

Meter Replacement Cost Adjustment Claim

09/06/23

June 2023



from
**Southern
Water** 

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	£114m
Total implicit value of claim for AMP8	£23m
Total net value of claim for AMP8	£91m
Materiality for relevant price controls	£20m
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:

- Our early adoption of universal metering, as compared to the rest of the industry. The age profile of our meters means that 94% of our household meters (see Chart 1) and 79% of our non-household meters (Chart 2) 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.
- 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. 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 (94% 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 4.5% 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	For the delivery costs of our AMP8 base metering programme we propose meter replacement Price Control Deliverables (PCDs), based on the household and non-household meter replacement rates delivered.

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 2007¹ 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.

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.

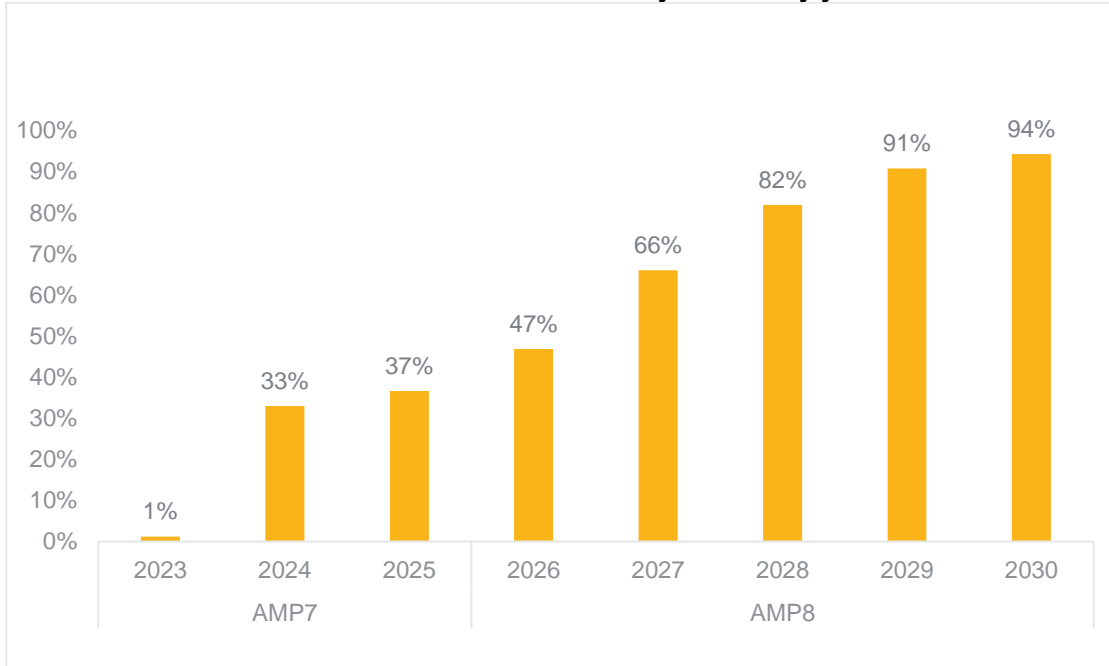
1.2 Management Control

Being in a water stressed area is outside management control and the actions needed to be considered 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) across 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 day³.

About 94% of our household meters will be 15 years old at the end of AMP8 (Chart 1). So we are now in the position that we must replace all of our household meters by 2030.

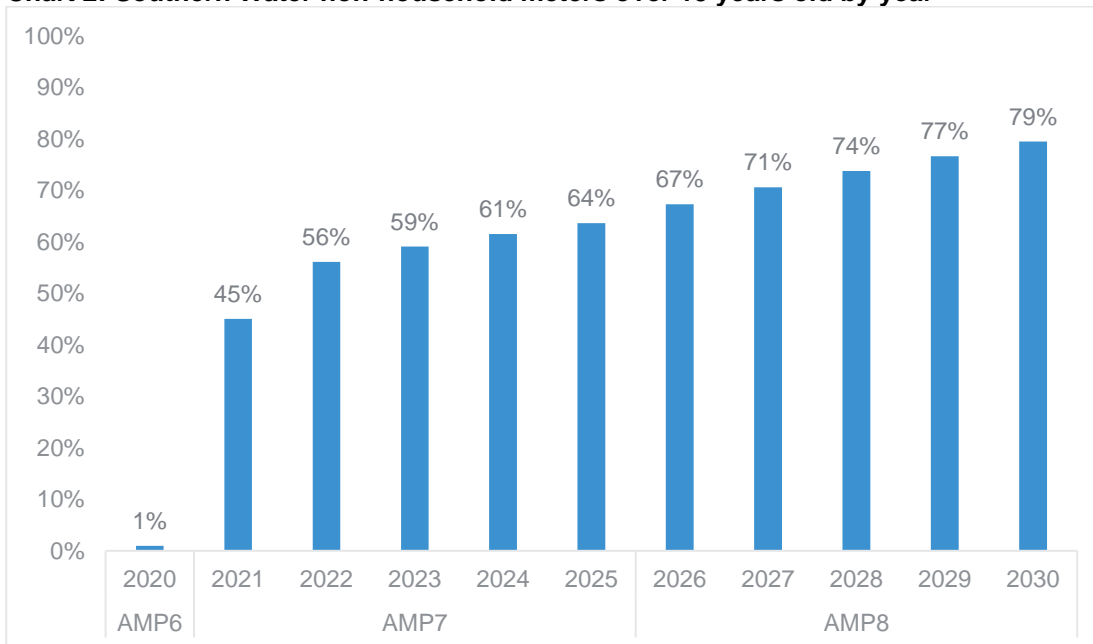
Chart 1: Southern Water household meters over 15 years old by year



Source: Southern Water asset register

Of our non-household meters, 79% will be 15 years old at the end of AMP8 (Chart 2).

Chart 2: Southern Water non-household meters over 15 years old by year



Source: Southern Water asset register

We are replacing all our meters and upgrading to smart meters in a single AMP period 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 £90.721m (see section 1.4). This is 4.5% 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 £188m, as indicated in our draft Water Resource Management plan⁶. 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 will be included in our PR24 business plan as an enhancement case.

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.

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 £113.525m in the five years of AMP8, before deducting the implicit allowance. This is derived by:

1. Multiplying the number of existing meters by the replacement rate of 20%
2. Multiplying the number of meters required to be replaced each year by the efficient unit cost of meter replacement.

Table 2 shows the calculations.

Table 2: Calculation of Cost Adjustment Claim

Southern Water	Number	Replacement Rate	No. Meters replaced per year	Unit Cost per meter (£)	Cost (£m) over AMP8
Households					
No. of existing meters	963,722	20%	192,744	£105.80	£101.962m
Non-Households					
No. of existing meters	52,399	20%	10,480	£220.67	£11.563m
Total gross cost of the claim – Households and non-households					£113.525m
Total net cost of the claim – Households and non-households					£90.721m

The cost allowance of £113.525m will fund the replacement of all our meters over the AMP8 period. Deducting the implicit allowance of £22.803m, a cost adjustment of £90.721m 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

For the purposes of this claim, we have used the industry meter replacement outturn data reported in the Annual Performance Review (APR) 2020-21 and 2021-22 data tables to calculate an efficient unit cost estimate⁴. 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 our business plan submission we will enhance the robustness of our non-household meter unit rates through benchmarking with standardised prices from the business retail market.

3. Need for Investment

About 94% of our household and 79% of our non-household meters will be 15 years old at the end of AMP8 (see Charts 1 & 2). The meters will have reached the end of their expected life and will need to be replaced.⁶ We need to replace these meters 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.⁷

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 Chart 3) 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.

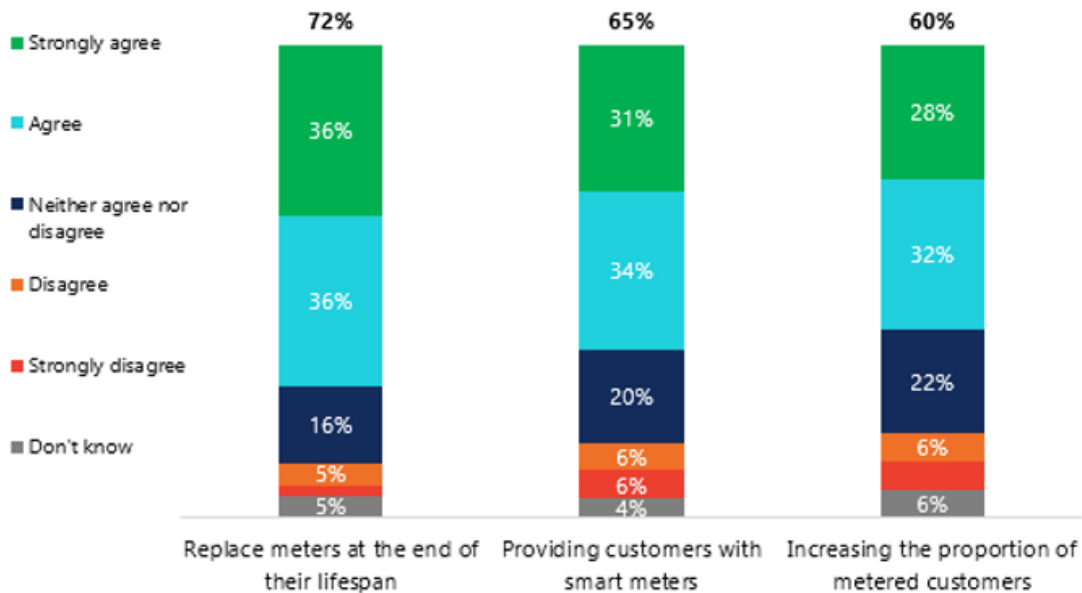
Customers also support an increase in the proportion of metered customers with 60% either agreeing or strongly agreeing with this statement. It is felt that metering provides customers with a fairer pricing system and greater control of their bills – both of which are welcomed.

Chart 3: Results from customer engagement on our metering programme

There is majority support for all of Southern Water’s metering plans, especially replacing older meters

Agreement with future metering plans

Southern Water freshwater customers



Source: Smart Metering Quant, 376 freshwater customers across the Southern Water region, August '22⁵

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.

The upgrading of meters to smart technology will further reduce customer water usage and improve targeting of leakage reduction activity. This is key to our Water Resource Management Plan.



The smart metering programme is dependent upon this cost claim. This cost adjustment refers to the cost of replacing existing meters like-for-like across a much larger and older base of existing meters than the industry average. This claim does not include the uplift costs for replacing our meters with smart technology which we are submitting as an enhancement case. Because this claim is a key enabler of our smart metering programme, we considered the following three options for appraisal:

- Option 1: Replace on fail with AMR meters over 15 years
- Option 2: Replace on fail with AMI meters over 15 years
- Option 3: Proactive smart metering roll-out over 5 years (AMP8)

We are developing a 4th option for a proactive smart metering roll-out over 10 years, following feedback from Ofwat on our draft Water Resource Management Plan. We plan to include this 4th option in our business plan submission.

A ‘Do nothing’ option is not considered because the current meters are failing and reaching the end of their useful life and will need to be replaced.

The table below summarises each option’s pros and cons against their cost effectiveness, types of benefits, deliverability and customer experience.

Table 3 – Options considered for meter replacement

	1 Replace on fail with AMR Meters	2 Replace on fail with AMI Meters	3 Proactive Smart AMI Metering
Option	<ul style="list-style-type: none"> • Reactively replace existing Dumb and AMR meters with new AMR meters when they mechanically fail (likely across AMP8-10) 	<ul style="list-style-type: none"> • Reactively replace existing dumb and AMR meters with new AMI solution when they mechanically fail (likely across AMP8-10) 	<ul style="list-style-type: none"> • Proactively replace existing dumb and AMR meters with new AMI solution within AMP8
Solution	<ul style="list-style-type: none"> • <i>Automated Meter Reading (AMR) meters are read by a vehicle as it drives twice per year to provide retrospective monthly reads</i> 	<ul style="list-style-type: none"> • AMI = Advanced metering infrastructure connects meters to a communication network like a mobile phone. • Meter reads typically recorded hourly and communicated daily • Combined with new capabilities to provide insight and advice to customers 	
Pros	<ul style="list-style-type: none"> • Less investment needed in comms network and insight capabilities (although meter and install costs similar to 2) 	<ul style="list-style-type: none"> • Costs are spread out over a longer period than 3 (albeit failure rates are increasing with age) 	<ul style="list-style-type: none"> • Customers receive benefits of Smart more quickly • Efficiencies & CMEX benefits of street by street roll out • The fastest route to provide a consistently high level of CX.
Cons	<ul style="list-style-type: none"> • Delivers none of the benefits of smart, but still very costly as meters still replaced 	<ul style="list-style-type: none"> • Less efficient than a street-by-street roll-out per 3 • Some customers will not receive smart benefits for many years, therefore, leading to disparity on how customers are treated. • Not cost effective. 	<ul style="list-style-type: none"> • Costs incurred within AMP8, which may put some pressure on prices depending on how funded

Source: Southern Water draft WRMP, Annex 16 - Smart Metering, October 2022. ([Link](#))

The table below summarises the cost-benefit analysis of the three options developed. The options appraisal shows that:

- There is no incremental water-saving benefit of like-for-like replacement (option 1).
- The smart metering roll-out (option 3) has the best cost-benefit net position despite costing about the same as like-for-like replacement. This is because the smart metering option (option 3) delivers £122m of water-savings benefits which the like-for-like replacement option (option 2) does not deliver.

- Hourly data (via Smart Enhancement Case) is needed to drive the water saving benefits of £122m or 17.43ML/d of saving in per capita consumption and customer side leakage, as we explain in our draft WRMP.⁶
- However, this benefit could be significantly delayed if Ofwat do not grant the funding for replacements in AMP8 that we are claiming.

The cost-benefit of the 4th option in development (smart meter roll-out over 10 years) will be added in our business plan submission.

Table 4 – Options appraisal – Cost-Benefit analysis

	AMP7 (£m)	AMP8 (£m)	AMP9 (£m)	AMP10 (£m)	Total (£m)
Option 1 – Replace on fail with AMR meters					
Costs	11.3*	103.6	72.2	-2.1	185.0
Benefits	-	-	-	-	-
Net Position	(11.3)	(103.6)	(72.2)	2.1	(185.0)
Option 2 – Replace on fail with AMI meters					
Costs	11.3*	107.8	81.9	13.9	215.9
Benefits	-	41.9	63.5	19.6	124.9
Net Position	(11.3)	(66.0)	(18.4)	5.6	(90.1)
Option 3 – Proactive Smart Metering					
Costs	11.3*	161.4	10.4	5.4	188.5
Benefits	-	87.7	17.4	17.4	122.4
Net Position	(11.3)	(73.8)	(7.0)	(12.0)	(66.1)

* Note: The £11.3m spend for AMP7 is made up of £10.2m for Programme and £1.1m of BAU costs

Source: Southern Water draft WRMP, Annex 16 - Smart Metering, October 2022. ([Link](#))

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.

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

For the delivery costs of our AMP8 base metering programme we propose two meter replacement Price Control Deliverables (PCDs), based on the meter replacement rate for household and non-household meters. Where the meter replacement rate does not progress as funded in AMP8, the costs of the meters not replaced are returned to customers at PR29.

Table 5 and 6 below set out the derivation of the proposed unit rate for these adjustments.

Table 5 – Household: Meter Replacement Price Control Deliverable

Component	Output
Output	963,722 meters delivered
Total cost (net claim)	£82.389m
Unit rate	£85.49 per meter. (total cost/total meters replaced)
Penalty rate (before totex cost sharing rate)	£85.49 per unit
Penalty rate (assuming a totex cost sharing rate of 50%)	£42.75 per unit
Scheme Delivery Date	31st March 2030
Gated dates (if required)	N/A

Table 6 – Non-Household: Meter Replacement Price Control Deliverable

Component	Output
Output	52,399 meters delivered
Total cost (net claim)	£8.333m
Unit rate	£159.02 per meter. (total cost/total meters replaced)
Penalty rate (before totex cost sharing rate)	£159.02 per unit
Penalty rate (assuming a totex cost sharing rate of 50%)	£79.51 per unit
Scheme Delivery Date	31st March 2030
Gated dates (if required)	N/A

No late penalty is applicable.

The provision of meter replacement will be subject to specific third-party assurance.

For every meter not replaced, we will return £42.75 for household meters and £79.51 for non-household meters to customers via an RCV adjustment at PR29, assuming a totex cost sharing rate of 50%.

This PCD will just cover the cost of like-for-like replacement of our meters. Any smart metering or smart metering infrastructure required is over and above this PCD and customer protections will be set out as required for these in our enhancement case.

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, Smart Metering Quant, 376 freshwater customers across the Southern Water region, Aug 2022
- ⁶ Southern Water, Draft Water Resources Management Plan 2024, Annex 16: Smart Metering, October 2022. ([Link](#))
- ⁷ The Measuring Equipment (Cold-water Meters) Regulations 1988. ([Link](#))

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

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

Table A1.1: 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.

Cost Adjustment Claim

Meter Replacement

Table A1.2: 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 A2.1: 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 A2.2: 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 A3.1: 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