SRN24 Meter Replacement
Cost Adjustment Claim

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Version 1.0

from Southern Water

Contents

List of Tables and Figures

Cost Adjustment Claim: Meter Replacement

Name of claim	Meter Replacement
Business Plan Tables where botex claim is reported	CW18
Price control the claim relates to	WN+
Total gross value of claim for AMP8	£112m
Total implicit value of claim for AMP8	£22m
Total net value of claim for AMP8	£89m
Materiality for relevant price controls	£22m
DPC	Potentially

What is the claim for?

This cost adjustment claim reflects the higher level of meters we will be replacing in AMP8, over and above the average seen in the sector historically and captured in the base cost modelled allowances. We will roll out smart meters to all of our metered customers to help deliver our Target 100 ambition of reducing the average water usage to 109 litres per day per person by 2040. Our claim covers the additional funding required for the meter replacement programme (on a replacement of like-for-like) above the replacement rate funded by Ofwat through the econometric base cost models.

The claim covers the funding shortfall in replacing meters like-for-like due to:

a. Our early adoption of universal metering, as compared to the rest of the industry. The age profile of our meters means that 96% of our household meters (see Figure 2) and 79% of our non-household meters (Figure 3) will be over 15 years old by the end of AMP8 and need replacing. This means that our replacement rate at AMP8 will be much higher than the industry average replacement rate funded by Ofwat econometric models.

b. The higher proportion of our metered household customers at 88% (in 2022), compared to a sector average of 51.4%, over the sample period used in the econometric models (See Appendix 2).

The claim refers to the cost of replacing existing meters like-for-like, but across a much larger and older base of existing meters than the industry average. It does not include the uplift costs for replacing our existing meters with smart technology, which is a separate enhancement expenditure case in our business plan submission (SRN28 Water Resources – Smart Metering Enhancement Business Case). The smart metering programme is dependent upon the funding secured through this claim.

Test	Brief summary of evidence to support claim
Need for cost adjustment	The high level of meter replacement required by us is not reflected in Ofwat's assessment of botex requirements.
Uniqueness	We have the unique circumstance of old meters that need replacement (96% of our household meters and 79% on non-household metes will be 15 years old by 2030) and a high household meter penetration rate (88% compared to the historical sector average of 51.4%). Our replacement rate in AMP8 will reach 20%, much higher than the industry average, due to the age of our meters reflecting the pioneering roll out of our universal metering programme in AMP5 (2010-15) – see table in Appendix 2.
Management Control	Management control over the replacement of meters is limited. As a company in a water stressed area, we took an early proactive decision to roll out meters to ensure a resilient water supply to our customers. Those meters have now reached end of life and require replacing under our legal duty to maintain the accuracy of meters.
Materiality	The claim is material and is 4.11% of the forecast AMP8 WN+ totex allowance.
Adjustment to allowances	Our claim covers the additional funding required for the meter replacement programme above the replacement rate funded by Ofwat's base cost models on the basis of replacing existing meters like-for-like. The claim covers the funding shortfall due to the combination of having a higher proportion of household customers with meters, as compared to the industry average, and a higher than average replacement rate due to the age of our meters.
Cost Efficient	We have benchmarked our meter replacement programme against the median cost of replacement of basic and AMR meters across the industry in 2021-22 and 2022-23, adjusted to 2022-23 prices using CPIH.
Need for Investment	The investment is needed to replace customer meters which will be end of life in AMP8 to ensure compliance with our statutory obligations and guarantee accurate customer charging.
Best option for customers	We are undertaking a smart meter replacement programme which is key to our Water Resource Management Plan. The claim refers to the cost of replacing existing meters like-for-like which is a key enabler of our smart metering programme. Our options appraisal show that the smart metering roll-out has the best net cost-benefit position.

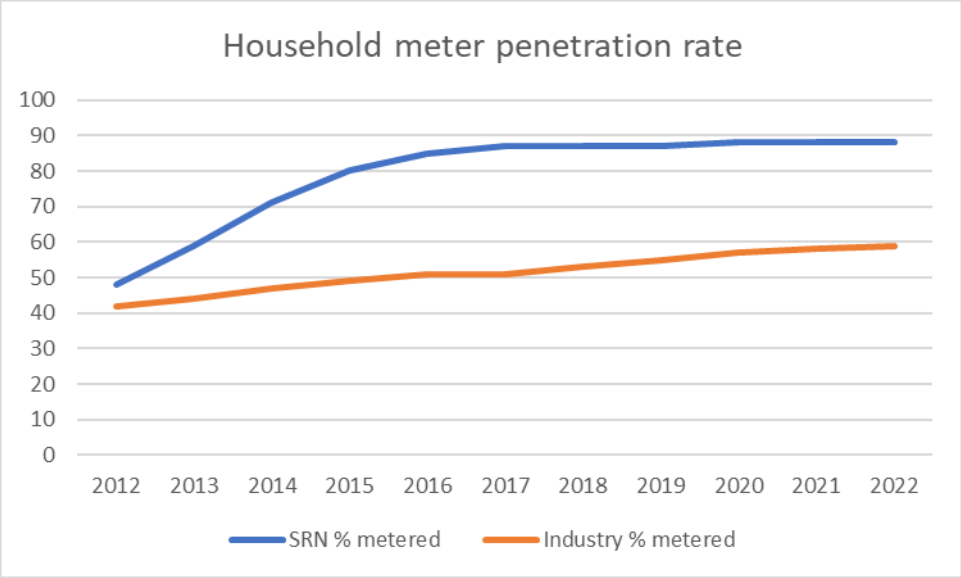
	We are also considering the use of Direct Procurement for Customers (DPC) or alternative financing models to undertake this smart metering programme.
Customer Protection	This claim refers to the cost of replacing existing meters like-for-like which is associated with our smart metering programme. Smart metering is 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.

1. Need for Adjustment

1.1. Why is Southern Water Unique?

Southern Water was designated by the Secretary of State as an area of serious water stress in 2007[1] and hence we were required to consider the case for universal metering. In our WRMP 2010-35 we consulted on and adopted a universal metering approach to encourage water consumption reduction.[2] We delivered this universal metering programme in AMP5 (2010-15) as a way to ensure a resilient water supply to our customers. This early roll out of meters has resulted in a significant improvement to our supply demand balance and is key to our Water Resources Management Plan.

Figure 1: Southern Water and industry average meter penetration 2012-2022



Source: Southern Water analysis of industry data collected through the Annual Performance Report (APR) data tables for 2020-21 and 2021-22 from table 6D and table 4R.

The early roll out of our universal meter programme in AMP5 (2010-15) has also resulted in us having an older meter stock than the industry average, with nearly all our meter stock coming up for renewal by the end of AMP8. This equates to a 20% annual replacement rate which is almost 6 times higher than the average water company replacement rate of 3.4% (see Appendix 2) funded by the Ofwat econometric models.

Our pioneering universal metering programme has also led to us having the second highest level of household meter penetration in the country at 88%, in 2021-22, significantly higher than the historical sector average of 51.4% (over the period from 2011-12 to 2021-22), which is the rate funded through the cost allowances provided by the econometric models (see Appendix 2).

Our non-household meters are also reaching the end of their useful life by the end of AMP8 and will need replacing.

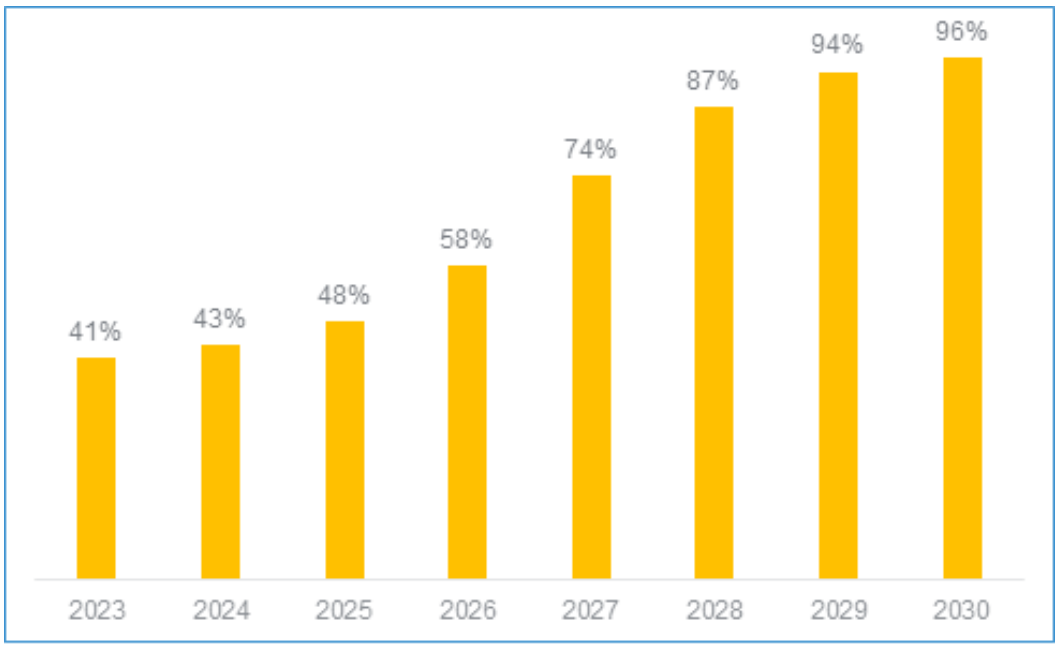
We have an atypical need to replace all meters this AMP due to our rapid roll out during AMP5, which was far earlier than industry average. Beyond AMP9 replacement rates for other companies will rise, reflecting a larger number of meters reaching obsolescence across WASCs, raising the overall allowance for meter replacement. This will bring Southern's meter replacement costs into line with the allowance, meaning that additional CAC funding will not be required by Southern again to replace meters.

1.2. Management Control

Being in a water stressed area is outside management control and the actions that need consideration are prescribed through government guidance and the WRMP process. We made the early proactive decision to undertake the universal metering programme in AMP5 (2010-15) to ensure a resilient water supply to our customers. The programme succeeded in reducing water demand, helped customers understand their consumption, and allowed us to identify and repair ageing supply pipes to reduce leakage rates. The universal metering programme has been an overwhelming success. It has helped reduce water consumption by 16%[3], with an average household saving of almost 70 litres per day[3].

96% of our household meters will be 15 years old at the end of AMP8 (Figure 2). So we are now in the position that we must replace all of our household meters by 2030.

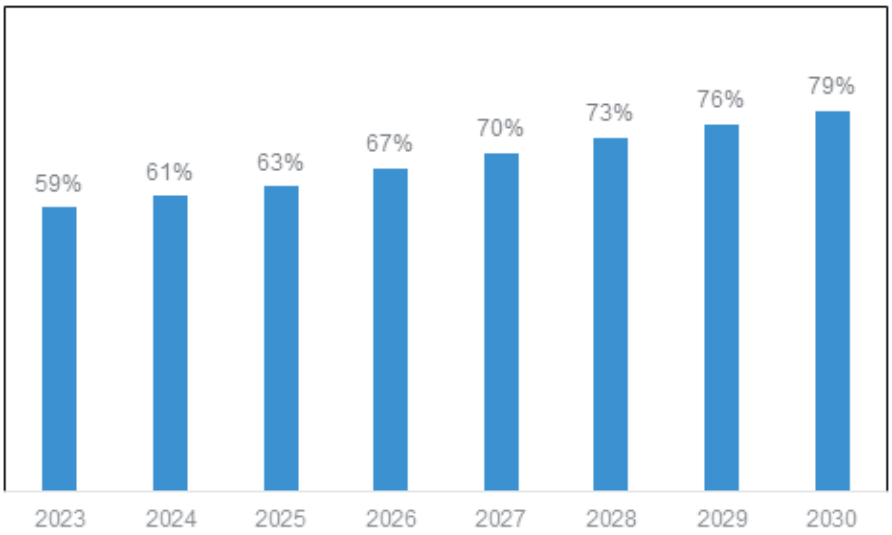
Figure 2: Southern Water household meters over 15 years old by year



Source: Southern Water asset register

Of our non-household meters, 79% will be 15 years old at the end of AMP8 (Figure 3).

Figure 3: Southern Water non-household meters over 15 years old by year



Source: Southern Water asset register

Replacing all our meters and upgrading to smart meters in a single AMP period will allow us to benefit from synergies in procurement and efficient delivery. This claim does not include the uplift costs for replacing our existing meters with smart technology. This requirement is necessary to maintain the level of water efficiency performance experienced by customers and ensure our statutory duty to maintain accuracy of meters. This is outside management control.

1.3. Materiality of Claim

The claim is material. Ofwat's models provide for industry average annual replacement rates at 3.4% for household meters and 3.3% for non-household meters (see Appendix 2).

This gives total implicit cost allowance of £22.803m and a total net value of the claim of £88.782 (see section 1.4). This is 4.11% of the projected business plan totex for water network plus (and is above the 1% threshold).

In AMP8, we will be replacing our meters with smart metering technology to better manage our network and meet the water efficiency and leakage goals within our water resources management plan. The total investment cost of our meter replacement programme is £175m for AMP8. This includes the cost for replacement in AMP8 and the enhanced functionality of smart meters, which is required to deliver the water efficiency targets in our Water Resources Management Plan.

This cost adjustment claim is only for the efficient cost of replacing existing meters like-for-like across a much larger and older base of existing meters than the industry average.

The claim does not include the uplift costs for replacing existing meters with smart technology, which is included in our PR24 business plan as an enhancement case (SRN28 Water Resources – Smart Metering).

1.4. What are the adjustments to the allowances?

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 (see Appendix 2). Ofwat's models provide an allowance for this replacement rate, which would be sufficient for a company operating at the industry average level of meter penetration (51.4%) and a gradual installation of meters over time. Neither of these assumptions is true for Southern Water.

For Southern Water, this equates to an implicit allowance of £22.803m. This has been derived by:

1. Calculating the number of meters expected to be replaced based on the industry average by multiplying the number of Southern Water households/business customers and the historical average meter penetration rate accounted for by the Ofwat models.
2. Multiplying the expected number of meters to be replaced by the industry average historical replacement rate to obtain the number of meters funded by the Ofwat models to be replaced per year.
3. Calculating the annual implicit allowance by multiplying the number of meters funded to be replaced each year by the efficient unit cost of meter replacement (see section 2).
4. Multiplying the annual implicit allowance by five years to obtain the implicit allowance over a 5-year AMP period.
5. Multiply the AMP8 implicit allowance by two to account for the past allowance received in AMP7 in which only essential meter replacement was undertaken.

Table 1 shows the calculations. Appendix 2 shows the penetration rates and industry average replacement rates used in the calculations.

At AMP7 our meter replacement activity has been minimal, with only essential meter replacement undertaken.

We fully understand that we have been funded for the average rate of meter replacement in AMP7 and would be funded again in AMP8 through modelled base costs. To account for this, we have calculated the implicit allowance associated with these fundings over the two AMPs (see step 5 above) and deducted it from the gross value of the claim. The calculation of implicit allowance over a two-AMP period removes any risk of double remuneration for the replacement of meters reaching obsolescence, while allowing the funding required to carry out critical replacements needed to retain compliance with statutory obligations.

Delivery over a single AMP period was a management decision to benefit from synergies of upgrading to smart meters and to maximise efficient procurement and delivery.

Table 1: Calculation of Implicit Allowance

Southern Water	Number	Industry average replacement Rate	No. Meters replaced per year	Unit Cost per meter (£)	Cost (£m) over a 5-year AMP period	Implicit allowance for AMP7 and AMP8 (£m)
Households						
No. Households	1,046,000					
No. meter replacements based on sector average meter penetration (51.4%)	537,000					
Implicit Allowance - Households	**537,000**	**3.4%**	**18,500**	**£105.80**	**£9.787m**	**£19.573m**
Non-Households						
No. of business properties	48,908					
No. meter replacements based on sector average meter penetration (90.7%)	44,360					
Implicit Allowance – Non-Households	**44,360**	**3.3%**	**1,464**	**£220.67**	**£1.615m**	**£3.230m**
Total implicit allowance – Households and non-households						**£22.803m**

An alternative implicit allowance has been calculated based on the upper quartile unit cost of meter replacement, £71.38 for household meters and £63.61 for non-household meters (see section 2 for explanation of our approach to unit cost calculation and Appendix 3 for the results). Based upon the methodology above, this would provide an alternative implicit allowance of £13.205m for household meters and £0.936m for non-household meters.

Based on the age of our meters, we need to replace all of our meters over AMP8, which requires a 20% replacement rate per annum. This equates to a required cost allowance of £111.585 in the five years of AMP8, before deducting the implicit allowance. This is derived by:

1. Multiplying the number of existing meters by the efficient unit cost of meter replacement.

Table 2 shows the calculations.

Table 2: Calculation of Cost Adjustment Claim

Southern Water	Number			Unit Cost per meter (£)	Cost (£m) over AMP8
Households					
No. of existing meters	**948,797**			**£105.80**	**£100.382m**
Non-Households					
No. of existing meters	**50,766**			**£220.67**	**£11.203m**
Total gross cost of the claim – Households and non-households					**£111.585m**
Total net cost of the claim – Households and non-households					**£88.782m**

The cost allowance of £111.585m will fund the replacement of all our meters over the AMP8 period. Deducting the implicit allowance of £22.803m, a cost adjustment of £88.782 is necessary to allow like-for-like replacement of our meter assets in AMP8.

1.5. Symmetrical Adjustment

We have not estimated the symmetrical adjustment for this claim because we do not have information on the age profile of the meters for other companies to derive the replacement rates for each company in AMP8.

We do not anticipate a symmetrical adjustment to be significant for most companies. Southern Water is unique in facing a funding shortfall because only Southern has a high meter penetration rate combined with old meters that need replacement. Other companies either have a significantly lower meter penetration rate or, if they have a high penetration rate, it is due to recent metering programmes meaning that their meters are not yet due to be replaced.

2. Cost Efficient

Due to the upcoming obsolescence of a large proportion of meters we installed in AMP5, we face a need to replace all meters during AMP8. We provide robust modelled cost estimates based on industry-wide meter replacement costs drawn from sector-wide Annual Performance Review (APR) reporting.

For the purposes of this claim, we have used the industry meter replacement outturn data reported in the APR 2020-21 and 2021-22 data tables to calculate an efficient unit cost estimate[4]. We have averaged the meter replacement unit cost for basic and AMR meters for each company over the two years for which data are available (2020-21 and 2021-22) and used the sector median as an efficient unit cost.

We have used the median, rather than the upper quartile, due to the wide range of unit costs across the industry. For households, the unit cost ranges from a minimum of £54.00 and a maximum of £454.13. For non-household meters, the range is £32.32 to £665.35. The wide range of unit costs is indicative of lower data reliability in light of which it is appropriate to use a more robust benchmark (the median is more robust than the upper quartile).

This has provided an efficient cost estimate for like-for-like meter replacement of £105.80 per household meter and £220.67 per non-household meter in 2022-23 prices.

Appendix 1 shows the calculation of meter replacement unit rates for household and non-household meters.

For the avoidance of doubt, this claim refers to the cost of replacing existing meters like-for-like, but across a much larger and older base of existing meters than the industry average. It does not include the uplift costs for replacing our existing meters with smart technology, which is a separate enhancement expenditure case in our business plan submission (SRN28 Water Resources – Smart Metering). The smart metering programme is dependent upon the funding secured through this claim.

3. Need for Investment

96% of our household and 79% of our non-household meters will be 15 years old at the end of AMP8 (see Charts 2 & 3). The meters will have reached the end of their expected life and will need to be replaced.[5] We need to replace these meters to continue our ability to accurately measure consumption and ensure we are compliant with statutory obligations. Any significant under-registration of meters would be in breach of our statutory obligation to maintain meters to a prescribed level of accuracy.[6]

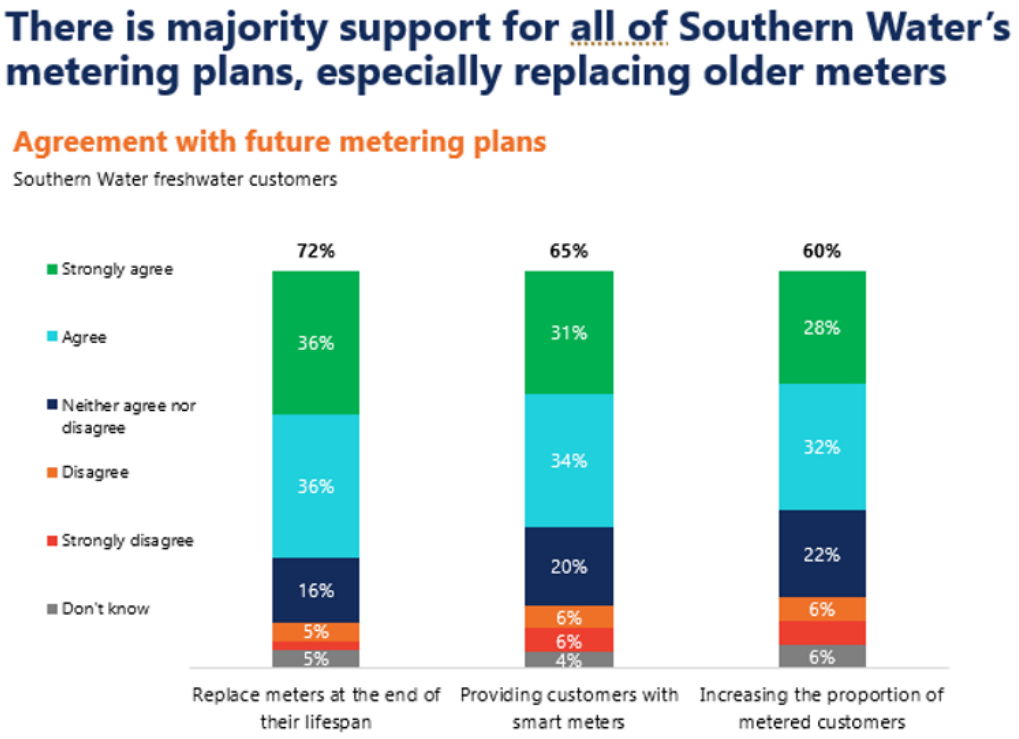
This would result in significant issues, namely:

- Impact our water efficiency and leakage performance which is a key part of our Water Resources Management Plan.
- Impact the accuracy of our customer charging.
- Create unfairness in charging where some customer meters under-registered actual volumes consumed.
- Distort incentives to use water wisely.

Our customer research (see Figure 4) shows that 72% of our customers either strongly agree or agree that meters should be replaced at the end of their lifespan. There are limited concerns around the replacement of meters from some customers who asked to be informed ahead of changes.

Customers also support an increase in the proportion of metered customers with 60% either agreeing or strongly agreeing with this statement. It is felt that metering provides customers with a fairer pricing system and greater control of their bills – both of which are welcomed.

Figure 4: Results from customer engagement on our metering programme



Source: Smart Metering Quant, 376 freshwater customers across the Southern Water region, August '22[7]

4. Best Option for Customers

Our smart metering programme will replace all meters over the AMP8 period when the meters reach the end of their 15-year useful life. This replacement is a statutory requirement, which cannot be deferred or reduced in scope without compromising our compliance with statutory obligations. The upgrading of meters to smart technology will further reduce customer water usage and improve targeting of leakage reduction activity and is key to our Water Resource Management Plan.

As part of our assessment of the best value option, we have considered a wide range of options which vary in scale and timing of the rollout. These include:

- **Option 1: 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 2: Replace existing meters on fail with AMI technology (shortlisted)**. This option is the same as Option 1, 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 1, although these benefits would not be realised until all existing meters have failed and been replaced with AMI meters.
- **Option 3: Proactively replace existing meters with AMI technology in AMP8 (shortlisted)**. This option would proactively replace existing household and non-household VMR and AMR meters with smart AMI meters in AMP8. 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 4: 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 3, 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 5: Proactively replace existing meters with AMI technology in AMP8 and AMP9 (shortlisted).** This option is equivalent to Option 3, 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.

- **Option 6: 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 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 7: 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.

Our best value option for customers is the proactive rollout of smart meters across all our Water Resource Zones (Option 3). 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. Further detail behind these figures can be found in the Enhancement Business Case for Smart Metering (SRN28 Water Resources – Smart Metering).

Table 3: Assessment of Best Value Option

Option	Description	AMP8 cost	NPV	BCR	Comment
1	Replace existing meters on fail with AMR technology (baseline)	£124.3m	-	-	Baseline against which other options assessed
2	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
3	**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**
4	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
5	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

The cost-benefit analysis in this meter replacement cost adjustment claim and the smart metering enhancement case (SRN28 Water Resources – Smart Metering Enhancement Business Case) 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 cost adjustment claim and the enhancement case, 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 cost adjustment claim and smart metering programme enhancement case.

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.

The size of the overall investment programme is larger than we will receive via the existing regulatory framework. We are therefore looking at alternative delivery routes that will enable the investment to continue, while providing value for money for customers, as detailed in SRN17: Alternative Delivery Technical Annex.

We have begun work to identify delivery routes where the installation, maintenance, data collection and processing are fully outsourced to an alternative provider, with that provider owning the meters and Southern Water buying data and other services. This possibility has been mentioned to Ofwat in our DPC meeting of 3 April 2023, our first PR24 engagement meeting with Ofwat on 26 April 2023 and at our chief exec meeting with Ofwat on 15 May 2023. Ofwat has said in written feedback on the meeting of 3 April it is open to considering smart meters as candidates for the formal DPC process.

We will continue to engage with Ofwat and, in the event that either the DPC or the alternative financing route is recommended, we will adjust this claim to take account of the intended delivery mechanism.

5. Customer Protection

We are undertaking a smart meter replacement programme which is key to our Water Resource Management Plan. This claim refers to the cost of replacing existing meters like-for-like which is a key enabler of our smart metering programme. The uplift costs for replacing existing meters with smart technology, is included in our PR24 business plan as an enhancement case (SRN28 Water Resources – Smart Metering Enhancement Business Case).

Smart metering is 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. Since we have submitted our claim in June 2023, we have assessed the benefits of our smart metering programme and we believe that the benefits provide sufficiently strong incentives for us to complete the smart meter rollout as planned through the impacts on these PCs. We have, therefore, removed our proposed PCD from this claim as we consider that customers are already sufficiently protected through performance commitments. Please see our Methodologies for Performance Commitments Technical Annex for details on quantification of PC benefits from smart metering.

References

[1] Environment Agency, Water stressed areas – final classification 2021, July 2021. (Link)
[2] Defra, Request for Information: Compulsory Fitting of Water by Southern Water, July 2013. (Link)
[3] University of Southampton, 2015, https://www.southampton.ac.uk/news/2015/02/fitting-water-meters.page
[4] Ofwat, PR24 Cost Assessment Master Dataset, Wholesale Water Base Costs v4, April 2023
[5] Southern Water, Draft Water Resources Management Plan 2024, Annex 16: Smart Metering, October 2022. (Link)
[6] The Measuring Equipment (Cold-water Meters) Regulations 1988. (Link)
[7] Southern Water, Smart Metering Quant, 376 freshwater customers across the Southern Water region, Aug 2022

Appendix

A 1	Calculation of the meter replacement unit cost - basic and AMR meters
A.2	Meter penetration rate by year
A 3	Alternative implicit allowance based on upper quartile unit cost

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Appendix 1 – Calculation of the meter replacement unit cost – basic and AMR meters

Table 4: Household meters unit costs

Price base:2022/23	Meter Replacement Expenditure (£)			Total Household Meter Replacement (no.)			Cost per unit (£/Meter)		
	2021	2022	Total	2021	2022	Total	2021	2022	Total
Anglian Water	£5,977,011	£13,432,356	**£19,409,367**	43,162	143,334	**186,496**	£138.48	£93.71	**£104.07**
Northumbrian Water	£245,708	£414,223	**£659,931**	2,569	2,481	**5,050**	£95.64	£166.96	**£130.68**
United Utilities	£0	£3,604,068	**£3,604,068**	2	10,995	**10,997**	£0.00	£327.79	**£327.73**
Southern Water	£0	£2,695,169	**£2,695,169**	0	7,360	**7,360**		£366.19	**£366.19**
South West Water	£0	£1,015,445	**£1,015,445**	0	2,236	**2,236**		£454.13	**£454.13**
Thames Water	£1,127	£709,266	**£710,393**	8	6,672	**6,680**	£140.89	£106.30	**£106.35**
Dŵr Cymru	£897,172	£1,091,549	**£1,988,720**	4,702	5,005	**9,707**	£190.81	£218.09	**£204.87**
Wessex Water	£675,133	£1,138,309	**£1,813,442**	3,688	21,802	**25,490**	£183.06	£52.21	**£71.14**
Yorkshire Water	£0	£1,051,800	**£1,051,800**	2	2,568	**2,570**	£0.00	£409.58	**£409.26**
Affinity Water	£0	£0	**£0**	0	11,585	**11,585**	n/a	n/a	**n/a**
Bristol Water	£181,463	£210,917	**£392,380**	1,680	2,048	**3,728**	£108.01	£102.99	**£105.25**
Portsmouth Water	£41,703	£43,488	**£85,191**	964	218	**1,182**	£43.26	£199.49	**£72.07**
SES Water	£584,965	£524,139	**£1,109,104**	10,287	9,206	**19,493**	£56.86	£56.93	**£56.90**
South East Water	£0	£649,058	**£649,058**	0	7,129	**7,129**		£91.04	**£91.04**
South Staffs Water	£0	£758,866	**£758,866**	0	2,231	**2,231**		£340.15	**£340.15**
Severn Trent Water	£75,516	£8,040,931	**£8,116,447**	785	128,130	**128,915**	£96.20	£62.76	**£62.96**
Hafren Dyfrdwy	£2,254	£146,772	**£149,026**	19	2,741	**2,760**	£118.64	£53.55	**£54.00**
						Upper Quartile	£46.66	£69.83	£71.38
						Median	£113.33	£136.63	**£105.80**

Source: Southern Water analysis of industry data collected through the Annual Performance Report (APR) data tables for 2020-21 and 2021-22, table 6D, lines 4 and 9 (residential meters renewed). Note: expenditure figures are converted into the 2022/23 price base.

Table 5: Non-household meters unit costs

Price base:2022/23	Meter Replacement Expenditure (£)			Total Non-Household Meter Replacement (no.)			Cost per unit (£/Meter)		
	2021	2022	Total	2021	2022	Total	2021	2022	Total
Anglian Water	£1,168,676	£1,332,907	**£2,500,583**	4,067	5,230	**9,297**	£287.11	£252.86	**£268.97**
Northumbrian Water	£154,413	£128,290	**£282,702**	504	719	**1,223**	£306.37	£178.43	**£231.15**
United Utilities	£0	£1,249,519	**£1,249,519**	1	1,877	**1,878**	£0.00	£665.70	**£665.35**
Southern Water	£0	£90,238	**£90,238**	0	248	**248**	-	£363.86	**£363.86**
South West Water	£0	£259,841	**£259,841**	0	573	**573**	-	£453.47	**£453.47**
Thames Water	£67,626	£619,596	**£687,222**	156	1,206	**1,362**	£433.50	£513.76	**£504.57**
Dŵr Cymru	£526,356	£940,429	**£1,466,784**	1,104	1,382	**2,486**	£476.77	£680.48	**£590.02**
Wessex Water	£170,192	£234,051	**£404,243**	697	1,624	**2,321**	£244.18	£144.12	**£174.17**
Yorkshire Water	£32,686	£332,148	**£364,833**	178	811	**989**	£183.63	£409.55	**£368.89**
Affinity Water	£0	£0	**£0**	2	948	**950**	n/a	n/a	**n/a**
Bristol Water	£56,355	£54,360	**£110,715**	519	540	**1,059**	£108.58	£100.67	**£104.55**
Portsmouth Water	£9,017	£0	**£9,017**	279	0	**279**	£32.32	-	**£32.32**
SES Water	£30,432	£10,655	**£41,086**	544	196	**740**	£55.94	£54.36	**£55.52**
South East Water	£0	£92,412	**£92,412**	0	1,446	**1,446**	-	£63.91	**£63.91**
South Staffs Water	£0	£252,230	**£252,230**	0	1,200	**1,200**	-	£210.19	**£210.19**
Severn Trent Water	£1,127	£158,731	**£159,858**	0	2,525	**2,525**	-	£62.86	**£63.31**
Hafren Dyfrdwy	£0	£2,174	**£2,174**	0	34	**34**	-	£63.95	**£63.95**
						Upper Quartile	£32.32	£63.92	**£63.94**
						Median	£213.90	£210.19	**£220.67**

Source: Southern Water analysis of industry data collected through the Annual Performance Report (APR) data tables for 2020-21 and 2021-22, table 6D, lines 4 and 9 (residential meters renewed). Note: expenditure figures are converted into the 2022/23 price base.

Appendix 2 – Meter penetration rate by year

Table 6: Household penetration rates

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average
Average industry % replaced	3.8%	4.5%	4.2%	3.7%	3.5%	3.7%	2.7%	2.2%	2.2%	2.1%	3.8%	**3.4%**
SRN % metered	48%	59%	71%	80%	85%	87%	87%	87%	88%	88%	88%	
Industry % metered	42%	44%	47%	49%	51%	51%	53%	55%	57%	58%	59%	**51.4%**

Source: Southern Water analysis of industry data collected through the Annual Performance Report (APR) data tables for 2020-21 and 2021-22 from table 6D and table 4R. The average industry replacement rate is calculated as the number of meters replaced divided by the number of metered households.

Table 7: Non-household penetration rates

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average
Average industry % replaced	3.7%	4.3%	4.0%	3.7%	3.1%	2.6%	1.4%	1.7%	2.3%	2.3%	2.8%	**3.3%**
SRN % metered	64%	90%	92%	91%	91%	92%	92%	92%	93%	92%	93%	
Industry % metered	89%	90%	90%	91%	91%	91%	91%	91%	91%	91%	91%	**90.7%**

Source: Southern Water analysis of industry data collected through the Annual Performance Report (APR) data tables for 2020-21 and 2021-22 from table 6D and table 4R. The average industry replacement rate is calculated as the number of meters replaced divided by the number of metered non-households.

Appendix 3 – Alternative implicit allowance based on upper quartile unit cost

Table 8: Calculation of Alternative Implicit Allowance using upper quartile unit cost

Southern Water	Number	Industry average replacement Rate	No. Meters replaced per year	Upper Quartile unit cost per meter (£)	Cost (£m) over a 5-year AMP period	Implicit allowance for AMP7 and AMP8 (£m)
Households						
No. Households	1,046,000					
No. meter replacements based on sector average meter penetration (51.4%)	537,000					
Implicit Allowance - Households	**537,000**	**3.4%**	**18,500**	**£71.38**	**£6.602**	**£13.205**
Non-Households						
No. of business properties	48,908					
No. meter replacements based on sector average meter penetration (90.7%)	44,360					
Implicit Allowance – Non-Households	**44,360**	**3.3%**	**1,464**	**£63.94**	**£0.468**	**£0.936**