PR24

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A3-22 WRMP NHH DEMAND

NES36

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1. INTRODUCTION

This business case for non-household (NHH) metering and water efficiency should be read in conjunction with our **Demand Management case** (NES15). In combination with our Supply Options programme, covered in our **WRMP Supplies enhancement business case** (NES14), these components deliver our overall WRMP24 objectives for AMP8. In this case we outline our plans for expenditure in NHH metering and water efficiency activities. Our NHH metering programme includes enhancement elements equivalent to those for household (HH) metering described in **NES15**:

- New NHH meter programme: expanding our smart meter coverage to previously unmetered non-household customers through compulsory metering.
- Replacement NHH meter programme: enhancing our smart network via the addition of a smart-reader unit as part of our meter replacement programme (enhancement claim only for the unit-cost of the smart reader component).
- Indirect costs: enhancement costs linked to expansion of NHH meter coverage but not included in the unit cost rate for metering.

We have identified NHH Water Efficiency activities through our WRMP process, linked to our NHH smart metering programme. Not only do these activities contribute to our overall WRMP programme, they ensure we meet our obligations in line with the new Business Demand performance commitment introduced by Ofwat for PR24.

We have two **Water Resource Management Plans** (WRMP), one for each of our Northumbrian Water (in the North East), and Essex & Suffolk Water (in the East of England) areas. These plans are very different, because the North East has historically had large water supply surpluses (mostly due to Kielder and other reservoirs), while Essex and Suffolk are classified as seriously water stressed areas. As a result, Essex and Suffolk has very low levels of leakage and a higher proportion of smart water meters compared to the North East.

Through our statutory Water Resources Management Planning process, we have identified a material water supply deficit in our Suffolk region and therefore a need to improve our water supply resilience in our Essex and Suffolk Water (ESW) area. The key factors driving this need are reductions in the amount of water we are permitted to abstract from rivers (as recently applied by the Environment Agency) and the impact of climate change on levels of rainfall and groundwater recharge – both of which mean substantial changes from the WRMP we set in 2019. While our WRMP modelling does not predict a water supply deficit in our Northumbrian area (NW), we remain vigilant and committed to ensuring water supply resilience across this region.

We also remain committed to our long-term objective to reduce per capita consumption (PCC) for HH customers within our supply areas to 110 litres/person/day by 2050. Therefore, our 2025-30 target is to reduce household PCC by 9.7% by 2029/30, compared to 2019/20 levels consistent with achieving this long-term objective. We plan to achieve HH PCC and NHH usage through improving the collection of water consumption data with targeted and effective metering for both

household (HH) and non-household (NHH) metering and through implementing initiatives to encourage our customers to use water more efficiently.

We are also mindful of a new long-term water demand target proposed by the UK Government, that underwent consultation in 2022, and will shape our future demand management efforts alongside our 2050 leakage and PCC targets. The Government has proposed a new target for a 20% reduction in distribution input per head of population by 2038 from a 2019/20 baseline which our WRMP also seeks to address.

In addition to our new long-term water demand target, **an independent research report** published by MOSL recommends that water companies planning to roll out smart meters for domestic customers should include non-household customers at the same time. MOSL expects companies to propose investment in enhanced metering technology for non-household customers, supported by additional water efficiency activities for non-household customers. Their **interim metering strategy** (April 2023) notes that MOSL were disappointed that draft WRMPs made little or no reference to the NHH market – but they are pleased that some companies have since announced their intention to include much more ambitious plans for PR24, including large-scale smart metering. MOSL recommend the adoption of an accelerated approach to smart metering for NHHs in AMP8.

We want to align with MOSL's final metering strategy and would welcome discussions with Ofwat about how to adjust this case to match with the final strategy in 2024, as this is completed.

1.1. BEST VALUE PLAN FOR DEMAND MANAGEMENT

We worked with regional stakeholders and neighbouring water companies to identify the best options to include in our WRMP24. We considered what risk could be offset by using demand management, before seeking to develop supply-side options. Our planning approach used least-cost optimisation as well as broader 'best value' decision making criteria to develop a 'Best Value Plan' for **WRMP24**, including:

- Cost to build and operate the plan.
- Adaptability and flexibility of the plan to cope with uncertain future needs.
- Alignment to the Water Resources North and Water Resources East regional strategies.
- Resilience of the plan to severe and extreme drought and other hazards, and the residual risks.
- Deliverability of the plan with timescales needed to manage risks.
- Alignment to customer preferences.
- Environmental and social impacts of the plan, including net environmental benefit.

The preferred plan **from our WRMP** is our Best Value Plan for demand options in the North East and Essex and Suffolk areas, as shown in Table 1. This also includes leakage and HH metering and water efficiency which are covered in our Demand Management case (NES15).

TABLE 1: OUR WRMP PREFERRED PLAN FOR NW AND ESW AREAS

	Essex and Suffolk area	Northumbrian *area*
Leakage	40% reduction by 2050.	Active Leakage Control to reduce leakage by 55% by 2050.
Metering	Compulsory metering and proactive replacement programme to be fully smart by 2035	Compulsory metering and proactive replacement programme to be fully smart by 2035
Water Efficiency Programme	In home interventions, digital engagement and activity related to smart metering, to reduce PCC to 110l/head/day by 2050. Interventions to reduce NHH business demand in line with the 9% Gov target	In home interventions, digital engagement and activity related to smart metering, to reduce PCC to 110l/head/day by 2050. Interventions to reduce NHH business demand in line with the 9% Gov target

1.2. SUMMARY OF COSTS

We will deliver our NHH demand management options through a combination of base maintenance and enhancement investment. We summarise the costs in Table 2 below, broken down by base and enhancement, type of high-level intervention, and region. **The total enhancement case is for £12.357m.**

TABLE 2: COST BREAKDOWN BY BASE AND ENHANCEMENT (TOTEX)

Region and Intervention Type	Base (£M)	Enhancement (£M)	Total (£M)
NHH Metering – new smart meters			
North (Northumbrian)	-	1.900	1.900
South (Essex and Suffolk)	-	0.953	0.953
NHH Metering – replacement			
North (Northumbrian)	5.025	0.901	5.926
South (Essex and Suffolk)	3.368	0.664	4.032
NHH Metering – indirect costs			
North (Northumbrian)	-	0.526	0.526
South (Essex and Suffolk)	-	0.481	0.481
NHH Water Efficiency			
North (Northumbrian)	-	5.215	5.215
South (Essex and Suffolk)	-	1.717	1.717
Total	**8.393**	**12.357**	**20.750**

The costs presented in Table 2 are slightly different to those in our WRMP, because the guidance for WRMP requires us to use historical unit costs whereas our enhancement costs use more efficient, forward-looking unit costs based on market testing and benchmarking. Some differences may be due to rounding.

2. NEED FOR ENHANCEMENT INVESTMENT

In this section, we describe the need for enhancement investment and present our evidence. We describe our evidence against each of the enhancement assessment criteria that Ofwat set out in A1.1 of **Appendix 9 – Setting Expenditure Allowances** with their PR24 methodology.

2.1. ALIGNMENT WITH STATUTORY PLANNING FRAMEWORKS

2.1.1 Our WRMP

We have developed our NHH metering programme and associated water efficiency activities targeting NHH customers as part of our WRMP submission. We are required by sections 37A to 37D of the **Water Industry Act 1991** to prepare and maintain a WRMP. The Government's **Water Resources Planning Guideline (WRPG)** (July 2022) then provides further guidance on how we should meet our obligation to prepare and maintain a WRMP, which must set out how we intend to achieve a secure supply of water for our customers and a protected and enhanced environment. We must prepare a WRMP every five years, review this annually, and this should forecast supply and demand over a minimum period of 25 years. They are expected to reflect regional plans to ensure a cohesive set of plans, unless there is clear justification for not doing so.

The WRPG states that in developing a WRMP in England and Wales, we should screen for a Strategic Environmental Assessment (SEA) or carry out a full SEA depending on the absence or presence of a supply demand deficit. Schedule 2 (6) confirms the following list of topics to be considered: biodiversity, flora and fauna, population and human health, soil, water, air, climatic factors, material assets, cultural heritage, and landscape. The SEA also considers the inter-relationship between these topics.

Our WRMP provides the evidence that our investments in leakage, metering, and water efficiency are required to achieve a secure supply of water for our customers and a protected and enhanced environment. The pace and scale of investments described in this enhancement case matches the preferred plan from our WRMP. These are statutory deliverables. Our WRMP provides the detailed evidence of how we have forecast our supply demand deficit and how much of this will need to be addressed through demand management.

The Government has set targets to reduce household demand to 110 l/p/d; reduce leakage by 50%; and reduce non-household water demand by 15% by 2050. Our investments in leakage, metering, and water efficiency – including the scale and timing of these investments – are needed to support the delivery of these long-term targets for Northumbrian Water as a whole.

2.1.2 NHH Water Efficiency

Before business retail separation in April 2017, our retail operations were integrated (that is, including both household and non-household activities together). As part of this, we delivered a small number of water efficiency interventions to support a reduction in NHH consumption. These tended to focus on 'domestic' type water use within NHH premises, such as school bathrooms, public conveniences, hotels, offices, and holiday parks.

For business retail separation **Ofwat set separate price controls** for household and non-household retail business units, and allocated NHH water efficiency into the new non-household retail control. Our non-household retail business was subsequently separated **from PR19** and moved to the (separate) retail business, **Wave**. This means that non-household water efficiency has not been included within our normal business operations at all since 2017 – and this is reflected in Ofwat's **most recent redetermination of the retail exit code**, which allocates water efficiency activities to retailers.

However, the retail water market set up for non-household water users has, despite clear progress with some customers, largely failed to deliver the positive water-saving outcomes envisaged[1] [2]. In turn, the Government in its Plan for Water[3] defined its target to reduce non-household water use by 9% by 31st March 2038. This target has been translated by Ofwat into the new Business Demand performance commitment.

MOSL's **interim metering strategy** for the non-household market recommends the adoption of an accelerated approach to smart metering in AMP8, before a national metering strategy is developed (in 2024). This interim strategy sets out the benefits for water companies to roll out enhanced metering technology to NHH customers and describes the support among business customers (82% would support smarter metering being rolled out). MOSL is "extremely keen to see a concerted effort towards smart meters in AMP8 so that they can begin contributing to achieving consumption reduction and efficiency targets as soon as possible and avoid the pitfalls of a protracted, piecemeal roll-out" (**interim metering strategy**, p7). The report calls on all companies to roll out advanced metering infrastructure (AMI) metering to NHH customers in AMP8.

MOSL recommends that water companies wishing to accelerate their smart metering programmes should seek enhancement funding in their PR24 submissions, principally on the basis of Defra's consumption reduction target.

Our programme for non-household metering and water efficiency activities in AMP8 is not only aligned to our WRMP process, but also critical to deliver our new regulatory obligations for NHH customers. We have aligned our approach with MOSL's recommendations.

[1] A joint Ofwat and Environment Agency open letter from Rachel Fletcher and Harvey Bradshaw: Delivering greater water efficiency in the business sector - Ofwat
[2] Joint-open-letter-from-Ofwat-and-the-Environment-Agency.pdf
[3] Plan for Water: our integrated plan for delivering clean and plentiful water - GOV.UK (www.gov.uk)

We have also updated our water efficiency strategy for AMP8 to include NHH customers, and it is designed to create programmes that make sustainable long-term savings as cost effective as possible. It sets out how water efficiency initiatives will contribute to our target to reduce HH PCC to 110 litres per person per day by 2050, and NHH water use by 9% by 31st March 2038 (from 2019/20 levels and excluding growth).

2.2. OUR PROGRESS DURING AMP7 (2020-25)

2.2.1 NHH Metering in AMP7

We do not have a proactive programme of NHH meter installation or replacement in AMP7. That is, we install or replace NHH meters reactively. Our proactive metering activities have been focused on delivering our HH programme which is forecast to outturn more than 139,000 new installs and 80,000 meter upgrades for domestic meters by 2024/25.

For NHH installations and replacements we operate a reactive policy in AMP7, installing new meters at the request of non-domestic customers and replacing meters on failure. These activities are funded via our base programme and through charges to retailers. Table 3 and Table 4 below show levels of NHH activity in AMP7 to date across ESW and NW regions.

TABLE 3: 2020-25 NHH METER NEW INSTALLATIONS

Region	2020/21	2021/22	2022/23
Essex NHH	8	11	9
Suffolk NHH	2	6	5
Northumbrian NHH	5	16	12
Total	**15**	**33**	**26**

TABLE 4: 2020-25 NHH METER REPLACEMENTS

Region	2020/21	2021/22	2022/23
Essex NHH	236	384	345
Suffolk NHH	133	234	315
Northumbrian NHH	414	682	767
Total	**783**	**1300**	**1427**

However, in addition to the reactive run-rates shown above, we have also accelerated a compulsory NHH meter installation programme in Suffolk to AMP7 due to the water resource issues we have in that region currently. In 2024/5 we will deliver a programme of **340** compulsory installations across Suffolk, which will ensure all NHH premises in this WRZ are metered by 31 March 2025.

In our original draft WRMP submission we did not include plans for any proactive NHH metering installs or replacements in AMP8. However, we have responded to feedback received as part of the consultation process from retailers and MOSL that NHH metering should be part of our plans. This is supported by new Government targets and MOSL's **interim metering strategy**.

Taking this feedback on board and due to the industry target to reduce NHH consumption by 9% by 2037/38, we were able to now include NHH metering and water efficiency in our revised WRMP. Our WRMP now aims to meter all currently unmeasured NHH premises in Essex by the end of AMP8 (31 March 2030), and all premises in the North by the end of AMP9 (31 March 2035) due to the larger volume of unmeasured NHH premises in that region. All of our meter replacements and new installations for NHHs will be smart meters.

Our appendix A6 – Deliverability (NES07) explains our progress on our transformation programme. This includes how we are increasing our capacity to deliver a significant programme of both HH and NHH new meters in AMP8, as well as address our supply chain challenges with new capacity to provide early infrastructure and extra supplies of new meters.

2.2.2 NHH Water Efficiency in AMP7

Water Efficiency activities for NHH customers have not been part of our AMP7 programme since retail separation in 2017, and therefore have not formed part of our AMP7 programme. However, initiatives for HH customers have long been a key strand of our demand management programme. Having initiated the first water efficiency retrofit programme in 1997, we are able to demonstrate the successful delivery of industry-leading projects, schemes and initiatives spanning twenty-five years. These activities have resulted in quantifiable water savings, unrivalled customer experiences and a significant contribution to the water efficiency evidence base.

As Ofwat allocated NHH water efficiency activities to business retail controls in 2015, there are no base allowances for non-household water efficiency.

2.3. NEED FOR ENHANCEMENT EXPENDITURE IN AMP8

Our WRMP shows that we need to meet two major demand management needs to address forecast deficits and support industry commitments and regulatory targets:

1. Deliver **50% leakage reduction** across our supply areas by 2050 (compared to a 2017/18 baseline). As set out in our WRMP, we will split this by reducing leakage by 40% in Essex and Suffolk and 55% in the North East.
2. Reduce **household per capita consumption** by 9.7% by 2030 compared to a 2019/20 baseline, to an average of 136.0 lpd. This is consistent with meeting our long-term target to reduce PCC to 110 lpd by 2050.

Table 5 below sets out the background to these needs in more detail.

The Government Plan for Water[4] target to **reduce NHH water use by 9% by 31st March 2038,** and our NHH smart metering and water efficiency programmes for AMP8 as set out in this enhancement case are also critical to these needs, contributing to an overall reduction in demand and encouraging a change in NHH customer behaviours on water use.

TABLE 5: THE NEED FOR IMPROVED DEMAND MANAGEMENT IN 2025-30

	Risk / Issue	Root Cause
1	Water Supply Deficit in Essex & Suffolk Water region. Both our Essex and Suffolk areas have a forecast water supply deficit and are classed as 'seriously water stressed'.	• The EA has reduced the amount of water we are permitted to abstract for drinking from rivers in the region, and • A changing climate in the south-east of England has resulted in reduced rainfall and subsequent reduced groundwater recharge.
2	Compliance with targets and customer expectations in Northumbrian Water region. While we are not forecasting a water supply deficit in our Northumbrian region, we must continue to deliver improvements to increase resilience and provide value to our customers.	• We have made a commitment to achieve the industry set 50% leakage reduction by 2050. • A changing climate in the north-east of England is forecast to result in reduced rainfall and subsequent reduced groundwater recharge.

Note: our evidence for the changing climate is set out in our PR24 Climate Resilience Assessment Phase A and PR24 Climate Resilience Assessment Phase B reports (documents NES52 and NES53).

[4] Plan for Water: our integrated plan for delivering clean and plentiful water - GOV.UK (www.gov.uk)

2.3.2 Our Assumptions for Base and Enhancement Investment in AMP8

Table 6 sets out the assumptions we have made to allocate investment to base or enhancement cases for AMP8. This investment does not overlap with, or duplicate activities already funded at previous price reviews.

For NHH metering, we have allocated all costs of our programme for installation of new meters to enhancement. While we have allocated most of the cost of meter replacements to base, we have allocated costs to enhancement for the incremental additional cost of a smart reader as part of the replacement activity (that is, replacement of non-smart meters with smart meters). This is consistent with the PR19 approach and the PR24 methodology[5]. We have also identified some indirect costs associated with NHH smart metering that meet the criteria for enhancement but are not included in the meter unit rate. These are needed as part of our compulsory NHH metering programme to help maximise the benefits of smart metering for affordability, leakage, and water efficiency.

Water efficiency activities linked to our NHH smart metering programme meet the criteria for enhancement due to the introduction of the new Business Demand Performance Commitment for AMP8. As we have not undertaken NHH water efficiency activities since retail separation in 2017, the shift of responsibility from retail back into wholesale is a new regulatory driver for our AMP8 water efficiency programme and is linked to our new smart metering programme. We have included this as enhancement expenditure alongside our NHH smart metering programmes.

We describe all these costs in more detail in Section 4.1.

These investments are driven by factors outside our control, as we are required to meet targets for reducing NHH demand.

TABLE 6: OUR ASSUMPTIONS FOR BASE AND ENHANCEMENT INVESTMENT

Base	Enhancement
Non-household meter replacement (like-for-like).	New non-household smart metering. Incremental upgrade to non-household smart metering for replacements. Non-household water efficiency activities to reduce business demand.

[5] Ofwat Appendix 9 – setting expenditure allowances, section 5.4

2.3.3 Our AMP8 NHH Metering programme

We are committed to our objectives to reduce NHH demand, including meeting the Government target to reduce NHH water use by 9% by 31st March 2038. In this section, we describe how we intend to use base and enhancement investment to achieve NHH PCC reductions in our North East and Essex and Suffolk areas during 2025-30.

Our metering programme for NHH customers includes the metering activities shown in Table 7 below. In contrast to our HH metering programme, where a combination of optant, compulsory and whole area metering (WAM) approaches will be employed, all new NHH meters in AMP8 will be delivered via the compulsory metering route.

TABLE 7: RANGE OF METER INSTALLATION SCHEMES

Scheme	Description
Replacement	Meters are replaced at point of failure or replaced proactively when financially viable to do so; where a smart meter may support water consumption interventions; or in our leakiest DMAs where a high density of smart metering will provide valuable data insight. We are targeting replacement of all NHH meters by the end of AMP9
New Installations - Compulsory Metering	All unmeasured customer properties have a meter compulsorily installed, where a meter installation is possible.

NHH Metering - Base Investment

Our 2025-30 base investment for NHH metering will deliver 49,495 meter replacements; 28,495 in the North East, and 21,000 in Essex and Suffolk as outlined in Table 8. Replacing these NHH meters between 2025 and 2030 will improve our data from our NHH customer base, increasing our understanding of consumption, customer-side leakage and water use behaviour and allowing us to share this better data with retailers and customers. This will enable us – as well as retailers and customers themselves - to implement more targeted water efficiency measures for commercial premises in future that will contribute to overall demand reductions.

This volume of NHH meter replacement delivered through base investment will require £8.393m of base investment (Table 8).

TABLE 8: BASE NHH METER REPLACEMENT IN NW AND ESW AREAS, 2025-30

NHH Meter Replacement	Meter count	Cost (£m)
NW	28,495	5.025
ESW	21,000	3.368
Total	**49,495**	**8.393**

Section 4.1 explains the costs for metering in more detail.

The remainder of our 2025-30 NHH metering programme is included as enhancement expenditure, as outlined below. This includes the incremental cost of replacing existing (non-smart) meters with smart meters, as shown in Table 9.

NHH – Enhancement Investment

The enhancement element of our 2025-30 NHH metering programme covers the installation of new NHH smart meters, and smart readers on replacement NHH meters. We propose to continue to install only smart meters on all NHH premises through 2025-30. This is because with smart metering, we increase the volume of consumption data collected, from six monthly to 24 readings per day. This higher frequency of data collection brings many benefits, particularly a greater insight into consumption (particularly for currently unmeasured properties) and the ability to identify leaks earlier. Smart meters are either: smart active or smart capable. A smart active meter is connected to the network, and we are receiving up to 24 readings per day. Smart capable meters can be connected to the network at a later date but are not currently activated. In the short-term, meter readings are collected by driving or walking by. By 2030 we aim to link all installed smart capable meters to a wide area network.

Table 9 summarises our metering programme in our North East and Essex and Suffolk areas, and shows only enhancement costs – base costs for replacement meters is shown in Table 8). This shows the number of meters and enhancement costs for new compulsory metering and the unit cost of a new smart reader for each meter replacement.

TABLE 9: 2025-30 ENHANCEMENT NHH SMART METER INSTALLATIONS IN NW AND ESW AREAS

NHH Metering	NW		ESW	
	Meter count	Cost (£m)	Meter count	Cost (£m)
New installation – Compulsory	3,418	1.900	1,714	0.953
Replacement	28,495	0.901	21,000	0.664
Total	**31,913**	**2.801**	**22,714**	**1.617**

In our Northumbrian Water (North East) area, our business plan includes **£2.801 million** of enhancement investment for installation of new smart meters and addition of smart units as part of our replacement programme.

In our Essex & Suffolk area our business plan includes **£1.617 million** of enhancement investment for installation of new smart meters and addition of smart units as part of our replacement programme.

2.3.4 Our AMP8 NHH Water Efficiency activities

Our NHH water efficiency programme is comprised of a wide range of activities which can be categorised within the following themes:

- **Information provision** – includes free water efficiency assessments, customer specific alerts based on consumption patterns, and customer side leakage education.
- **Infrastructure and leak investigation** – includes fixing infrastructure (e.g. leaky loos, pipe leakage, toilet replacements), installation of rain/grey water re-use, and landscaping/golf course efficiency solutions.
- **Water efficiency solutions for domestic type use** – water and energy saving products provided for free to companies using domestic type water services, including hotels, offices, schools, care homes etc.
- **Water efficiency solutions for mixed-type use** – as above but targeted at premises with mixed domestic and industry water use, such as garden centres and leisure facilities.
- **Water efficiency consultancy for industry** – prioritising premises with the highest consumption and delivered via an external contractor to ensure an appropriate level of expertise, this category includes audits, advice, and implementation of solutions for greywater reuse, rainwater harvesting and water management.

Table 10 below shows the detailed schedule of NHH water efficiency activities which forms part of our best value WRMP approach to demand management. The count of each activity in each of our regions is also shown. The development of options, and the benefits and costs associated with these activities is described in Sections 3 and 4.

TABLE 10: OUR AMP8 NHH WATER EFFICIENCY ACTIVITIES

NHH activities options	NW	ESW
Customer side leakage education	150	210
Find and fix - leaky loos (NHH self-checks/repair)	600	360
Find and fix - leaky loos (NHH contractors/cleaners - free repair)	1200	660
Garden centre changes	5	1
Domestic use self-serve	600	300
Alerts for NHH - customer specific	600	300
Educational building retrofit and reviews (University/College)	5	1
Free water efficiency assessments for NHHs	150	45
Free water efficiency visits for NHHs	300	90
Hairdresser visits	16	5
Hotel visits	9	4
Leak investigation	300	180
Leisure Centre visits	12	1
Multi-business site visits	10	10
Office visits	360	145
Pub visits	50	22
Restaurant visits	5	12
School visits	35	7
Shop visits	300	186
Specialist industrial consultancy	30	12
Golf course water efficiency	5	0
Residential care audits	0	2

2.3.5 Link to Long-Term Strategy

This investment is needed as part of the 'ensuring sustainable water supplies' investment area under our Long-Term Strategy (LTS) core pathway. We have identified the need for this investment through the regional and company level water resource management planning process.

Demand management through reducing leakage, increasing metering and supporting greater water efficiency is a necessary and efficient part of our long-term plan to ensure we can continue to balance water supply and demand.

This investment is needed to deliver our long-term targets from the **25-Year Environment Plan** and the rates of improvement supported by this case will allow us to follow the right trajectory to meeting the long-term targets that we set out in our **long-term delivery strategy** (NES_LTDS). That is, to:

- Reduce household water consumption (per capita consumption to 122 l/p/d by 2038 and 110 l/p/d by 2050).
- Reduce non-household water demand by 9% by 2038 (from 2019/20 levels and excluding growth).
- Reduce leakage by 55% by 2050 in the North East (to 61.1Ml/d) and 40% in Essex and Suffolk (to 40.1Ml/d) so that we achieve the national target of 50% companywide (from 2017/18).

This investment is also needed to deliver the long-term target from the WRMP to:

- Make sure all household customers continue to have a sufficient and secure supply of water ("plan to be resilient to 1 in 500-year drought").

We consider this is low / no regret investment because it is needed:

- to meet statutory requirements in 2025-30, and
- to meet Ofwat's high common reference scenario for water demand.

We therefore consider this investment is necessary in 2025-30 to deliver our long-term delivery strategy. This investment represents a step along the path towards delivering our long-term targets and so we expect further investment to be required at least between 2030 and 2050 to continue to reduce leakage, increase metering and promote water efficiency. This would be required under any future scenario and so is included in our core pathway in our WRMPs and our long-term strategy.

2.4. CUSTOMER SUPPORT FOR THE NEED

In April 2023, CCW carried out **research in partnership with MOSL** to understand business customer views on the potential benefits to be gained from the widespread roll-out of smart water meters. This showed that "smart water meters are understood to help reduce water usage and allow businesses to be more efficient", with 82% of respondents supporting a broader roll-out of new water meter technologies. Time and financial savings for businesses and water companies were thought to strongly outweigh any perceived drawbacks. Businesses were accepting of smart meter installation fees, provided benefits were well-communicated. Most customers saw some monetary value in receiving regular data on their water usage, estimated at £255 in the research (though this number should be treated with caution as this was an extremely low sample).

Our research also showed that reducing per capita consumption is a low priority for household customers (**prioritisation of common PCs**, NES44). They are unwilling to fund water efficiency initiatives in homes or businesses, and many want a long-term target in line with our previous long-term target (**118 l/p/d by 2040**).

When metering is presented as part of an overall water efficiency package (such as in our pre-acceptability research in 2023), customers consider this a high priority – but when tested in isolation, customer support is lower. Customers recognise the benefits of monitoring water usage and consider compulsory metering fair, but some feel that individuals should have freedom of choice. Customers suggested that educating customers on the benefits of reducing water demand and communicating in a transparent, positive way may help customers become more accepting of this change. Most customers support optant metering.

Research from Waterwise, an independent organisation promoting water efficiency and conservation in UK, showed that there is an encouraging level of public receptivity towards smart water metering when people are aware of its benefits (we include this research in our triangulation in our **customer insight summary**, NES43). Some customers are concerned about technology and accessibility issues.

In December 2022, we carried out **further research with non-households and retailers** to understand their priorities for PR24. We found that retailers wanted to prioritise metering – both by improving market data, and by rolling out smart meters across NHHs. Retailers said that smart meters would be a positive move that allows them to get more accurate reads, avoids leakage and wastage, and saves money and admin costs. Non-household customers were also favourable towards smart meters, as they said that they offer transparency, control on spend, and the ability to measure and control efficiency. Most NHH respondents said that they would value more input and leadership from us on how to use water more efficiently.

We found that some businesses, particularly unmetered micro-organisations, worry that smart meters will have a negative impact on their bills (**enhancements and other service areas**, NES43).

In our Affordability and Acceptability qualitative research, household customers thought that demand management was an important area of investment, though they were particularly focused on leakage. In Essex and Suffolk, there was some scepticism about metering. Customers supported our medium phasing option (used in our business plan) and did not want to go further to reduce leakage or install more meters. We explained that our 'low' investment would mean increased risk of being forced to take more water from rivers to supply customers or needing new water supplies. We also presented a 'high' option to go further, either by accelerating our leakage programme or installing more meters to get ahead of our targets. Customers supported the medium option because they expected us to remain compliant with Government targets but did not see the need for higher water efficiency (especially in the North East). Customers also said that the medium option did not 'go beyond and burden people unnecessarily'.

Customers considered this 'an important area of investment, both in terms of metering and leakage reduction' (**A&A qualitative research report**, NES49). Respondents across both regions also talked about customer education regarding water efficiency as an important aspect of the introduction of universal metering. Some customers, particularly in Essex and Suffolk, considered that we should invest more now to reduce investment in future.

Our WRMP sets out our rationale for choosing a mixture of supply and demand solutions, based on our customer research throughout the development of our WRMP. With separate statutory targets for leakage reduction and per capita consumption, there is limited scope for trade-off between these – so metering and water efficiency activities are still needed, alongside reducing leakage in both company networks and customer supply pipes.

We have developed our household compulsory metering programme further in response to customer feedback, allowing for increased customer engagement and activities such as water efficiency and customer supply-side leakage reduction built in – to support a more complete package of leakage, water efficiency, and metering together. We will consider how we can apply the same principles to non-households, co-ordinating both metering programmes together.

As stated in Section 2.2, we have listened to specific feedback on NHH metering received as part of the consultation process and made changes to ensure that NHH metering is a key part of our WRMP. This feedback has shaped our plans to meter all currently unmeasured NHH premises in Essex and Suffolk by the end of AMP8, and all premises in the North by the end of AMP9.

Our customer evidence and rationale are set out in more detail in our **line-of-sight document** (NES45) and customer engagement summaries.

3. BEST OPTION FOR CUSTOMERS

Our WRMP considered the options in detail (see our **revised draft WRMP for the North East** and our revised draft WRMP for Essex and Suffolk). We assessed these options using our WRMP24 planning objectives:

- Achieve a secure, resilient and sustainable supply of water for our customers, moving to a 1 in 500 level of resilience by 2049/50.
- Protect and enhance the environment, ensuring our abstractions are sustainable both in the short and long term.
- Reduce leakage from our network and from customers' homes, contributing to a national target of 50% reduction from 2017/18 levels by 2049/50.
- Reduce household customer demand to 110 l/head/day by 2049/50.
- Reduce non-household customer demand by 9% by 2037/38 (from 2019/20 levels and excluding growth); and
- For all our meters to be smart meters by 2035.

Our WRMP explains how we developed and aligned these objectives with our own purpose, vision and values; our current performance commitments and ODIs; the **Water Resources North** regional plan objectives; Government expectations for WRMP24; and the overall requirements of the PR24 Water Resources Planning Guidelines.

The feedback we have received on our WRMP from regulators and stakeholders underlines the significant investment in behaviour change needed for all water users for demand management to be successful. Comments received highlight that the roll out of smart meters may help to identify where efforts need to be targeted, but behaviour change takes time and considerable resource. It needs dedicated teams to be out working in communities and support individuals to understand why making changes to their water use is so important. We have included these engagement costs as part of our overall smart metering programme.

Section 3.1 below summarises the options we considered for NHH metering as part of our WRMP. Section 3.2 goes on to explain how we estimated costs and benefits and how we selected our preferred option.

3.1. WRMP DEMAND MANAGEMENT OPTIONS

To reduce water demand, we must increase the coverage of water meters within our areas. This is widely recognised as an effective measure for reducing water demand – for example, the National Metering Trials in the 1980s and 1990s found that this reduced demand by 12%; and **more recent research** based on Southern Water's metering programme shows that this could be as much as 22%.

Our strategy recognises and embraces the benefits of smart meters. We plan to make all new meters smart and accelerate the conversion of existing meters by 2035 to provide customers with ready access to consumption data to enable more informed water consumption decisions in line with the energy sector and regulatory expectations.

Since 2020, we have only installed smart meters at household premises – and we plan to continue this through 2025-30, extending the same approach to our AMP8 programme for new NHH meters. Although every meter now installed is smart, these are split into two categories: smart capable, and smart active. A smart active meter is connected to the network and provides hourly data; smart capable meters have the ability to be connected to the network at a later date but are not currently activated. This is because the meter is located in an area where the supporting infrastructure has not yet been installed.

Estimated benefits of metering

Our WRMP technical reports estimate the benefits of metering on reducing demand for HH metering only. The **National Infrastructure Commission 2018 review of drought resilience** states that standard 'dumb' meters can reduce average consumption by 15% and smart meters by 17%. Our neighbouring companies to our Essex and Suffolk area, Thames Water and Anglian Water, have attributed an average saving of 3% specifically to the extra insights into consumption that is received from smart meters compared to dumb meters (see link above). For our HH smart metering plan we have used an estimate of 3% saving on consumption for smart meters compared to non-smart meters to align with the experiences of neighbouring water companies (TABLE 1111).

However, we have not included any savings as a direct result of metering for NHH customers in our WRMP, and smart meter benefits only reflect a reduction in supply pipe leakage for NHH customers at present. There is limited information on the impact of smart metering on NHH customers, and therefore we have not assumed a saving based on behavioural change, as we have for our HH programme. We do not have enough evidence to show whether or not optant or compulsory metering would produce significant savings in our remaining unmetered NHH premises, which make up just 8% of total NHH customer numbers.

TABLE 11: ESTIMATED PERCENTAGE SAVINGS FROM METERS (HH PROGRAMME ONLY)

Meter installation	North East %, (lpd)	Essex %, (lpd)	Suffolk %, (lpd)
Optants	15.1% (28.3)	20.8% (38.3)	17.6% (28.8)
Compulsory	7.1% (11.7)	10.0% (17.1)	10.0% (14.7)
Smart upgrade	3.0% (4.9)	3.0% (5.1)	3.0% (4.4)

Change to an External First Metering Policy for 2025-30

From 2020, we changed our meter location policy to favour internal installs instead of external street digs. This decision was largely driven by cost and was adopted for all new domestic optant installations.

The cost of installing a new meter varies considerably across install locations – from £165 for meters installed inside customer properties (internal install) to more than £650 for meters installed outside the property at the boundary. However, external installations have more benefits. These include:

1. **Reductions to leakage.** Our WRMP shows that external meter installations would mean a reduction in supply pipe leakage of 2.33 Ml/d in the North East, and 1.96 Ml/d in Essex and Suffolk. This is because we can use smart metering data to identify both plumbing losses and supply pipe leakage (whereas if this is internal, we can only detect plumbing losses). We estimate that customer supply pipe leakage is about 10% of all water input into our network.
2. **Least disruption to customers**. This means that we do not need an appointment to fit a meter, and we do not need customers to be at home. It also reduces the likelihood of additional customer complaints as it removes the need to work within a customer's property.
3. **Easy access to the assets in future**. We know that smart technology is not infallible and there may be instances post installation where we need to return to the meter for investigation or remedial activity such as meter alarm or loss of smart connectivity.

We have decided to amend our meter location policy for both HH and NHH meters so that where a property does not have an existing boundary box, we are able to take an 'external first' approach. This is critical to delivery of our 2025-30 compulsory metering programmes, because it would be difficult to deliver at the required pace with internal installations alone.

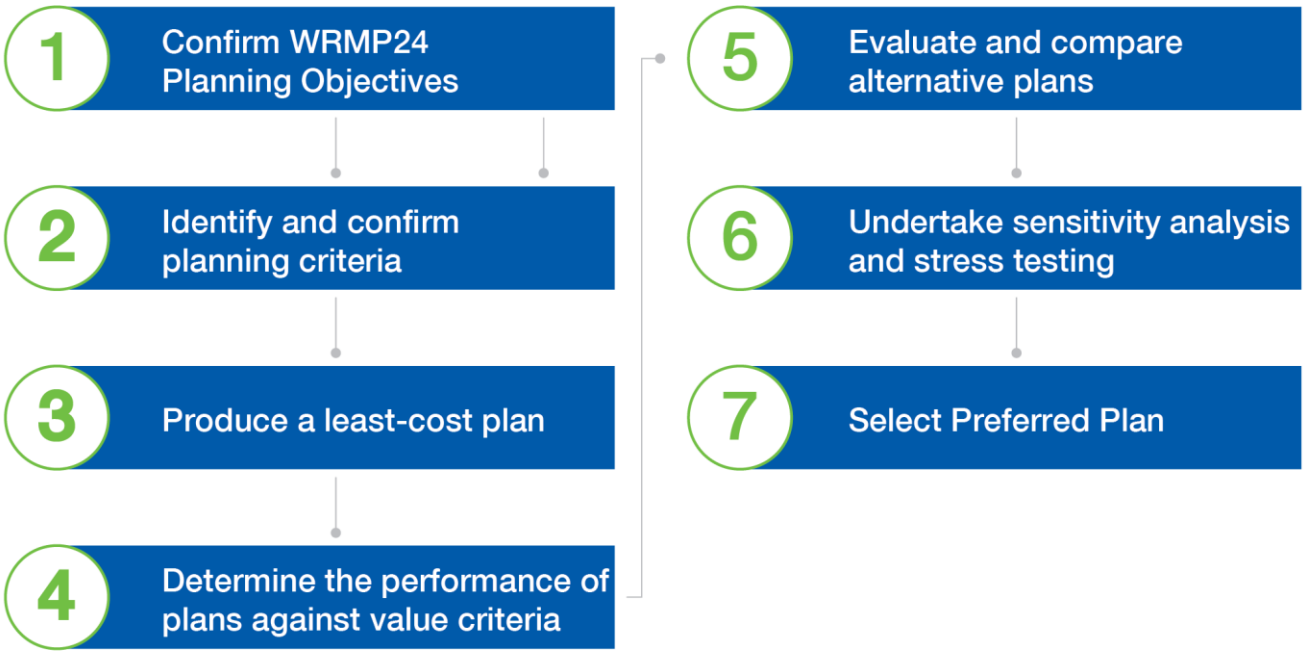
In our **household demand enhancement case** (NES15), we explain the need for increased reliance on reducing customer supply pipe leakage in future as each of our WRZs approaches the Unavoidable Annual Real Losses (UARL) limit to find-and-fix activities. An external first policy means that we would not have to relocate meters in future to allow us to tackle customer supply-pipe leakage, and so has lower whole-life costs.

3.2. DETERMINING OUR PREFERRED PLAN

In this section, we explain the cost-benefit appraisal that we undertook as part of our WRMP to select the options we present here for NHH metering and water efficiency activities.

The steps we carried out to determine the preferred plan in the North East and Essex and Suffolk areas align with the Water Resources Planning Guideline 2021 and have been informed by UKWIR's 2020 guidance '**Deriving a best value water resources management plan**'. We outline the steps in FIGURE 1.

FIGURE 1: OVERVIEW OF THE BEST PLANNING APPROACH



In each area, we investigated the 'Least Cost Plan' and three alternative plans to determine our preferred plan that would ensure a secure supply of wholesome drinking water for customers and protect and enhance the environment. The three alternative plans are:

- Ofwat Core Plan;
- Best Value Plan; and
- Best Environment Plan.

We determined our '**Least Cost Plan'** using only economic cost information. This is therefore the plan with the lowest cost to restore a supply surplus in all years of the planning period (if there were a baseline supply deficit forecast). Our Least Cost Plan includes options needed to meet national targets for leakage reduction, PCC and reductions in non-household demand[6].

Our "**Ofwat Core Plan**" includes "no or low regret" options required to maintain a water supply surplus in all years of the planning period. As with our Least Cost Plan, our Ofwat Core Plan therefore includes options needed to meet our statutory obligations including national targets for leakage reduction, PCC and reductions in non-household demand[7].

[6] Details of our Non-household demand reductions can be found in our WRMP Non-Household Demand Management Enhancement Business Case.
[7] Details of our Non-household demand reductions can be found in our WRMP Non-Household Demand Management Enhancement Business Case.

Our "**Best Value Plan**" builds on the Least Cost Plan through the inclusion of monetised and non-monetised criteria and the impact they would have on a plan to address supply and demand. The Best Value Plan therefore delivers the best value defined by the **Water Resources Planning Guideline** as 'one that considers factors alongside economic cost and seeks to achieve an outcome that increases the overall benefit to customers, the wider environment and overall society'. We explain the criteria used in Section 3.2.2 below.

The "**Best Environment Plan**" presents a plan with the lowest level of abstraction from existing sources as well as the lowest level of leakage and PCC. Therefore, each plan provided an alternative approach to restoring an area to a water supply surplus.

In our North East area, our WRMP showed that our Least Cost, Best Value, and Best Environment plans were all identical. This is because we forecast a water supply surplus in the North East area, and so our decisions were driven by the need to meet statutory long-term targets for leakage and demand reduction, rather than the need to restore a water supply surplus.

As we forecast a water supply deficit in our Essex and Suffolk areas, and therefore we need to restore a surplus, the Least Cost and Best Value Plans are not the same. We explain how we made this choice in Section 3.2.3 below.

Our North East Revised WRMP24 and Essex and Suffolk Revised WRMP24 describe all of our plans and our assessment in more detail.

3.2.1 Least Cost Plan

We used an **Economics of Balancing Supply and Demand** (EBSD) optimiser model to develop our Best Value and alternative plans for WRMP24 where we have a supply deficit (that is, for Essex and Suffolk). The EBSD model considers the supply-demand balance for each water resource zone annually and identifies options to address deficits based on cost per Ml/d, and the earliest available date of supply.

As such, the model results represent a least-cost plan with no optimisation, as it does not consider other monetised criteria such as carbon or other societal and environmental impacts. This includes supply and demand options.

In the **North East WRMP**, we explain that we did not need to use this model for the North East. This is because we had no requirement for supply options, and so this would select the same demand options to meet statutory targets.

3.2.2 Determining the Best Value Plan

We developed a list of best value assessment criteria that align with our planning objectives from WRMP and wider benefits to customers – including taking into account customer preferences and deliverability of different options. We

scored each option in the Essex and Suffolk area against these criteria to determine which would deliver the best value for customers. Our list of best value criteria is shown in TABLE 12 (this includes benefits which do not apply to NHH metering as it also considers other demand management and supply options).

We did not need to carry out the same "best value" process for the North East, because the same demand management options would be selected to meet statutory targets on leakage and demand reduction. This means that the Least Cost Plan and Best Value Plan are identical in the North East.

However, we assessed our proposed demand management options against the same best value criteria, to assess the Least Cost Plan against environmental criteria.

We assessed the performance of our Best Value Plan for our North East area by assessing each option against our Strategic Environmental Assessment (SEA) objectives, which use defined effect assessment and evaluation criteria based on relevant spatial datasets. The assessment focused on high-level issues related to the SEA objectives, sub-objectives, and key receptors and assets. The assessment indicated whether the option would help or hinder us achieving our SEA objectives. We completed a separate assessment for construction effects and operational effects. Details of our assessments are included in our **North East WRMP24**.

The Best Value Planning approach for the North East area incorporates the best value assessment criteria. The metrics enabled us to assess environmental considerations and select portfolios/programmes of options at an early stage in the planning process. For incorporation of the environmental assessments into Best Value Planning, we assumed that recommended mitigation measures would be applied.

In conjunction with Mott MacDonald (our SEA Consultants), we developed an integrated approach to programme modelling for our WRMP. It incorporates SEA into our decision-making process for WRMP24, in line with the WRMP guidance. We then used the SEA results to create metrics to support the Best Value Planning modelling. The environmental assessment metrics are outlined in our WRMP24.

TABLE 12: SUMMARY OF BEST VALUE ASSESSMENT CRITERIA

BEST VALUE CRITERIA DESCRIPTION	DESCRIPTION	UNITS
Cost of the plan	Total cost (TOTEX) of the programme	£
PWS Drought resilience	Number of years over the planning period the public water supply (PWS) drought resilience to 1 in 500 is achieved	Years
Biodiversity Net Gain (BNG)	Additional Biodiversity Habitat Units required to achieve Biodiversity Net Gain	Habitats Units (total restoration)
Natural Capital (NC)	Monetised (£NPV) impact of the option on natural capital e.g. changes to land use.	£

Leakage reduction	The volume of leakage reduction achieved over the planning period (Ml/d)	Ml/d
PCC reduction	The volume of PCC reduction achieved over the planning period (litres/head/day)	l/h/d
Flood risk management (non-drought resilience)	Qualitative assessment based on SEA objective to reduce and manage flood risk	Score
Multi-abstractor benefit	Qualitative assessment based on SEA objectives to maintain or improve the quality of waterbodies and to avoid adverse impacts on surface and groundwater levels and flows	Score
Carbon	Capital/embedded and operational total tCO2e of programme	tCO2e , £
Customer preferred option type	Options to be ranked based on customer preference survey data	% Preference
Human and social well-being	SEA objectives associated with human and social well-being	Score
Option deliverability	Options scored for deliverability / cost confidence	% Optimism Bias
The impact on designated sites	SEA objectives associated with impact upon statutory environmental designated sites	Score

To assess NHH water efficiency options, we carried out a thorough options appraisal through the WRMP24 process, beginning with an unconstrained list of 91 original options scored according to the following criteria:

- Impact on water savings,
- Impact on changing customer behaviour,
- Research value,
- Innovation value,
- Dependence on others,
- Potential to measure water savings,
- The risk involved in technology and/or products.

These scores were based on the outputs of previous research and provided the first options screening stage to define the “constrained” list of options. These constrained options were assigned a high-level cost and subject to further evaluation based on their potential for water saving.

A secondary screening stage applied the following criteria to each option:

- Is it cost effective? (Low/Medium/High)
- Is it technically possible? (Y/N)
- What is the risk of not achieving the deliverable? (Low/Medium/High)
- Does the option deliver a timely water saving? (Y/N)
- Will the option deliver a sustainable saving? (Y/N)
- Is it the same level of complexity as a household visit? (Y/N)

The short list of options was used to define our short list of activities outlined in Table 10 in Section 2.3.4.

3.2.3 Benefits of our Preferred Plan

Our WRMP presents our preferred plan for each of our North East and Essex and Suffolk areas – which is the Best Value Plan. We explain how we selected this option in more detail in our revised WRMPs.

This will ensure a secure supply of wholesome drinking water for customers and will protect and enhance the environment. Our preferred plans for our North East and Essex and Suffolk areas therefore include the demand management options outlined in Table 13 below.

Our preferred plan has been developed to:

- Address any forecast baseline supply deficits.
- Make sure we meet government expectations and national targets for:
    - Leakage reduction: 50% reduction compared to 2017/18 levels by 2050.
    - PCC: 122 l/person/day by 2038 and 110 l/person/day by 2050.
    - Non-household demand reduction: 9% reduction by 2038 (from 2019/20 levels and excluding growth).
    - Distribution input reduction: 20% reduction by 2038.
- Support other water companies through exports of water to address their supply deficits.

TABLE 13: OUR PREFERRED PLAN FOR NW AND ESW AREAS

	Essex and Suffolk area	Northumbrian area
Leakage	40% reduction by 2050	55% reduction by 2050
Metering	Compulsory metering and proactive replacement programme to be fully smart by 2035	Compulsory metering and proactive replacement programme to be fully smart by 2035
Water Efficiency Programme	Interventions to reduce PCC to 110l/head/day by 2050 Interventions to reduce NHH business demand in line with the 9% Gov target	Interventions to reduce PCC to 110l/head/day by 2050 Interventions to reduce NHH business demand in line with the 9% Gov target

In practice, our preferred plan for demand management matches Government targets for leakage and demand reduction in the long-term.

Our programme of water efficiency measures for NHH customers described in Section 2.3.4 will deliver the water saving benefits shown in Table 14 below, by the end of AMP8. Overall, across our two regions, the NHH programme will deliver a 19.68 Ml/d contribution to our water efficiency target.

TABLE 14: NHH WATER EFFICIENCY BENEFITS

	Total number of activities	NW saving (Ml/d)	ESW saving (M/ld)	Combined Saving (Ml/d)
Information provision	1,455	0.23	0.27	0.50
Infrastructure & leak investigation	3,305	2.29	1.28	3.58
Water efficiency solutions for domestic type use	4,269	4.68	2.33	7.00
Water efficiency solutions for mixed-type use	396	1.06	0.42	1.49
Water efficiency consultancy for industry	42	4.65	2.46	7.12
Total	**9,467**	**12.92**	**6.76**	**19.68**

These water saving benefits allow us to meet our target for Business Demand for a 1.8% reduction by 2030, as described in Section 3.2.4 below.

Market Operator Services Ltd (MOSL) has carried out analysis of a range of options for promoting water efficiency within the NHH market[8]. The research conducted by Economic Insight includes benefit analysis of options to be implemented by Wholesalers, including NHH metering and other measures to support NHH customers in investing in water efficient solutions. The report states that NHH metering programmes provide more detailed data on water consumption for NHH customers and are therefore critical to the effectiveness of a wider range of options that can be implemented by Retailers and Regulators to further enhance water efficiency within the sector. In addition, support for NHH customers in exploring water efficient solutions, such as those provided under our domestic/mixed customer services and our water efficiency industrial consultancy services described in Section 2.3.4, also deliver wider benefits in increasing water efficiency awareness. Our plan for NHH demand management will therefore deliver benefits beyond our WRMP and contribute to the long-term customer behaviour change required to achieve NHH water efficiency.

In addition, in our **Water Efficiency Strategy** (NES12) we have identified wider qualitative benefits of our NHH demand reduction action across both water efficiency and metering. Our programme of engagement with NHH customers will improve relationships and deliver better outcomes in the following areas:

- Improved retailer engagement with potential for an R-MeX benefit
- Increased NHH engagement with some customers (e.g. councils, leisure centres) has the potential to solve other problems including water and sewerage operation issues.

[8] Economic Insight - Options for promoting water efficiency in the NHH water market, Final Report (April 2022) (www.mosl.co.uk)

- Opportunities to engage employees, leading to greater awareness and reducing HH demand

3.2.4 Impact on Performance Commitments

Our WRMP process assesses the benefits of our demand management measures, including the impacts on performance commitments. We have worked from the bottom up using interventions and costs to forecast performance through to 2030. We align our PCL with delivering a reduction in non-household demand of 9% by 2037/38 (excluding growth) against a baseline taken in 2019/20. In AMP8, we plan to deliver 26.9% of the water saving required by 2037/38, with the remaining delivered in AMP9. This aligns to the performance in our WRMP.

Table 15 below shows the impact on our PC for Business Demand, relevant to our NHH programme for water efficiency. For the purposes of our PR24 Performance Commitment and applying a three-year average, our commitment is to reduce business demand by 1.8% by 2030 and by 7.5% by 2037/38 from 2019/20 levels. **This reflects our commitment to reducing consumption from our existing NHH customers. It excludes growth and is therefore a relative target**

Table 15 figures include growth, and therefore show an increase in business demand over AMP8.

TABLE 15: IMPACT ON NON-HOUSEHOLD DEMAND

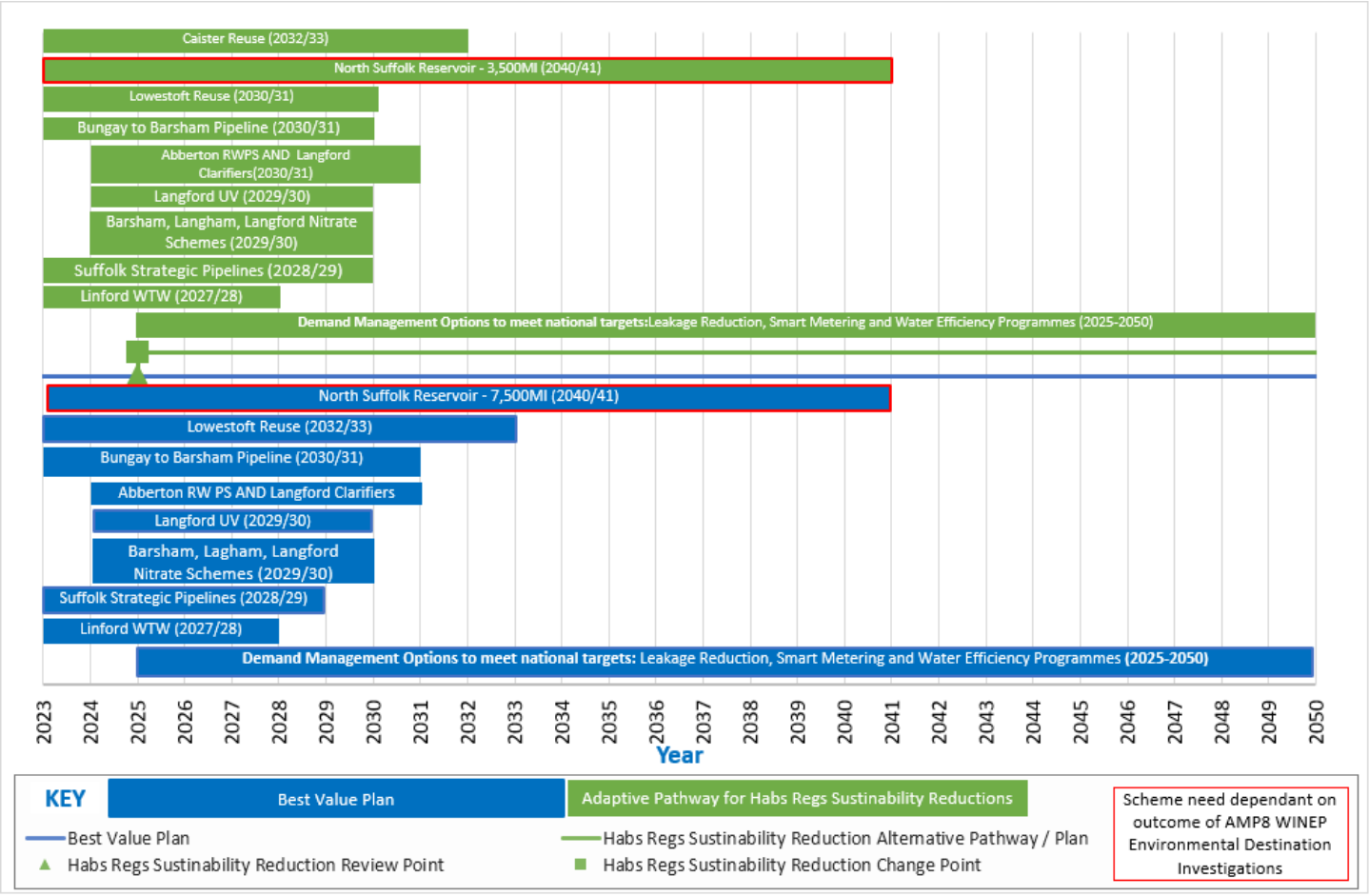
Non-Household Demand	2025/26	2026/27	2027/28	2028/29	2029/30
PCL - Annual (Ml/d)	244.3	258.5	260.7	265.7	273.5
PCL – 3 year average (Ml/d)	228.1	243.2	254.5	261.6	266.6
PCL - % from baseline (2019/20)	-4.7%	-11.6%	-16.8	-20.1%	-22.4%

3.2.5 Adaptive Plan

We developed our demand management options as part of our WRMP24 process, and these are critical to delivery of our WRMP objectives, addressing the water supply deficit in our Essex and Suffolk area and achieving commitments for leakage and PCC reduction. Our WRMP process has defined a range of adaptive pathways which are detailed in our WRMP24 submission.

Adaptive pathways provide alternative programmes for a range of scenarios including high, medium and low demand and impacts of abstraction sustainability reductions. FIGURE 2 shows a summary of our central preferred plan and the adaptive pathway for new abstraction sustainability reductions. Our smart metering programme, along with our planned leakage investment, underpins each of the scenarios by providing a baseline of PCC savings against which supply options can be programmed and optimised to deliver supply resilience and value for customers.

FIGURE 2: ADAPTIVE PATHWAY FROM WRMP24



Like our WRMP, our long-term delivery strategy shows that these demand reductions would be required under any of the common reference scenarios.

3.3. UNCERTAINTY, THIRD PARTY FUNDING AND DPC

Our WRMP examines the uncertainty around costs and benefit delivery, including examining different scenarios for supply/demand deficits, abstraction reduction scenarios, and population and demand growth. These scenarios match our **long-term delivery strategy** (NES_LTDS). We have also improved our certainty about costs, including market testing for meter installations and benchmarking (see section 4 on cost efficiency).

Our estimates of benefits are based on established industry and international good practice. There are no flexible, lower risk or modular solutions in this case.

There is no third-party funding for this case, as this is not appropriate for metering. For water efficiency, our enhancement funding relates only to activities around compulsory metering, so third-party funding is not appropriate for this either.

However, delivering water efficiency targets will need to be a shared responsibility, with our part in this largely coming from base expenditure.

The Water Efficiency Strategy will support delivery of our long-term targets to reduce PCC to 110 l/p/d by 2050. However, water companies alone cannot deliver the deep reductions in household consumption and business demand. A range of key stakeholders need to play their part. The Government has a particularly important role in delivering its own targets. We welcome the Government's Roadmap to Water Efficiency, in particular its commitment to deliver the mandatory water efficiency labelling scheme by 2025, the review of the Building Regulations 2010 and the desire to work across government to integrate water efficiency into energy efficiency advice and retrofit programmes. It is important to emphasise that such committed actions are crucial in delivering the goal of reducing PCC to 110 litres per person per day by 2050. Indeed, the impact (water savings) of such government interventions are built into the demand forecasts (lower estimate). Such policy change will support delivery of the deep demand reductions required.

We fully support the **Waterwise Water Efficiency Strategy 2030** (published in September 2022) and played an active role in its creation. The national strategy clearly outlines the need for demand management and the important roles of various stakeholders including wholesale water companies, retail water companies, Government, regulators, environmental charities and other sectors. Our household and non-household water efficiency strategies align to the national strategy across several of the strategic objectives. We lead the working group for Strategic Objective 7 (water efficiency measures are included in building retrofit programmes) and are actively involved in working groups supporting delivery of other strategic objectives.

We assessed our metering programme against the Direct Procurement for Customers (DPC) guidance (see **our assessment report**, NES40). We noted that this would pass under the 'size' test, with a whole life totex estimated as £244.1m for the AMP8 and AMP9 programme (note, this assessment was based on an estimate of metering costs from the WRMP, before we applied efficiencies from forward market testing and benchmarking). We discussed our initial proposal to use DPC for our smart metering programme with Ofwat in May 2023, as we considered that this could also pass the scalability, construction risk and operations and maintenance tests too. The metering elements of both household and non-household enhancement cases could be grouped together.

Ofwat's **updated technical discreteness guidance on DPC**, published on 3 July 2023, means that metering is excluded from DPC under the programme scalability test. Therefore, our smart metering programme is not eligible for DPC. We discuss this assessment further in **A6 – deliverability** (NES07).

Our **assessment report** (NES40) summarises our initial and final assessment of smart metering for DPC.

3.4. CUSTOMER SUPPORT FOR THE PREFERRED OPTIONS

Our customer insight summary on **enhancements and other service areas** (NES43) describes our findings on smart metering, optant metering, compulsory metering, water efficiency, and leakage reduction (for both company-side and customer-side).

Our **line-of-sight document** (NES45) explains that in our pre-acceptability testing, customers ranked "metering, encouraging water efficiency and tackling leakage to ensure we have enough water in the future" as one of the most important areas. Reducing leakage also had strong support from non-households and retailers (though not water efficiency). In our WRMP research, companies preferred reducing company-side leakage to other options (84% and 86% of participants). Customers wanted us to be more ambitious on leakage, but we do not have strong evidence that customers are willing for their bills to increase to fund reductions in leakage (enhancements and other service area summaries).

In our **Affordability and Acceptability Testing qualitative research** (NES49), customers thought that demand management was an important area of investment, and particularly focused on leakage. In Essex and Suffolk, there was some scepticism about metering. Customers supported our medium phasing option (used in our business plan) and did not want to go further to reduce leakage or install more meters. We explained that our "low" investment would mean increased risk of being forced to take more water from rivers to supply customers or needing new water supplies.

In our Affordability and Acceptability Testing qualitative research, customers thought investment in water supplies and demand was an important priority to ensure reliable supplies in the future. Many felt the medium option (used in our business plan) was appropriate as it allowed the necessary work to be carried out.

As stated in Section 2.2, we have listened to specific feedback on NHH metering received as part of the WRMP consultation process and made changes to our revised WRMP. This feedback has shaped our plans to meter all currently unmeasured NHH premises in Essex by the end of AMP8, and all premises in the North by the end of AMP9.

This area will continue to evolve as MOSL develop their non-household metering strategy. We will need to reflect their updated recommendations, as well as continuing to work with them to make sure that issues such as data standards are met. We want to make sure that retailers and non-households can use and share the data they need.

4. COST EFFICIENCY

In this section, we describe our cost methodology for NHH metering and water efficiency options. We provide our supporting evidence on the calculations and assumptions we have used (see 4.1) and show how we have developed and benchmarked these costs (see 4.2). We have clearly defined what is included in base and enhancement costs and estimated implicit allowances in base costs where appropriate. Finally, we explain our third-party assurance on costs.

All the costs in this section are before any frontier efficiency and Real Price Effects (RPEs) are applied, and so are consistent with Table CW3. We assume that Ofwat will consider how frontier efficiencies and RPEs as proposed in our Table CW1 are taken into account in their cost assessment process when comparing individual enhancements.

We have had third party assurance on our cost estimates from our provider Mott MacDonald. In their cost assurance note provided to our Board, they confirm that the expenditure forecasts included in the plan are robust and efficient. We explain our overall approach in A3 – Costs (NES04).

4.1. Cost Methodology

In this section, we explain how we have arrived at our option costs for NHH metering and water efficiency activities.

4.1.1 NHH metering costs

The costing methodology for enhancement funding associated with our NHH metering programme is summarised below and includes the following components:

- New NHH meter programme: 100% enhancement, expanding our meter coverage.
- Replacement NHH meter programme: enhancement claim only for the incremental addition of a smart reader.
- Indirect costs: enhancement costs linked to expansion of NHH meter coverage but not included in unit cost rate for metering.

New Meter Programme – estimating costs

We are using the same unit cost rates for both our HH and NHH meter installations. For our PR24 submission we carried out a preliminary contract tender exercise in June 2023 for our smart metering programme and have used the information from this to derive lower cost rates than the historic costs used for WRMP, as shown in Table 16.

Our unit costs for ‘Drop-in’ (£100.88) and ‘External Installations’ (Private £657.10 and Public £781.10) are based on the average of the two tendered prices; as this is not a final contract cost, only an initial test. The exception is ‘Internal

installation' costs (£165.51), which were not covered in the tender process, and we have calculated this based on historic actual costs (this was our preferred method at PR19, where our costs were assessed as efficient).

TABLE 16: NEW METER INSTALLATION UNIT COSTS

Location	Historic costs (ESW/NE)	Tender A	Tender B	Unit Cost (£)
Drop in	117.57 / 126.46	114.59	87.18	100.88
Internal installation	165.51 / 199.76	N/A	N/A	165.51
External installation (Private)	988.03 / 1,033.58	733.81	580.39	657.10
External installation (Public)	1,072.20 / 1,123.58	857.81	704.39	781.10

Section 3.1.2 explains our 'external first' policy, and why this is the best value option (primarily, this allows for benefits from reducing supply side leakage, which will be required to meet future leakage targets).

All of our NHH new meters will be installed under a compulsory metering approach, consistent with the installation of the 340 compulsory meters in Suffolk in AMP7. The % allocation to each meter location type for NHH meters is the same in both our Essex and Suffolk and North East areas. As with our HH metering programme, we have assumed for compulsory installation that 65% of installations would be done externally (public); 20% would be done internally; and 15% would be 'drop in'. This reflects the nature of compulsory metering and is consistent with the % split used in our HH metering programme for compulsory installations. The proportional allocation in each area is shown in Table 17 below.

TABLE 17: NEW NHH METER % ALLOCATION TO DIFFERENT METER INSTALLATION TYPES

Location	NW % split	ESW % split
Drop in	15.00%	15.00%
Internal installation	20.00%	20.00%
External installation (Private)	00.00%	00.00%
External installation (Public)	65.00%	65.00%
Total	**100.00%**	**100.00%**

We used these % allocations to define the number of new meters in each installation category and region required to deliver our new NHH meter programme. Table 18 shows the number of new meters by installation type and region, with unit costs applied to the total count to calculate a total cost of **£2.853m**. This comprises £0.953m in Essex and Suffolk and £1.900m in our North East area.

TABLE 18: NEW METER COSTS BY REGION AND INSTALLATION TYPE

Location	Unit Cost (£)	ESW compulsory	NW compulsory	Total count	ESW cost (£m)	NW cost (£m)	Total cost (£m)
Drop in	100.88	257	513	770	0.026	0.052	0.078
Internal installation	165.51	343	684	1,027	0.057	0.113	0.170
External installation (Private)	657.10	0	0	0	0.000	0.000	0.000
External installation (Public)	781.10	1,114	2,222	3,336	0.870	1.735	2.606
Total		**1,714**	**3,418**	**5,132**	**0.953**	**1.900**	**2.853**

'Drop in' meters are possible where there is already a meter chamber at the property, and therefore installation costs are much lower. We installed these meter chambers when we have previously carried out work including replacement or repair of mains and communication pipes.

Meter Replacement Programme

As we did for our HH metering programme, we have calculated enhancement costs associated with our NHH meter replacement programme based on the unit cost of a smart reader unit. The majority of our NHH meter replacement programme is allocated to base maintenance: only the cost of adding the smart unit as part of the replacement is included in our enhancement case. Our smart unit cost is £31.60, based on the current procurement cost from our existing supplier. We have applied these rates to the number of replacement meters in each region in Table 19 below. The enhancement element of our metering replacement programme is therefore £1.565m. This comprises £0.664m in Essex and Suffolk and £0.901m in our North East area.

TABLE 19: ENHANCEMENT FUNDING FOR METER REPLACEMENT PROGRAMME

Region	Smart unit cost per meter (£)	No of replacement meters	Meter replacement Base (£m)	Meter replacement enhancement (£m)
Northumbrian Water	31.60	28,495	5.025	0.901
Essex & Suffolk Water	31.60	21,000	3.368	0.664
Total		**49,495**	**8.393**	**1.565**

Metering Indirect costs

There are some additional costs that are necessary to establish our smart metering programme, particularly around customer experience and maximising the leakage reduction benefits of smart meters. We include these in our NHH metering enhancement case as these are not included in historic base expenditure. Other water companies have included these additional costs in their business plans as enhancement at previous price reviews. For example, Thames and Anglian were granted enhancement funding at PR19 (of approximately £14m and £40m respectively) for expansion of

infrastructure related to building Smart Networks, including costs for masts and connections, and development of Smart Portals and Smart Metering Centres[9].

We seek to learn from others who have undertaken smart metering programmes across the sector, including Thames Water. They noted in our discussions with them that smart metering requires additional area of operation and investment, compared to 'dumb' metering, and explained their framework for allocating some costs to meter unit rate calculations – and for allocating some costs to 'indirect' metering costs. We have used this framework (illustrated in Figure 6 below) to help drive consistency between smart metering unit rates and allow for benchmarking between companies.

Table 20 sets out our indirect smart metering costs which are not included in metering unit rates. We have set out the capex and opex for each item excluded from smart metering unit rates where we consider this to be enhancement expenditure (we have allocated any categories missing from Table 20 to base expenditure). We explain our approach to additional water efficiency in 4.1.2.

[9] Green Economy recovery: Final Decisions, 29th July 2021 (http://www.ofwat.gov.uk/wp-content/uploads/2021/07/green-economic-recovery-final-decisions.pdf)

FIGURE 6: FRAMEWORK FOR ALLOCATING SMART METERING COSTS (MARCH 2023)

Cost categories	Sub-categories
Meter device	Meter device
	Local comms equipment (LCE)
Meter installation (in-house or contractor + fixed costs)	Digs
	Internals
	OSV installation
	Unmeterable property survey
Internal fixed-costs	Internal fixed-costs
Field investigations	Stale meters, tech issues
Smart meter comms (fixed network,phone network)	Installation / set-up
	Annual maintenance / licence
Smart meter operational centre (SMOC)	Staff and IT
Meter data management system (MDMS)	Build and set-up
	Annual licence / upgrades
Additional customer-side leakage	Getting customers into account
	Maximising demand reduction benefit
Additional water efficiency / wastage	Water efficiency home visits
	Separate wastage fix visits
Digital engagement portal (app, online account, email platform)	Build and integration
	Annual maintenance / licence
Customer journey	Literature and customer comms associated with compulsory installs

Cost categories suggested to be included in meter unit-rate calculation

Cost categories suggested to be excluded from meter unit-rate calculation

These costs can be included in Enhancement Cases or other Botex budgets, as they are likely to be needed for a smart metering programme

TABLE 20: SUMMARY OF INDIRECT METERING ENHANCEMENT COSTS

Category	Sub Category	Capex (£m)	Opex (£m)	Opex (annual) (£m)	Rationale
Field Investigations	Stale meters, technical issues	-	0.060	0.012	Investigation and resolution of issues with smart meters not communicating. Based on current failure rate data, we have assumed that 2% of the meters installed in AMP8 will require a field visit to resolve issues and 7% will require a desktop check.
Smart Meter Comms (fixed network, phone network)	Annual maintenance / licence	-	£0.200	£0.040	The smart comms market now tends to operate an Opex model which charges an annual per-meter fee for data services. We have assumed an annual £1.35 cost per smart end point cost based on the AMP8 programme profile. This is for NHH new meters and meter replacements only
Customer Journey	Literature and customer comms associated with compulsory installs	£0.750	-	-	Marketing and community engagement campaign at the same time as smart meters are being installed. The community presence will move area by area with the smart roll-out.
Total (£m)		**£0.750**	**£0.260**	**£0.052**	

We summarise our indirect costs of £1.010m (Totex) in Table 20 and explain this further in the sections below. This is split into £0.48m in Essex and Suffolk, and £0.530m in the North East. We considered and removed some costs relating to smart metering – including setting up our meter data management systems and setting up our smart metering communications – as these can be delivered using base expenditure.

Field Investigations

As we deploy smart meters, a proportion will be subject to early failure and connection issues resulting in a loss of the smart meter data. This will require an initial desktop assessment followed by a field visit to resolve in some cases. Based on current failure data, we have assumed that 2% of new meters installed in AMP8 will have communication/network issues requiring a field visit to resolve and 7% will require a desktop check. It is assumed that 8 field visits per field staff, and 30 desktop checks per advisor, can be completed per day. We have calculated a requirement for additional FTE field technician, supervisor roles, and office-based advisors profiled across AMP8 and peaking at 1 FTE in year 5. Costs are based on the average salaries for the roles required.

Smart Meter Comms

Advances in technology are driving changes in the smart network communication infrastructure market, which – like many IT services – now tends to operate on an opex basis rather than the previous front-end capex-heavy model. This model

charges an end-point fee (per meter per year) for providing a data service. Some of the smart communications solutions we are considering have a low infrastructure cost because they operate open standards. For example, in the case of Long Range Wide Area Network (LoRaWan) anyone can use the infrastructure once installed in an area. In addition, we expect to have delivered a large proportion of our core infrastructure roll-out by the end of AMP7, thus lowering the cost impact on AMP8.

Our licencing and maintenance costs are based on an annual cost per smart-point (on new and replacement meters) of £1.35. We have calculated the overall cost for the AMP based on the profile of the AMP8 metering programme, that is, meters installed in year 1 will incur five years of annual cost while meters installed in year 5 will incur only one annual cost.

Customer Journey

To support the rollout of smart and compulsory metering, we need to be engaging with retailers on the practicalities of compulsory metering and how to be water efficient. These conversations need to take place before, during, and after the installation and we need to be available in person, in communities, and online.

We need to mitigate the impact of activities on BR-MeX, complaints, our wider reputation, and provide support to those who, without intervention, are expected to be worse off with a meter. Customers need to understand what's changing, how it affects them, what they can do to save money and what support is available. These costs will provide marketing and engagement aligned to the smart meter installation programme.

The level of AMP8 enhancement funding is based on:

- £0.40m for a comprehensive marketing campaign to support compulsory metering
- £0.35m to engage with retailers, non-household customers, and business groups.

4.1.2 NHH water efficiency costs

Table 21 summarises the costs for our NHH water efficiency programme. These have been calculated based on unit costs for each activity type, applied to the numbers of each activity (detailed breakdown shown in Table 10 in Section 2.3.4).

TABLE 21: SUMMARY OF NHH WATER EFFICIENCY COSTS (£M)

Category	NW Cost	ESW Cost	Total Cost
Information provision	0.051	0.041	0.092
Infrastructure & leak investigation	2.518	0.353	2.871
Water efficiency solutions for domestic type use	1.263	0.674	1.937
Water efficiency solutions for mixed-type use	0.456	0.171	0.627
Water efficiency consultancy for industry	0.927	0.478	1.405
Total (£m)	**5.215**	**1.717**	**6.932**

The unit costs used to calculate our total cost for each activity are derived from a range of source data. As we do not currently have a NHH water efficiency programme, we have used internal cost data where possible for equivalent activities in our AMP7 household programme, and obtained external data to build estimates for activities where we currently have no relevant cost data: The sources of our cost data are summarised below:

- **AMP7 delivery of household water efficiency activities**. Where activities for NHH customers are of the same scale and complexity to equivalent activities delivered via our AMP7 household water efficiency programme, we have calculated run-rates and adjusted to 2022/23 prices. For example, the cost of fixing 'leaky loos' and toilet replacements are the same regardless of HH or NHH premises.

- **Specialist company data.** Our rainwater harvesting and garden centre costs are based on data provided by a specialist contractor with extensive experience delivering similar solutions.

- **Other water company data**. Elements of our activity costs are based on data provided by Thames as part of a data sharing initiative. As Thames Water is currently delivering an extensive AMP7 NHH water efficiency programme, we have been able to use this industry insight to derive cost rates for equivalent activities. We have used this data to assess the relative cost of conducting water efficiency visits to a range of different NHH premises, including hairdressers, schools, hotels, leisure centres, offices and pubs.

- **Consultancy pricing**. Costs for procuring external advisory for specialist industrial customers, golf courses and landscaping redesign activities have been based on specialist consultancy rates for each activity.

4.2. Cost benchmarking

4.2.1 NHH metering benchmarking

We described some of our evidence that the cost estimates are efficient in section 4.1 (for example, describing the use of similar scheme outturn data, current contractor costs, and forward-looking market testing where possible). We have also carried out some external cost benchmarking to test if these costs are efficient compared to the rest of the sector.

Metering costs are not readily available separately for internal, external, and drop-in installations. At PR19, Ofwat's models used a single unit rate for metering, which incentivised companies to move to internal meter locations if this was cost-beneficial in the short-term, rather than thinking about the long-term benefits.

Our unit cost for new meters (HH & NHH) at PR19 was £256.01, compared to Ofwat's benchmark unit cost of £286.74 and the industry average unit cost of £279.11 (all costs inflated to 2022/23 prices). Ofwat allowed for a higher unit cost for London installations, and (in the Green Recovery determinations) allowed an additional £33 per meter reflecting additional costs linked to compulsory metering.

We explained in 3.1 and 4.1 that the location of meter installations can make a big difference to the costs. So, we set out to benchmark an 'internal first' and an 'external first' option against industry data, comparing each to adjusted PR19 unit rates and AMP7 APR data. Our costs for both options are based on the same unit rates derived for four location categories:

- Drop In
- Internal Installation
- External Installation (Private)
- External Installation (Public)

The difference in cost between the internal first and external first options is driven by a different percentage split of the location categories. The external first programme includes a much higher percentage of external installations, which carry a higher cost than internal installations. The percentage splits applied throughout the programme are based on actuals that have been collated for over two years and are representative of our likely PR24 implementation (see 4.1.2 for details).

We derived unit costs for the Drop In and External Installation (Public) categories from the averages of two contract tender costs (as described in 4.1). External Installation (Private) costs are derived from the External Installation (Public) breakdown, with the removal of the street works, sample inspections and two-way light costs. Finally, the Internal Installation unit cost has been taken as the lowest value from bottom-up estimates across different regions.

We have applied the PR19 methodology, which does not differentiate between different installation locations, and have updated to reflect the frontier shift driven by an annual 1.10% efficiency challenge. This requires an inflation forecast between 2025 and 2030, for which we have used the Consumer Prices Index including housing costs (CPIH). The resulting frontier shift is 4.05%.

The econometric position for both our Internal First and External First options is shown below, alongside our calculated industry benchmarks.

Our benchmarking analysis is based on a programme of 183,813 meters, equivalent to the number of new installations included in both our Internal First and External First options for our AMP8 HH metering programme. Table 22 shows our option costs alongside the econometric benchmarks. All costs are in line with 2022/23 price base.

TABLE 22: NEW METER INSTALLATION BENCHMARKING

	Cost (£m)
External First option	88.66
PR19 Econometric	52.28
APR Installations only	69.37

Our new meter unit rate required to deliver our External First Policy is calculated at £482.34 per meter. While this is shown to be higher than the benchmarks, this is primarily due to the higher proportion of more expensive external installations required by our compulsory metering programme in Essex and Suffolk which will deliver the benefits outlined in Section 2. While an Internal First approach would be more in line with the benchmark, this is only because it relies on a significantly higher proportion of cheaper internal installations.

Benchmarking for replacement smart metering costs

At PR19, our cost for smart readers for replacement meters was the **lowest industry benchmark cost** (£24.85 in 2017/18 prices). Other companies included additional costs at PR19 relating to field visits and network/system connection costs, which were partly allowed – including comms, abortive visits, un-meterable properties and support costs. In the Green Recovery determinations, Ofwat set a “replacement meters” benchmark at £40 in 2018/19 prices – our unit cost for replacement metering is efficient at **£31.60** in 2022/23 prices and is likely to remain the industry benchmark (lower than our PR19 costs, in real terms).

This is partly because we have not included masts or infrastructure costs, or field and connectivity costs within our unit rates.

Benchmarking indirect metering costs

We have applied the same benchmarking to our NHH indirect costs as we did for our NHH programme. This is based on data from PR19, where other companies were funded for some indirect costs, including for example for Thames Water:

- £11m to build smart networks, including masts and infrastructure.
- £3.3m for developing a smart portal and smart operations centre.

Anglian Water was funded for £40m of indirect cost to build smart networks, and Thames was funded £14m. While a direct cost comparison is not possible, due to the range, proportion and varied cost of different activities, we carried out a high-level benchmarking exercise of our HH and NHH metering programme to broadly demonstrate the relative cost-per-meter associated with metering indirect costs. Table 23 below shows our indirect costs divided by the size our smart meter programme, compared to Anglian and Thames (Thames and Anglian PR19 costs have been adjusted to 2022/23 price base).

TABLE 23: METERING INDIRECT COST BENCHMARKING

	Metering Indirect cost (£m)	Smart Programme (no. of new meters)	Cost per meter (£)
Thames Water	14.282	203,000	70.35
Anglian Water	40.573	538,904	75.29
Northumbrian Water (HH)	17.290	664,810	26.02
Northumbrian Water (HH + NHH)	18.300	669,942	27.32

The figures show that our indirect metering costs, when presented as a cost per new smart meter, are significantly lower than other companies granted funding for similar activities at PR19.

Indirect metering costs for individual activities are more difficult to benchmark with the sector, and we have been unable to derive unit costs across the sector. Instead, we have estimated our costs based on known market rates (such as salaries) and market testing with our supplies (see section 4.1). We have compared the individual items to previous smart metering programmes and have provided the details of these costs and how we have estimated them.

4.2.2 NHH water efficiency benchmarking

As described in Section 4.1.2 our NHH water efficiency costs are comprised of a range of elements and based on our existing AMP7 run rates for each activity (such as installation of Home Flow Restrictors, leak investigation and repair etc). While we believe our costs to be efficient, there is no industry data available at sufficient granularity to support cost comparison for these individual components.

However, as with our metering indirect costs for HH and NHH, we have carried out a high-level benchmarking exercise based on funding for similar activities granted to companies at PR19 Final Determination. At PR19, Anglian was funded

£20.1m for its water efficiency programme related to smart metering. Table 24 below shows a cost-per-meter comparison, based on the scale of investment and the relative size of Smart Metering programme. The figures show that our indirect metering costs, when presented as a cost per new smart meter, are significantly lower than those funded at PR19 for similar water efficiency activities. While our cost-per-meter is significantly higher for NHH than HH water efficiency activities, our overall programme still benchmarks favourably against the Anglian Water PR19 costs.

TABLE 24: WATER EFFICIENCY LINKED TO SMART METERING COST BENCHMARKING

	Water Efficiency cost (£m)	Smart Programme (no. of new meters)	Cost per meter (£)
Anglian Water	20.100	538,904	37.30
Northumbrian Water (HH)	7.594	664,810	11.42
Northumbrian Water (HH + NHH)	14.526	669,942	21.68

5. CUSTOMER PROTECTION

Customers are protected through performance commitments and ODIs on business demand reduction. These performance commitments, which reflect the additional performance from enhancement cases as well as the performance achieved from base expenditure, protect customers if our investments do not deliver.

Although metering does contribute considerably to business demand reduction, this ODI is not sufficiently large to protect customers.

5.1. PERFORMANCE COMMITMENTS

Effective NHH metering can reduce the volume of water consumed by our NHH customers. We are incentivised to reduce NHH through the business demand[10] performance commitment (PC). In turn, protection for customers is provided through this PC. The business demand PC for NHH water consumption, along with leakage and per capita consumption PCs[11], span our AMP8 demand management commitments. A summary of our AMP8 PCs is included in Table 25.

TABLE 25: SUMMARY OF AMP8 NON-HOUSEHOLD PERFORMANCE COMMITMENT

Performance Commitment	AMP8 (2029/30) target compared to 2019/20 baseline	AMP7 (2024/25) target compared to 2019/20 baseline
Business Demand	1.8% across the region (excluding growth)	N/A – (no AMP7 target)

We will continue to report on our progress reducing business demand through our Annual Performance Reports.

5.2. PRICE CONTROL DELIVERABLES

Our approach to determining Price Control Deliverables (PCD) is outlined in section 12.3 of A3 – costs (NES04). Our assessment has highlighted that the benefits we expect to deliver through our 2025-30 NHH enhancement programme will partly be measured through the business demand PC, providing protection for customers.

In addition, given the scale of our 2025-30 smart metering programme, we have included a PCD related to delivery of our 2025-30 metering plan, to make sure our customers are protected. In Table 26 below, we assess these enhancements to test if the benefits are linked to PCs; against Ofwat's materiality of 1%; and to understand if there are outcome measures that can be used.

[10] Ofwat, 2023, PR24 Common Performance Commitments, Business Demand, Version 0.2.
[11] Household demand management is covered in our WRMP Demand Management Enhancement Business Case.

TABLE 26: ASSESSMENT OF BENEFITS AGAINST THE PCD CRITERIA

Enhancement scheme	Benefits linked to PC?	Materiality	Possible outcomes?
Water resources – NHH demand management (NES36)	• Partial fail – benefits of metering to business demand • Partial fail – benefits of metering to leakage	Fail – <1%	Partial link to business demand. Number of meters installed

Ofwat's guidance on PCDs suggests that for metering PCDs, the number of meters should be identified as the deliverable. This should be split by type of work (new installation or upgrade) and technology (basic, AMR, AMI). Ofwat will then consider whether to aggregate deliverables across meter types and technology in the determination process, depending on the extent to which these factors affect costs.

As we set out through this enhancement case, we have split our metering costs into new installations and upgrades, with **only** fully smart (AMI) meters installed during 2025-30. However, we have demonstrated that different installation options have quite different costs – and so we propose that our PCD should be split by installation location. This protects customers in the event that, for example, we decided to complete only internal installations to avoid costs.

In our household demand enhancement case, we propose unit rates for meter installations. Rather than using a separate PCD rate calculation for non-household metering, we propose simply using the same rates as for household metering. This reduces the complexity of PCDs. Table 27 below replicates the PCD rates from our household metering enhancement case (NES15) and adds the baseline for NHH meters.

TABLE 27 : PROPOSED PCD RATES, METERING

Location	PCD rate (no calibration)	50% cost sharing	45% cost sharing	40% cost sharing	Baseline expected
Drop in	£46.24	£23.12	£25.43	£27.74	770
Internal installation	£110.87	£55.44	£60.98	£66.52	1,026
External installation (Public)	£726.46	£363.23	£399.55	£435.88	3,336
Meter replacements (enhancement only)	£19.51	£9.76	£10.73	£11.71	49,495

The delivery of our metering programme is set out by year in our business plan tables, and so Ofwat will be able to use this to monitor our progress throughout the PR24 period. A summary of our PCD for metering is outlined in Table 28.

TABLE 28: SUMMARY OF THE PRICE CONTROL DELIVERABLE FOR METERING TO PROTECT CUSTOMERS

Description of price control deliverable	We will return money to customers in the PR29 final determinations based on a unit rate for NHH meters delivered, split by drop-in; internal; external (private); external (public); and replacements with a smart meter module (as in Table 27 above). This will be calculated by multiplying the PCD rate by the actual number of meters installed in AMP8 for each type of installation, and then adding these results to calculate an "actual allowance". The total "PCD baseline allowance" is calculated by multiplying each PCD rate by the baseline expected numbers in Table 27 above. We would then return money to customers equal to the "PCD baseline allowance" minus "actual allowance", or zero if the "actual allowance" is greater than the "PCD baseline allowance".
Measurement and reporting	We will report the number of meters installed in our APR (for new meters and replacement meters, this is currently reported in APR Table 6D), and we will track the types of installations as one of our metering programme KPIs. Ofwat does not currently collect information on internal and external installations, but we recommend that they consider doing so from 2025/26.
Conditions on allowance	No additional conditions – this should include the final baseline numbers and "PCD baseline allowance" after calibration.
Assurances	We will provide external assurance with our PR29 business plan on the number of actual and projected installs of each type, and a calculation of the amount of money returned to customers. PCDs cannot currently be included within in-period determinations of ODIs, so Ofwat will need to set out how this would be reconciled for the "blind year" in 2029/30.
Price control deliverable payment rate	Variable, as per Table 27 and the description of calculation
Impact on performance in relation to performance commitments	The impact of this enhancement expenditure on business demand is set out in this business case and in our business plan tables.