Links to common/bespoke performance commitments

Performance commitment name	Unit of measurement of benefit from this investment	Changes attributed to smart metering
Per capita consumption (PCC)	l/p/d	Forecast reduction of 4.00 litres per person per day by the end of AMP8 attributed to smart metering, equivalent to 11.13ML/d
Business consumption	ML/d	Forecast reduction of 2.58ML/d by the end of AMP8 attributed to smart metering
Leakage	ML/d	Forecast reduction of 6.91ML/d by the end of AMP8 attributed to smart metering
Operational carbon	Tonnes CO_2	Forecast increase in (gross) CO_2 emissions in AMP8 due to installations, followed by a reduction in AMP9 onwards

- As a standalone activity, like-for-like replacement of meters with AMI enabled meters is not sufficient to enable any new benefit. We require additional technologies and capabilities to fully enable a true smart metering capability, as outlined in the figure below.
- Through AMI enabled meters (2a), communications network and device (2b), and meter data management system (2c), we expect to achieve hourly read data, reducing the need to conduct visual and drive-by reads, unless due to a fault.
- The key benefits associated with smart metering (such as reduction in consumption and customer-side leakage) can only be realised once data analytics capabilities, customer propositions, and integration with billing systems are in place.
- As a collective, these components will drive a number of significant customer and business outcomes, including insights into usage behaviour, improved leak targeting activity, and reduced customer service costs.
- Longer-term, the smart metering programme will enable wider water network benefits, but this is dependent on other changes outside the scope of the smart metering programme.

Figure 1: Summary of capabilities required to deliver smart metering benefits



2. Needs Case for Enhancement

2.1. Strategic context

- We operate in an increasingly water stressed region of the UK. The combined effects of population growth and climate change are expected to place increasing pressure on our water supplies. By 2040, without further action, all of our Water Resource Zones are expected to be in water deficit (Figure 2). (2)

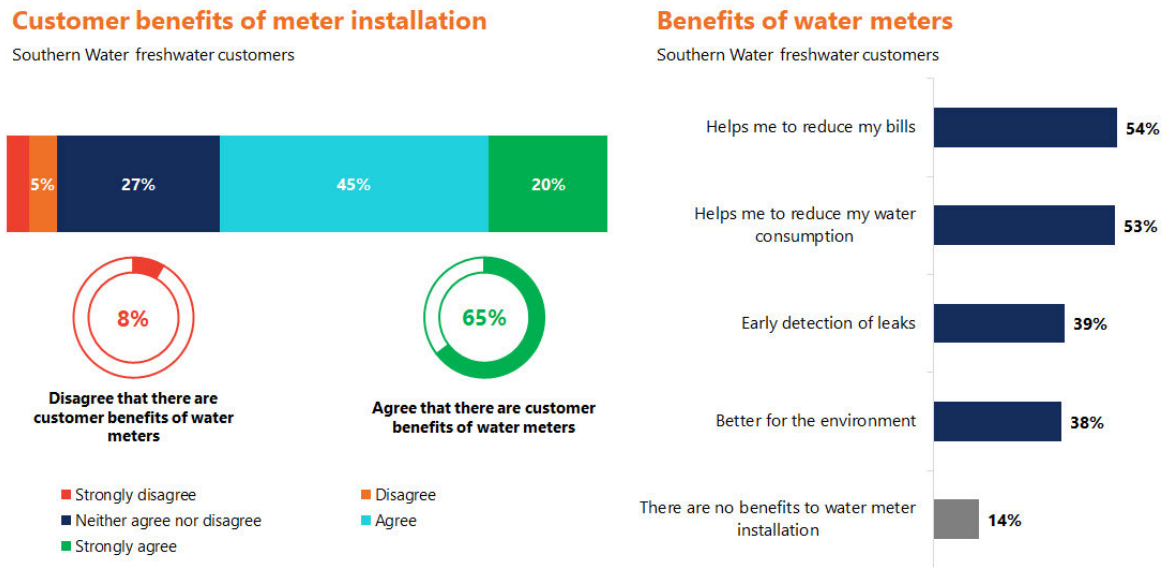
Figure 2: WRMP baseline water supply-demand balance by Water Resource Zone at five-yearly intervals (Ml/day)

	2025	2030	2035	2040	2045
Hampshire Andover	5	2	2	-11	-11
Hampshire Kingsclere	4	3	0	0	-1
Hampshire Rural	2	2	-1	-1	-1
Hampshire Winchester	2	2	-8	-20	-21
Isle of Wight	-12	-12	-13	-27	-27
Kent Medway East	-11	-18	-23	-47	-60
Kent Medway West	-13	-18	-20	-32	-38
Kent Thanet	-5	-12	-16	-33	-36
Hampshire Southampton East	-74	-93	-96	-98	-100
Hampshire Southampton West	-46	-46	-47	-45	-46
Sussex Brighton	-14	-23	-24	-51	-54
Sussex Hastings	-8	-10	-11	-12	-13
Sussex North	-44	-67	-64	-66	-69
Sussex Worthing	-3	-4	-13	-21	-25

- To ensure a future supply of high-quality drinking water for customers, our WRMP24 lays out the required interventions needed for the medium to long term. Our WRMP24 is part of a regional solution set out in the Water Resource South East (WRSE) region-wide plan for water resources developed by an alliance of six water companies.
- Demand management is a major focus of our WRMP24. Reducing demand provides significant benefits by delaying, avoiding or reducing the need for investment in very large supply schemes. Given the uncertainty around future supply-demand balances, it also provides strategic optionality, reducing the likelihood of regret costs in the event our central projection does not materialise.
- Smart metering is a crucial part of our WRMP24 and hence our PR24 business plan, acting as a key enabler for reductions in household consumption and customer-side leakage. Our proactive smart metering programme intends to replace all meters with advanced metering infrastructure (AMI) capable meters within AMP8, as detailed within our WRMP24 Annex 16 Smart metering.
- The universal replacement of meters with Smart AMI meters in AMP8 across all our Water Resource Zones is consistent with the Best Value Plan in our WRMP24. Our plan considers a wide range of factors alongside economic cost and seeks to achieve an outcome that increases the overall benefit to customers, the wider environment and society. Our WRMP provides the underlying rationale for the rollout, and the demand savings included in our WRMP are dependent on replacing all existing meters with smart meters in AMP8.
- The proactive replacement of all our meters will enable the rollout to be delivered cost effectively and accelerate the delivery of smart metering benefits, which are critical for achieving our consumption reduction targets. Around 96% of household meters and 79% of non-household meters will be 15 years old by the end of AMP8. These meters will have reached the end of their expected life and will need to be replaced for us to continue to accurately measure consumption and ensure we are compliant with statutory obligations. (3)

- Rolling out smart meters across all our Water Resource Zones enables the broader benefits of smart metering to be provided across a large proportion of our customer base. This includes the operational benefits from avoided meter reads, reduction in the cost of water production, carbon savings and improved customer service. In our cost-benefit analysis we demonstrate that rolling out smart meters delivers a net benefit in each Water Resource Zone, including in those that are less water stressed.
- The rollout of smart meters to household and non-household customers is supported by government policy and regulation:
  - Defra's Plan for Water policy statement published in April earlier this year highlights that the government "is encouraging water companies to consider how to rapidly increase smart meter installations for household and non-household customers" given the benefits they deliver. (4)
  - Reducing consumption through capabilities enabled by AMI technology will help to meet water demand targets set under the Environment Act 2021, to reduce the use of public water supply in England per head of population by 20% by 2038.
  - Defra has confirmed its target for water companies to reduce water consumption in the Non-Household (NHH) market by 9% by 2038. MOSL (the NHH Market Operator) released its interim metering strategy in April 2023 which stated "the Strategic Panel calls on all water companies roll out smart (AMI) metering to NHH customers in AMP8". (5)
- The benefits of meters are widely understood by our customers and the move to smart metering is expected by many of our customers. Findings from recent customer research suggest that 65% of our customers agree that they would benefit from smart meters and the majority (53%) agree they would help reduce their consumption and bills. Other industry studies, for example by Waterwise and Arqiva, provide further support for these findings. (6) We have yet to launch our consumption and leakage reduction water scarcity engagement and communications campaigns and would expect the proportion of those customers in agreement to rise considerably as we adopt the strategy.
- Further details on the results of our customer engagement are provided in Appendix 1.

Figure 3: Customer views on smart metering



2.2. Low regret assessment

- We have assessed the smart metering programme against the criteria for low regret investment identified in the LTDS guidance and Appendix 9 of the Final Methodology. The guidance identified that low regret investments meet the needs across a wide range of plausible scenarios, meet short-term requirements; or keep future options open, including cost minimisation.
- We consider that the investment proposed in this enhancement case is a least regret investment for the following reasons:
  - Needs – Many of our water resource zones are already in deficit as shown in Figure 2 above. Smart metering can deliver benefits much quicker than the supply side alternatives given the shorter lead-time for rolling out AMI meters. We have statutory targets for both PCC and leakage and smart metering is an essential component to achieving these.
  - Timing – Around 96% of household meters and 79% of non-household meters will reach the end of their expected life in AMP8 and will need to be replaced for us to continue to accurately measure consumption and ensure we are compliant with statutory obligations. Replacing all meters with AMI meters in AMP8 (rather than like for like replacement with VMR or AMR meters) enables the smart meter rollout to be delivered efficiently and accelerates the realisation of benefits.
  - Optioneering – The proactive rollout of AMI meters delivers the highest overall net benefit of the options assessed. A range of options were considered to meet the need across a range of plausible futures. Further detail is provided in Section 3.
  - Future scenarios – The solution is required across a range of scenarios as demonstrated in our WRMP. This enhancement case therefore focuses on the different options for rolling out smart meters as the need for smart metering has already been justified.

3. Best Option for Customers

- This section describes the options assessed and the assumptions used to estimate the costs and benefits of each option. We combine this information for our cost-benefit analysis to identify the best value option for customers. In recognition of the uncertainty around future costs and benefits, we have

undertaken additional sensitivity analysis on key assumptions to demonstrate the robustness of the conclusions.

- Our best value option for customers is the proactive rollout of smart meters across all our Water Resource Zones (Option 1e). This provides the highest overall benefit-to-cost (BCR) ratio and Net Present Value (NPV), and provides significant additional non-monetised benefits. The table below provides a summary of the cost-benefit analysis. We provide further detail behind these figures in the following sections.

Table 6: Summary of cost-benefit analysis

Option	Description	AMP8 cost	NPV	BCR	Comment
1b	Replace existing meters on fail with AMR technology (baseline)	£124.3m	-	-	Baseline against which other options assessed
1c	Replace existing meters on fail with AMI technology	£189.1m	-£10.9m	0.89	Highest cost in AMP8 due to reactive rollout and the need to replace most meters, but positive NPV due to smart meter benefits
1e	**Proactively replace existing meters with AMI technology in AMP8 (preferred)**	**£175.0m**	**£13.4m**	**1.18**	**Highest NPV and BCR, and significant additional non-monetised benefits**
1f	Proactively replace existing meters with AMI technology only in Water Resource Zones that have a water-deficit by the end of AMP8	£172.2m	£10.1m	1.14	Lower cost than 1e in AMP8, but cost savings from replacing fewer meters with AMI meters outweighed by lower benefits
1g	Proactively replace existing meters with AMI technology in AMP8 and AMP9	£164.0m	£10.7m	1.14	Lower cost in AMP8 than 1e, but cost savings outweighed by delay in benefits and programme costs extended into AMP9

3.1. Optioneering

- We have considered a wide range of options for the smart metering programme which vary in scale and timing of the rollout.
- Southern Water's standard Risk and Value approach, described in Part A of the Optioneering and Costing Methodology for Enhancements annex was followed during optioneering for this solution. This involved wide stakeholder engagement including Southern Water experts, supply chain partners, operations personnel and asset management leadership to produce a long list of potential solutions. These were then reviewed for feasibility and affordability to obtain a short-list of solutions which were then investigated, costed and benchmarked to constrain the short-list to Lowest Cost and Best Value options, one of which has been chosen to progress.
- The following seven options were identified of which five have been shortlisted for the cost-benefit analysis:

  - **Option 1a: Do not replace existing meters when they fail (not shortlisted)**. This option is not viable and has therefore not been shortlisted. We need to replace meters that fail to continue our

ability to accurately measure consumption and ensure we are compliant with statutory obligations. Any such significant under-registration of meters would be in breach of our statutory obligation to maintain meters to a prescribed level of accuracy.

- **Option 1b: Replace existing meters on fail with AMR technology (shortlisted, baseline)**. This option would involve replacing existing household and non-household VMR and AMR meters with new AMR meters when the existing meters fail. This represents the minimum level of intervention necessary to maintain our current metering capability. We have therefore set this option as the baseline option against which we have assessed all other options in the cost-benefit analysis.

- **Option 1c: Replace existing meters on fail with AMI technology (shortlisted)**. This option is the same as Option 1b, except we would replace existing household and non-household VMR and AMR meters with smart AMI meters. This option would deliver benefits from smart metering that would not be delivered under Option 1b, although these benefits would not be realised until all existing meters have failed and been replaced with AMI meters.

- **Option 1d: Proactively replace existing meters with AMR technology in AMP8 (not shortlisted)**. This option would involve replacing all existing household and non-household meters with AMR meters in AMP8. The proactive rollout of meters would allow economies of scale to be achieved through a street-by-street approach. We have excluded this option as it would not be consistent with our demand reduction targets, dependent initiatives, and would likely result in the need to replace AMR meters with AMI meters before the end of the lifetime of the AMR meters.

- **Option 1e: Proactively replace existing meters with AMI technology in AMP8 (preferred**. This option is the same as Option 1d, except we would replace existing household and non-household VMR and AMR meters with smart AMI meters. This option would deliver the benefits of smart metering and would also enable economies of scale to be achieved through a proactive rollout, driving down costs. As part of our rollout strategy, we plan to prioritise installing AMI meters in Water Resource Zones that are the most water stressed to ensure the benefits from smart metering are delivered where they are most needed. This option is included in our WRMP Best Value Plan.

- **Option 1f: Proactively replace existing meters with AMI technology only in Water Resource Zones that have a water-deficit by the end of AMP8 (shortlisted)**. This option would involve rolling out smart meters only in Water Resource Zones where there was already a clear need for demand management to help restore the demand-supply balance. It is the same as Option 1e, but we would only rollout smart meters in 10 of the 14 Water Resource Zones in our supply area. The four Water Resource Zones not covered by the smart metering programme would be Hampshire Andover, Hampshire Kingsclere, Hampshire Rural and Hampshire Winchester. For the purpose of the cost-benefit analysis, we have assumed we would maintain a reactive replacement approach in these zones, replacing existing VMR and AMR meters that fail with AMR meters.

- **Option 1g: Proactively replace existing meters with AMI technology in AMP8 and AMP9 (shortlisted).** This option is equivalent to Option 1e, but we would rollout smart AMI meters over a 10-year period instead of a 5 year period. In AMP8 we would replace 96% of household and 79% of non-household meters with smart AMI meters through a street-by-street approach, and replace the remaining meters in AMP9 closer to the date when they are expected to reach the end of their lifetime. This would mean all our meters would be smart AMI meters by 2035 which would be consistent with Ofwat's faster technology scenario in its long-term delivery strategies. The high number of replacements in AMP8 relative to AMP9 would be needed as these meters are expected to reach the end of their lifetime by the end of AMP8 (see Table 8 below).

Table 7: Meters reaching end of life within each AMP

	Units	AMP8	AMP9	AMP10
Household meters	% HH meters	96%	3%	1%
Non-household meters	% NHH meters	79%	13%	8%
Total	% meters	95%	4%	1%

- Across all options we have adopted our WMRP property growth forecast that there will be 60,918 new connections which will be fitted with AMR meters in Option 1b and 1d, and AMI meters in Option 1c, 1e, 1f and 1g. The total number of meter installations included in the enhancement case is 1,046,024 when the new connections are added to the 985,106 replacements of existing meters.
- The options for financing the rollout have been considered separately to the rollout strategy and are discussed in more detail in the PR24 submission and business case for alternative financing for smart metering supporting document. We are currently undertaking market engagement to better understand the smart metering services that an individual provider would be willing to bundle and finance. Our final proposed approach to financing the rollout will be dependent on ongoing discussions with Ofwat. For simplicity, we have therefore excluded the costs of financing from the cost-benefit analysis.
- We identified the following three high-level options for financing the rollout, two of which have been shortlisted:

  - **Option 2a: Finance the replacement of meters via totex (shortlisted)**. This would involve Southern Water financing the rollout and recovering the costs of investment through the Pay As You Go and RCV run-off. Southern Water would earn a regulated return on the investment.

  - **Option 2b: Finance the replacement of meters via DPC (not shortlisted)**. This would involve running a DPC procurement process to select a Competitively Appointed Provider to complete the smart meter rollout. This option has not been shortlisted following updated guidance issued by Ofwat confirming that DPC is not intended for smart metering. Ofwat expects DPC projects to have an asset life not materially less than the average 25 year lifetime for a CAP agreement and for individual assets in a bundled project to be at least £5-10m.

  - **Option 2c: Finance the replacement of meters via an alternative delivery route (shortlisted)**. This option would involve contracting with a special purpose vehicle that would finance and deliver the smart metering rollout. We are currently exploring which smart metering services investors would be willing to bundle and the options around the main components of a contract.

- We are proposing to use an alternative delivery approach to finance our smart metering rollout in AMP8. This is reflected in the business plan data tables we have submitted. The details of our AMP8 project development costs and payments to a service provider, under an alternative delivery approach, are set out in SRN17 Direct Procurement for Customers & Alternative Delivery Model Technical Annex.
- For the purpose of the analysis in this enhancement case, we have assumed that smart metering will be funded through the standard totex framework. Should our alternative delivery approach not be accepted by Ofwat, we would need to revert to the cost profile included in this enhancement case.

3.2. Cost-benefit analysis

- We have undertaken a robust cost-benefit analysis of the smart metering programme to identify the best value option for customers. In this section we provide an explanation of the costs and benefits included

in our analysis. We estimate the Net Present Value and Benefit-to-Cost ratio of each option using standard assumptions from the HMT Green Book. (7) We also include sensitivity analysis along with an explanation on our approach to managing risks from the rollout.

3.2.1. Analytical approach

- The cost-benefit analysis considers the costs and benefits over a 30 year appraisal period.
- All costs and benefit values are expressed in 2022-23 prices.
- The costs and benefits of the baseline option have been subtracted from each of the other options to estimate the incremental cost and benefit of each option.
- The incremental costs and benefits of each option have been discounted to 2023-24 at the Social Discount Rate in the HMT Green Book to calculate a Net Present Value.
- We have only included the costs and benefits of a single replacement cycle of each existing meter. We have adopted this approach so that we treat each option fairly. Choosing a shorter appraisal period would result in the costs and benefits associated with the reactive replacement options in later years being excluded from the assessment.
- We have allocated costs to the year in which they are incurred. We have not spread the costs over time to reflect how they would be recovered from customer bills, or how an alternative provider may finance them. We are currently reviewing the different options for financing the rollout of smart meters. In the event an alternative financing route is chosen, we will adjust related claims to take account of the intended delivery mechanism.

3.2.2. Costs

Installation and asset costs for like-for-like replacements

- We have included the full cost of replacing a meter in our assessment of all options to provide transparency on the overall cost of each solution.
- Our like-for-like meter asset and installation costs are based on the efficient cost calculated in our cost adjustment claim, SRN 24 Meter Replacement Cost Adjustment Claim.
- We estimate the efficient cost for a like-for-like replacement to be [redacted] for household meters and [redacted] for non-household meters. This has been calculated by taking the median cost of meter replacements in the Annual Report Data Tables for 2020-21 and 2021-22. Further details on the calculations can be found in the meter replacements cost adjustment claim.
- For the purpose of the cost-benefit analysis, we have applied a 20% uplift to the like-for-like replacement costs where the replacements are done on a reactive rather than proactive basis. This assumption is based on a conservative bottom-up estimate of the additional travel time and idle time involved with a reactive rollout, and the associated impact on installer productivity. We have tested the effect of removing this assumption in the sensitivity analysis.
- Our assumption is similar to the assumption adopted by Arqiva and Frontier Economics in their cost-benefit analysis of the smart meter rollout. Arqiva and Frontier applied a 20% reduction to all meter, installation and communications network costs for options involving a coordinated rollout of smart AMI meters.
- We have not quantified the broader inefficiencies of a reactive rollout, including on the need for dual communications plans and customer support to manage a mix of smart and basic or AMR meters over a longer period of time.

Communications network and device

- [redacted]

[redacted]

Table 8: Communications network costs provided in a recent RFI

Cost	[redacted]	[redacted]	[redacted]	[redacted]
£ per meter per year	[redacted]	[redacted]	[redacted]	[redacted]

Resourcing

- In order to successfully deliver our smart metering programme, we need to ensure sufficient resource and skills across each of the relevant elements, from deployment, customer contact, data and analytics, and benefit enablement.
- We have reviewed smart metering organisational structures at other water companies, as well as resources during our Universal Metering Programme to support our role sizing. Some roles are specific to AMP8 to support deployment, whereas other roles are enduring to effectively enable benefit (i.e. reduction in leakage and consumption). Our overall resource requirements are not as significant as required during our Universal Metering Programme as we are replacing existing meters (as opposed to installing new).
- We have estimated £3.4m in capex costs across AMP8 for resources associated with programme delivery. This includes management office roles accountable for overall smart metering delivery, as well as specific roles for leading each of the necessary capabilities, including business readiness, customer engagement and commercial management.
- We have estimated £3.6m in capex costs across AMP8 for resources associated with our Smart Metering Operations Centre. This includes roles responsible for planning and managing service providers to deliver the replacement of our existing meters with AMI technology across both household and non-household customer bases. We have also accounted for more technical roles, taking into account that AMI technology is complex, and we will need the right skillsets to manage these new requirements.
- We have estimated £3.4m in opex costs across AMP8 for operational resources. These are enduring roles to ensure we successfully realise forecast benefit attributable to smart metering. This includes behavioural and data scientists, responsible for managing initiatives to enable customer-side leakage and PCC reduction as well as interim additional customer contact resource, recognising the likely increase in inbound call demand during roll-out.
- We assume some programme delivery and Smart Metering Operations Centre roles continue into AMP9 where a 10 year proactive rollout or reactive rollout is undertaken (Option 1f).

IT integration

- In order to process the hourly read data captured from AMI meters, we need to configure and upgrade our IT systems.

- There are several IT elements needed to effectively process data from smart meters, including data collection, data repository, integration layer with existing billing system and data analytics.
- In addition, there are also customer-facing elements, including tools to help customers engage with their consumption and to understand how they can reduce their usage and leakage, as well as appointment booking capabilities.
- We have estimated £10.2m in capex costs across AMP8 for IT integration. Our IT and integration costs have been estimated based on previous programmes of a similar size and scale (typically 15-20% of programme costs). We provide further details on these costs in Section 4 on Cost Efficiency.

3.2.3. Benefits

Reduced consumption

- With smart meters, we can provide tailored advice to customers to help them reduce their water consumption. For example, smart meter data enables us to provide more accurate and frequent consumption information, offer targeted water savings advice and provide comparisons to peers.
- We estimate that through these channels, smart metering will lead to a 3-5% reduction in consumption relative to having a VMR or AMR meter, with 4% assumed in our central case.
- The top end of our range is informed by an independent study published by Frontier Economics and Artesia, on behalf of Arqiva. (8). We believe a 4% saving could be enabled through the combination of usage visualisation, and behavioural science to share regular, tailored advice to customers, which we have taken into account in estimating the costs of the smart metering solution (including data analytics, demand reduction tools, and behavioural scientists.
- The reduction in consumption delivers significant savings by avoiding the need for investment in large supply schemes and the associated operational cost of producing that water. We estimate the marginal capital costs of these supply schemes to be £4m per mega-litre per day based on the analysis of supply schemes included in our WRMP analysis. It also reduces the operational cost associated with producing that water, which we value at £100 per mega-litre per day.

Reduced customer side leakage

- Smart meters will also help us to address leakage on customer-side pipes by enabling the earlier identification of leaks.
- By the end of AMP8, we estimate leakage will be 6.91Ml/day lower as a result of smart metering, which is equivalent to a saving of around 7 litres per property per day. Further detail on the contribution of smart metering to our consumption and leakage targets can be found in SRN27 Water Resources – Demand Business Enhancement Case.
- Our estimate is lower than data from trials. For example, Anglian Water's Norwich/Newmarket smart metering trials provided evidence to suggest a leakage reduction benefit of 18.8 litres per property per day. (9) There is therefore an opportunity for us to outperform the assumptions included in our cost-benefit analysis.
- We value the reduction in leakage using the same marginal capital costs and operational costs as the reduced consumption benefit. The marginal capital costs are assumed to be deferred for the duration of the meter lifetime. We only count this saving from the point in time the water resource zone is in water deficit.

Avoided meter reads

- An important benefit from the smart metering is the reduction in meter reading costs. Smart metering enables the phasing out of walk-by and drive-by meter reads as meter reads can be collected remotely.
- Meter reads are currently collected on a 6 monthly cycle, meaning two meter reads per year are avoided per smart meter. In addition, there are a small number of move out and off-cycle reads that would be avoided with smart metering.
- We assume the cost of a visual meter read is [redacted] and the cost of a drive by meter read is [redacted]. Our estimated costs are based on outturn data from our existing service contract and are lower than costs

used in other smart metering studies, such as by Frontier Economics and Artesia in their assessment of the benefits of smart metering. (10)

- In addition to the reduction in operational costs, the avoided travel required for meter reads will reduce carbon emissions. We capture this as a qualitative benefit as part of our assessment of carbon savings.
- We include a conservative assumption that 10% of smart meters will not be able to maintain a regular connection. We assume these meters would need to be read visually at the unit cost specified above.

Carbon savings

- The proactive rollout of smart meters is expected to deliver significant carbon savings over the lifetime of meters following an initial increase in emissions associated with the travel required to install meters.
- Our performance commitments show an increase of carbon emissions attributed to smart metering of 10,144 tCO_2 in AMP8 followed by reductions of 3,946 tCO_2 in AMP9 and 4,059 tCO_2 in AMP10. The estimated savings do not include the additional benefit from the avoided travel required for meter reads. They also do not fully account for the savings relative to a reactive rollout where the travel distance per meter would be much higher than under a proactive rollout.
- We have captured the carbon savings as a non-monetised benefit in the cost-benefit analysis. This is because the cost of carbon is partly accounted for within the avoided cost of water production, which is the largest quantified carbon savings benefit.

Other non-monetised benefits

- Smart metering is an enabler to a range of other benefits that have not been quantified and included in this investment case. Some of these benefits may require additional investment that is not captured within this enhancement case.
  - More frequent reads will provide customers with a more accurate and near real time understanding of their usage. This will reduce the number of “bill shocks” as customers will be better informed of their consumption and will be able to take action earlier than would be the case with basic or AMR meters. Fewer bill shocks would lead to improved customer service levels and fewer customer contacts.
  - More accurate billing will help us manage customer debt more effectively. It will also help us to better target help to financially vulnerable customers.
  - Smart metering data can be used to improve the management of our network, for example alongside data from other sensors to find and fix supply side leakage.
  - Smart metering enables a more precise water balance calculation and provides opportunities to combine usage data with other sources (i.e., pressure/flow sensors, telemetry) to support operational decision-making, for example using digital twins.
  - Data from smart metering could be used to support the proactive maintenance of our assets, potentially delivering operational cost savings.
  - Smart metering enables tariff innovation and new payment management opportunities to be developed, providing greater choice to customers.

3.2.4. Results of the cost-benefit analysis

- The results of the cost-benefit analysis for each option are shown below. The NPV is calculated by taking the present value (PV) benefits over the 30 year appraisal period and subtracting the present value costs (net of the baseline). The benefit-to-cost ratio is calculated as the ratio between the PV benefit and the PV cost (net of the baseline).

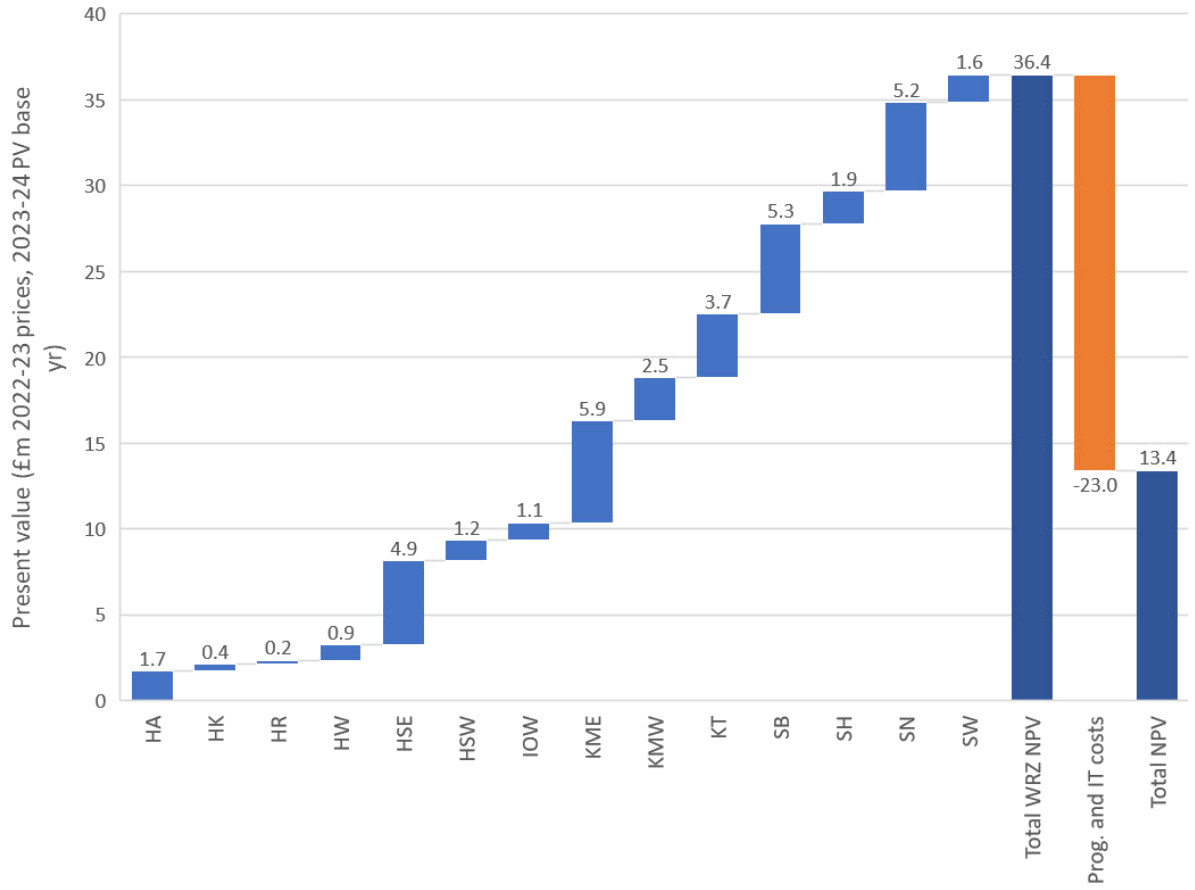
Table 9: Summary of results of cost-benefit analysis (2022-23 prices)

Option	Description	AMP8 cost	Total PV cost	Total PV benefit*	NPV*	BCR
1b	Replace existing meters on fail with AMR technology (baseline)	£124.3m	£119.2m	-	-	-
1c	Replace existing meters on fail with AMI technology	£189.1m	£220.6m	£90.5m	-£10.9m	0.89
1e	**Proactively replace existing meters with AMI technology in AMP8 (preferred)**	**£175.0m**	**£194.4m**	**£88.7m**	**£13.4m**	**1.18**
1f	Proactively replace existing meters with AMI technology only in Water Resource Zones that have a water-deficit by the end of AMP8	£172.2m	£190.6m	£81.6m	£10.1m	1.14
1g	Proactively replace existing meters with AMI technology in AMP8 and AMP9	£164.0m	£196.1m	£87.6m	£10.7m	1.14

* Present Value (PV) base year set to 2023-24. Costs in baseline subtracted from cost of each option in the calculation of the NPV and BCR.

- The proactive replacement of existing meters with AMI technology in AMP8 (Option 1e) delivers the highest NPV and benefit-to-cost ratio across all the options and is the preferred option. While it costs more than replacing existing meters with AMR meters, it provides significant benefits in the form of avoided meter reads, and reductions in per capita consumption, business demand and leakage. In addition, it provides a range of non-monetised benefits, and is an essential enabler to our broader demand management strategy. The benefit-to-cost ratio shows that for every £1 invested in smart metering, £1.18 of benefits are delivered.
- Replacing existing meters on fail with AMI technology (Option 1c) delivers similar benefits to Option 1e, but at a higher cost. This is because the reactive rollout of smart meters will be less efficient than a coordinated, area-by-area approach. Some programme resource costs will also continue into AMP9. As a result, the NPV for Option 1c is lower than Option 1e.
- The benefits shown for Option 1c are likely to be an overestimate. This is because a large proportion of meters are expected to reach the end of their useful life in the first two years of the AMP8 period, resulting in a faster rollout of AMI meters initially than under a proactive rollout.
- Similarly, replacing existing meters with AMI meters only in water resource zones in water deficit in AMP8 (Option 1f) results in a lower NPV than Option 1e. To show this, we have broken down the results by Water Resource Zone to demonstrate that installing smart meters in all areas delivers an overall benefit. The NPV for each zone varies due to the number of meters installed in each zone, the profile of required replacement in the baseline given the age of the current meter portfolio in each zone, and the timing of capital investment savings from demand and leakage reduction. The programme and IT costs have been included separately as these would effectively be sunk costs irrespective of the number of Water Resource Zones that smart meters are deployed in. Across all zones, the total NPV (excluding programme and IT costs) is £36.4m. The average benefit-to-cost ratio is 1.77 (excluding programme and IT costs), implying that for every £1 spent, an average of £1.77 of benefits would be delivered.

Figure 4: Net Present Value for each water resource zone



- The relatively low NPVs in the four Hampshire zones (HA, HK, HR and HW) are primarily due to the lower number of customers in those zones.
- The results only reflect the performance of each option for the costs and benefits that have been quantified. There are a range of non-monetised benefits that further support the case for the rollout of AMI meters, which are discussed below.

Enabler performance

- The smart metering programme is a key catalyst for our consumption and leakage reduction programme, which unlocks the potential for significant behaviour change.
- While Options 1b has a lower cost in AMP8, it does not provide any of the above benefits and as such do not align with the wider objectives set out in WRMP.
- Option 1c, 1e, 1f and 1g will provide the benefits, but a slow rollout of smart metering from 2025 to 2035 will delay the required benefits due to only partial customers having access to smart data, which adds significant risk to our overall demand management plan.

Customer performance

- Our customers agree that smart meters can help reduce water usage and support installation of smart meters. They expect to see their usage data for greater transparency and control and almost expect it as a norm, like their energy data.
- Options 1c, 1e, 1f and 1g will deliver on customer expectations by providing them with better data for them to manage their water usage. With Option 1e, customers receive the benefits of smart data

quicker and a consistent street-by-street rollout will generate efficiencies and CMEX benefits compared to Option 1f and 1c.

Affordability

- We have considered the potential impact on customer bills of each of the options. We believe proactively rolling out smart AMI meters in AMP8 strikes the right balance between minimising lifetime costs of the rollout and enabling earlier per capita consumption savings and associated bill savings.
- Proactively replacing meters with smart AMI meters in AMP8 would result in slightly higher costs in AMP8 than rolling our meters over 10 years (Option 1g) or only in selected Water Resource Zones (Option 1f). However, the lifetime costs of the rollout over a 15 year period would be lower as a result of efficiencies from an area-by-area rollout for all meters and because programme costs would not persist into future AMPs.
- In addition, smart meters will provide customers with better information on their water usage, enabling them to better manage their consumption, which would result in bill savings.

3.2.5. Sensitivity analysis

- We have undertaken sensitivity analysis to test the robustness of our results. For each of the key assumptions, we have calculated the switching value that would be required to switch the overall NPV of Option 1e from a positive NPV to a negative NPV.
- The proactive replacement of existing meters with AMI meters would still deliver a positive NPV if:
  - Avoided meter read costs were 87% lower than currently estimated (benefits lost = £13m)
  - The per capita consumption savings from smart metering were only 2.9%
  - Smart metering delivered no reduction in leakage (benefits lost = £11m)
- As demonstrated in the description of costs and benefits, it is unlikely that these scenarios would occur.

3.2.6. Risks management

- There are a range of risks to the smart metering programme that could result in a delay to the rollout and the realisation of benefits or an increase in costs. The table below provides a summary of the most significant risks and the steps we are taking to manage them.

Table 10: Main risks to the smart metering programme

Risk	Probability	Impact	Mitigations
Limited meter manufacturing and installer capacity in supply chain results in a delay to rollout and the realisation of benefits or cost escalation	M	H	We are currently undertaking market engagement to better understand this risk. Responses to a recent RFI we issued in July 2023 suggest replacing all meters with smart AMI meters in AMP8 is ambitious but achievable within the context of the plans across the industry for the rollout of smart AMI meters and existing supply chain capacity. Early contracting is essential for meeting these timelines. We are engaging with Ofwat to determine the appropriate alternative delivery model for smart metering. This will need to be agreed ahead of AMP8 to allow sufficient time for the procurement process to be completed.
Limited interest amongst investors for an alternative delivery	M	H	We are currently undertaking market engagement to gauge interest amongst investors for financing the smart meter rollout under an alternative

Risk	Probability	Impact	Mitigations
model results in high financing costs for the smart meter rollout			delivery route. Initial responses to the RFI issued in July 2023 suggests there is interest in funding the rollout. We are engaging with interested parties to better understand how the balance of risks influences the cost of finance and will adopt a solution that protects customers from high financing costs.
Site conditions result in more complex and expensive installations required than expected	M	M	We recently concluded boundary box surveys which have provided further evidence of the type of installation required. We propose including a rate card for each type of installation within the contract we issue for the replacement of meters to ensure the installer is incentivised to complete more complex installations.
Challenges securing customer appointments for meters inside the customers property result in delays to rollout and the realisation of benefits or cost escalation	M	M	We are currently developing our strategy for managing customer appointments. Our proposed strategy is likely to involve a combination of general awareness raising of the rollout of smart meters, targeted communications for areas we are soon to target for the rollout, appointment booking communications and follow-up communications to collect feedback that can be used to refine the appointment booking process.

4. Cost Efficiency

- We have used a range of evidence to estimate an efficient cost of smart metering which we have included in this Enhancement Case, including market engagement, benchmarking and third-party evidence.
- The table below summarises the main sources of evidence used. We provide further detail on each of these areas below.
- We note that any modelling of the efficient cost of smart meters by Ofwat will need to take into account the different network solutions. Some network solutions require an additional communications hub to be installed separate to the meter whereas others will have the communications capability integrated with the meter. There is therefore a need to ensure the replacement costs take into account the full cost of the network solution. The choice of network solution is dependent on a range of factors that may vary by area.

Table 11: Data sources for efficient cost estimates

Cost category	Type	Data source
Smart asset (£m)	CAPEX	Based on industry insight but ratified by initial responses from Procurement
Network Infrastructure (£m)	OPEX	Current view is based on best industry benchmarks and RFI responses

Cost category	Type	Data source
FTE+IT Costs (£m)	CAPEX	Based on internal estimates of enabling Smart Programme and IT capability

Smart AMI asset

- We undertook a detailed Request for Information (RFI) exercise in January 2022 to inform our estimates of the cost of smart metering. We received responses with indicative costs from a range of different providers, including Arad, Telefonica, Arqiva, BT, Connexin, Creative Network Consulting Ltd, Diehl, Elster Water Metering, Morrisons Data Services, Netmore, Network Plus, Suez Advanced Solutions and Vodafone.
- The respondents covered a range of different smart metering capabilities, including meter manufacturers, installers, communication network providers and data insight providers. Some respondents were able to provide services across more than one of these capabilities.
- The information received from the RFI has informed our estimate of the efficient cost of smart AMI meters, communications network infrastructure cost and ongoing data read costs.

Network infrastructure

- As part of our RFI we collected indicative costs on the communication network solution of different providers.

[redacted]

Table 12: Assumed efficient cost for network infrastructure costs

Cost	[redacted]	[redacted]	[redacted]	[redacted]	Assumed efficient cost
£ per meter per year	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total AMP8 cost	£8.60m	£9.95m	£13.98m	£20.72m	
Total AMP8-10 cost	£37.23m	£43.4m	£61.71m	£92.30m	

IT integration

- We have estimated £10.2m in CAPEX costs across AMP8 for IT integration. Our IT and integration costs have been estimated based on previous programmes of a similar size and scale (typically 15-20% of programme costs).
- [redacted] is our preferred option for primary meter data management and storage (MDMS) for several reasons, including that it is already present and proven within Southern Water, therefore reducing cost. This is an Internet of Things (IOT) hub and is scalable for Smart Meter data. Build effort will be required to adapt this solution for Smart Metering needs.
- [redacted] is our preferred option for smart metering data analytics—this software is already present within Southern Water IT architecture and therefore removes unnecessary costs or duplication of functionality as would be found with a new product.
- Our preferred option for customer proposition tool is to deliver an in-house solution. This approach would allow us to re-use our existing data analytics capability ([redacted]) to create the required information reducing cost. Through conversations with other water companies, we found this to be their preferred path also.
- [redacted] is our preferred option for appointment booking. [redacted] will be our strategic system (end 2023) for incident, customer and appointment management in wider business areas, and therefore removes unnecessary costs or duplication of functionality as would be found with a new product.

Industry benchmarking

- We have compared our estimated enhancement costs to Ofwat's Green Economic Recovery determinations to confirm that our smart AMI meter, network infrastructure and support costs are efficient. Ofwat's Green Economic Recovery determinations included allowances for three companies of £51 to £66 for the replacement of basic meters with smart AMI meters (2017-18 prices). Inflating these costs to 2022-23 prices using CPIH gives a range of £60 to £78 as shown in the table below.
- The allowances in the table represent "only the costs driven by the uplift in technology when a basic meter is replaced with a smart meter" as confirmed in Ofwat's Green Economic Recovery: Draft decisions document (11).
- In this enhancement case we are proposing to spend £63m in AMP8 to replace 999,563 basic and AMR meters with smart AMI meters, equivalent to £63 per meter (including support costs). Our estimated unit cost uplift for smart metering therefore falls below the industry benchmarks in the Green Economic Recovery determinations. For example, the equivalent unit cost allowances including support costs for Thames Water and South West Water were £70 per meter (+10%) and £78 per meter (+24%) respectively.

Table 13: Smart AMI meter unit cost allowances in the Green Economic Recovery determinations

Company	Activity	Allowance (£/meter, 2017-18 prices)	Allowance (£/meter, 2022-23 prices)
Severn Trent	Renewal of basic meters with Smart AMI meters	£51	£60
Thames Water	Renewal of basic meters with Smart AMI meters	£59 (incl. support costs)	£70 (incl. support costs)
South West Water	Renewal of basic meters with Smart AMI meters	£66 (incl. support costs)	£78 (incl. support costs)
Southern Water	This enhancement case	-	£63 (incl. support costs)

5. Customer Protection

- Smart metering is a crucial part of our WRMP and hence our PR24 business plan, acting as a key enabler for reductions in per capita consumption, business consumption and leakage. If investment in smart metering is cancelled, delayed or reduced in scope, we will incur outcome delivery incentive underperformance payments in these performance commitments. Please see our Methodologies for Performance Commitments Technical Annex for details on quantification of performance commitment benefits from smart metering.
- To protect customers from non-delivery of our smart metering enhancement case we believe there are already strong incentives for us to complete the smart meter rollout as planned. We have therefore not included a separate price control deliverable for smart metering. An underperformance payment on per capita consumption, leakage and business consumption would be significant if the programme was not delivered, equivalent to around £12 per smart meter. Coupled with the broader benefits from smart metering, such as reducing meter read costs and enabling better network management, there is a strong incentive for us to complete the smart meter rollout as planned.

6. Conclusion

- Smart metering is a crucial part of our WRMP and our PR24 business plan, acting as a key enabler for reductions in household consumption and customer-side leakage. Investing early in smart metering is a low regret strategy for managing our supply-demand balance, enabling the right sizing of very large supply schemes and minimising regret costs.
- We plan to replace all household and non-household meters with smart AMI meters in AMP8. This option delivers the best option for customers over the long term, as well as providing assurance to successfully enable our household consumption and leakage reduction programmes. We estimate proactively rolling out smart AMI meters in AMP8 will provide a Net Present Value of £13.4m and will deliver £1.18 of benefits for every £1 of investment.
- We require an additional £63m in totex allowance to successfully implement the new AMI technology and associated capabilities needed to deliver a smart metering service to our customers, as set out in this enhancement case.
- We are currently exploring different options for financing the smart metering programme in AMP8. Should an alternative financing route be adopted, the enhancement case will need to be updated to reflect the payment profiling under the alternative financing arrangement.

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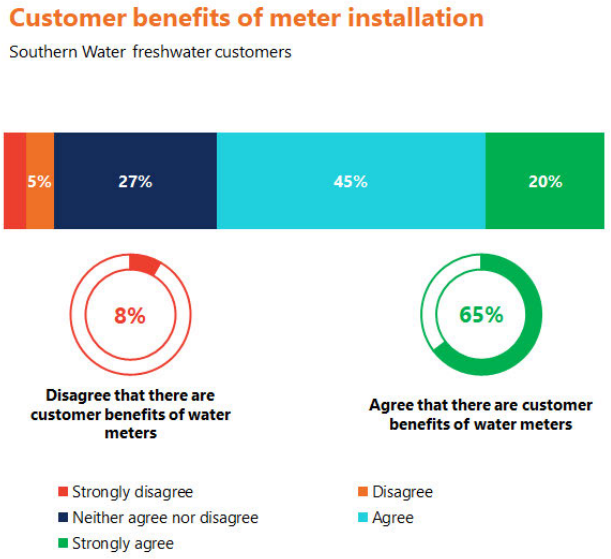
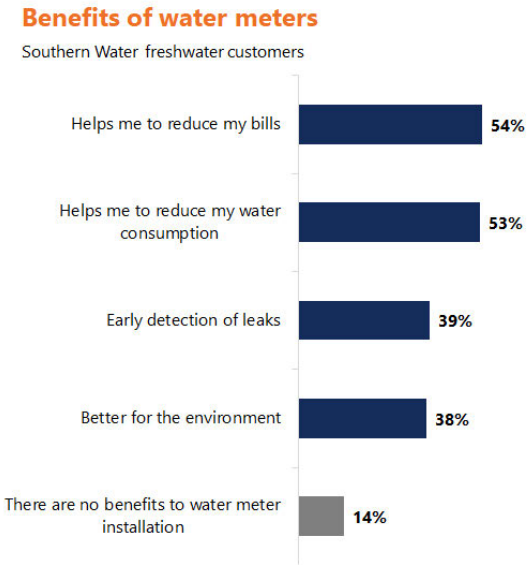
Appendix 1 – Customer survey results

- We have explored various hypotheses on the impact of smart meter rollout with our customers. These included an expectation that per capita water consumption will decrease and that leakage can be more quickly identified and resolved. We also elicited the customer's perspective on various smart meter subject matters such as the frequency and type of information they want to receive from us, types of messaging and communication and benefits and drawbacks.
- The benefits of water meters are widely understood by customers and span across three aspects - financial, behavioral and environmental. 65% of our customers agree that they would benefit from smart meters and the majority (54%) agree they would help reduce their consumption and bills.

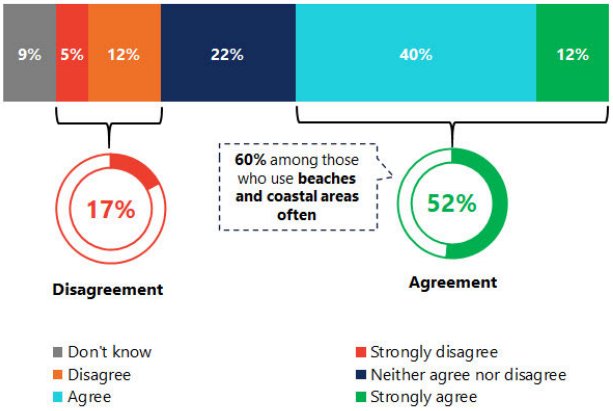




- For many, the principle of only paying for what you use through a water meter is seen as positive and fair. Increased accuracy and transparency of water usage is welcomed and helps encourage customers to be more water efficient, with 63% agreeing that checking consumption more often will help to reduce consumption.
- But the level of control and ability to monitor and understand water consumption is extremely limited due to insufficient and infrequent provision of information, making it hard to see the direct outcome on any behaviour change. This can lead to indifference towards having a meter i.e. it doesn't go far enough in empowering customers to offer real value.
- Our most recent engagement figures show 52% of our customers agree with us that smart meters can help reduce their water usage, and 59% support us on installing them. We have yet to launch our consumption and leakage reduction water scarcity engagement and communications campaigns and would expect those in agreement to rise considerably as we adopt the strategy.

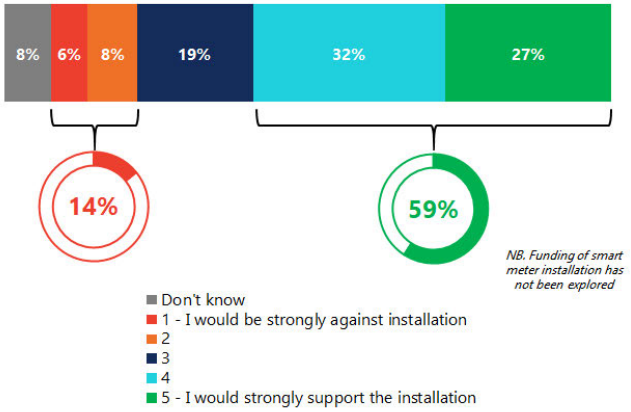
Smart meters and water reduction

Southern Water customers



Installation of Smart meters

Southern Water customers



C1. To what extent do you agree that having a smart meter installed helps people to reduce their water use?, C2. To what extent would you support Southern Water installing smart meters for water customers?
Base: Southern Water customers (1009), Use beaches and coastal areas often (481)

- The move to smart meters is almost expected but nonetheless improves positive perceptions of Southern Water. Financial savings, behaviour change and environmental benefits are mutually linked motivations supporting smart meters and they all form part of our communications strategy. This feedback has validated our thinking behind our smart metering programme and will help to guide us towards the option that is expected by our customers.

Appendix 2 – Additional detail on CBA

Table A2.1 – Breakdown of present value costs and benefits for each option

	Option 1b	Option 1c	Option 1e	Option 1f	Option 1g
Present value costs					
Meter asset and installation cost	118.7	118.7	96.6	98.6	96.7
Meter communications device	-	25.6	25.0	23.1	24.7
Communications network infrastructure	-	50.9	49.8	45.9	49.3
Smart metering operations centre	-	4.5	3.1	3.1	4.5
Operational resource	-	7.4	7.4	7.4	7.4
IT integration	-	9.5	9.5	9.5	9.5
Programme resource	-	3.9	3.0	3.0	3.9
Total PV cost	118.7	220.6	194.4	190.6	196.1
Present value benefits					
Avoided meter reads	-	17.2	15.4	14.3	14.8
PCC reduction	-	49.4	48.8	45.5	49.0
Leakage reduction	-	10.4	11.0	10.2	10.9
Business demand reduction	-	13.4	13.4	11.5	12.9
Total PV benefits	-	90.5	88.7	81.6	87.6
Summary					
NPV	-	-10.9	13.4	10.1	10.7
BCR	-	0.89	1.18	1.14	1.14