



# PR24 Methodology consultation response

Appendix 1 – a fuller  
response to Q5.1 (water  
demand)

7 September 2022



## A Incentivising water demand reduction through leakage and usage reduction

- 1.1 We support the increased focus on demand reduction via a dedicated performance commitment approach. We recommend adopting two separate performance commitments, based on Megalitre per day (Ml/d), one for leakage and another for usage reduction, which will cover combined household (HH) and non-household (NHH) usage reductions.
  - For leakage, we recommend maintaining existing performance commitment that is measured in Ml/d, in line with the 2050 leakage reduction roadmap set-out and signed up to by all water companies
  - For usage reduction, we recommend adopting a single Ml/d water saving performance commitment to incentivise water efficiency delivery across both household and business customers
- 1.2 Clear separate Ml/d-based performance commitments for leakage and usage reduction, will allow water companies to actively play their role within Defra's future National Water Target and wider environmental improvement agendas. Defra's proposed high-level target will help drive all sectors to play roles in reducing usage and leakage.
- 1.3 Reducing water demand is a societal agenda. Total water demand, business demand and per capital consumption are materially affected by exogenous factors outside water companies' influences. Leakage and usage reduction are more effective metrics to drive demand reduction and water efficiency.
- 1.4 Under the Ml/d based usage reduction metric, water saving is delivered through water companies' activities including wider partnership working. This is similar to Ofwat's proposal on River Water Quality performance commitment that measures the reduction in phosphorous through water company activities including wider partnership working. We have developed the reporting methodology for Ml/d based usage reduction, building on a wide range of water efficiency activities that have been delivered over recent AMPs as part of our demand reduction programme and reported against Water Resource Management Plan (WRMP) targets. We shared the reporting methodology with Ofwat on 17th June 2022. The Ml/d-based usage reduction metric in PR24 would supersede current Per Capita Consumption (PCC) performance commitment.
- 1.5 Water efficiency should cover all customers including large business customers. Whilst we support the inclusion of NHH demand reduction within wholesaler remit, we are concerned your proposal to exclude large business customers from Business Demand or the combined Water Demand metric. Such exclusion will not just miss the great opportunity but also disincentivise water companies to engage with large users to deliver material demand reductions. We urge Ofwat to make evidence-based decisions.
  - As presented at the recent Waterwise Smart Meter Forum (Dec 2021) and to the RWGWEG and MOSL smart meter data from over 25k business, representing all major business categories and sizes, shows that circa 26% of the total water being delivered to NHH sites, was registering as 'continuous flows' (incl. customer-side leakage, internal wastage and some usage). This data clearly supported the opportunity for water efficiency improvement to be delivered across all business categories and sizes



- Thames has achieved significant measurable water savings on large business users through our Smarter Business Visit (SBV) programme (circa 10MI/d). Much of these valuable savings have been delivered on large business customers
- To limit the impact of business cycles and changes to working patterns on performance commitment reporting, an MI/d based performance commitment could be specified to only count water reductions resulting from water companies' activities, including joint-working with Retailers

1.6 We do not consider a combined Water Demand performance commitment, measured as the percentage reduction of 3-year average in ml/d from 2019/20 baseline, is effective for water efficiency or demand reduction.

- The proposed approach ignores impacts from population and economic growth
- Government driven growth and economic development are having significant but disproportionate impacts on regional water demand
- Having clear, measurable, and separate leakage and usage reduction targets, maintains a water company's focus on these two agendas



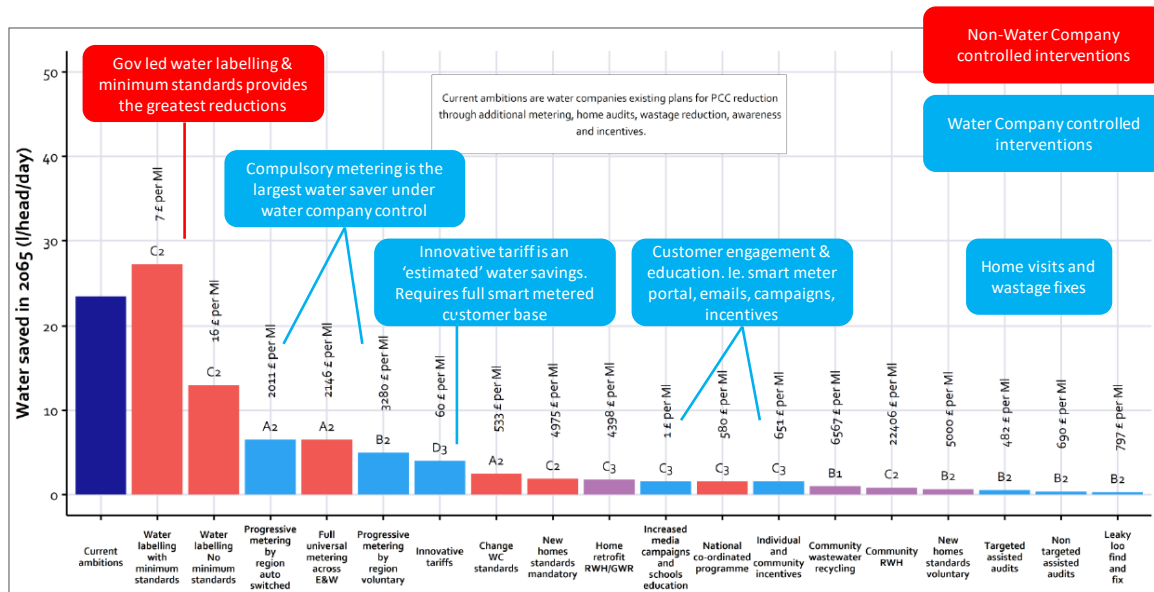
## B Reducing water demand is a societal agenda

- 2.1 We agree with Ofwat referencing research that suggests that ‘conjunctive use of different techniques is crucial for achieving long-term water conservation habits’. However, we are concerned that a single foreign academic paper has been used, which doesn’t include UK based research or field-based initiatives, to inform PR24 water demand PCs. Whilst some of the insight gathered from the US, Australia, China and EU is informative, there are some fundamental differences with these countries’ water policies, infrastructure and water use cultures, compared to England. For example, 100% water metering has been in place for generations; they have experienced multiple droughts to drive behaviour change, and the majority of their water conservation actions are led and delivered by government policy, product labelling and water use restrictions. The water conservation ‘outcomes’ within these countries are not led by water companies, and their water utilities are not solely accountable for delivering water conservation.
- 2.2 To effectively incentivise water demand reduction, it’s important that AMP8 performance commitments reflect water company actions and influences, rather than seeking to place full responsibility of a wider societal agenda and target. We agree that water companies can influence water demand, however, water company actions have been quantified as having a minor influencing role only within the wider policy, culture and society changes needed to achieve the desire water conservation outcome. To assist with the water sector’s response to Defra’s consultation on Personal Water Use Targets in 2019, Water UK commissioned Artesia to undertake an assessment of ‘Pathways to long-term PCC reduction’ to identify the largest demand reduction opportunities available to the UK and quantify their potential water savings and benefits to domestic usage reduction<sup>1</sup>. As shown in Figure 1, the study found that aside from weather and quality of population data, a mandatory water label and changes to building regulations / fittings standards were identified as offering the greatest household usage reduction opportunities. It was found that the largest factors and activities influencing PCC were not within the control of water companies. Metering and water efficiency are fundamental parts of the wider PCC reduction agenda, but deliver considerably smaller water saving volumes in comparison.

---

<sup>1</sup> Pathways to long-term PCC reduction (WaterUK, 2019) <https://www.water.org.uk/wp-content/uploads/2019/12/Water-UK-Research-on-reducing-water-use.pdf>

Figure 1: Breakdown of the major demand reduction opportunities, colour coded between within and outside of water company control.



Source: Thames Water

## C Total water demand including business demand is significantly affected by exogenous factors

3.1 We do not support the use of a total combined metric that is based on abstraction or distribution input (DI). Total abstraction or DI metrics are inappropriate for demand reduction performance commitments, as the following external influencing factors impact total water demand significantly more than water company-controlled demand reduction activities;

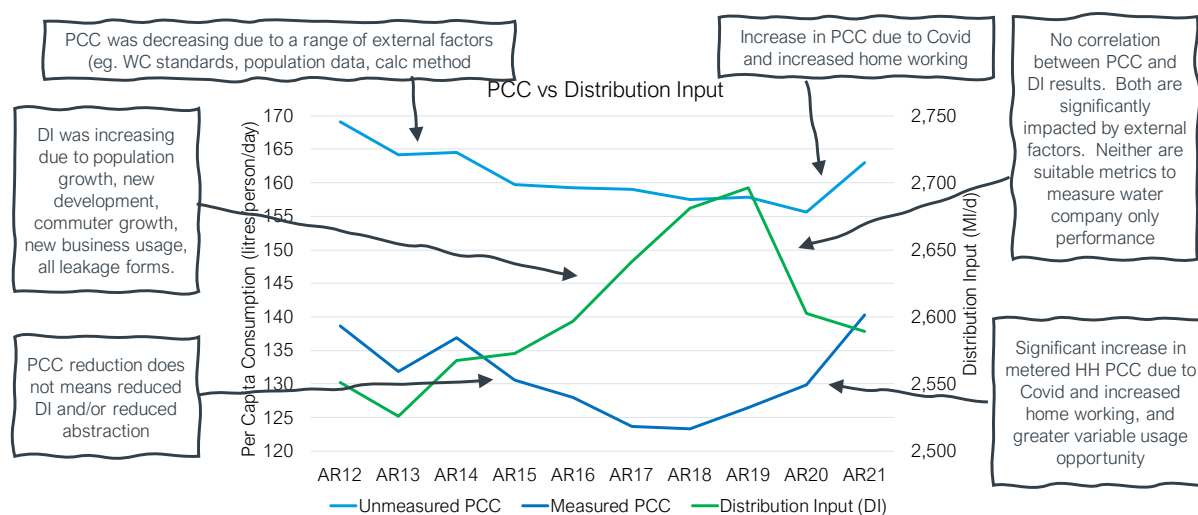
- **Extreme weather:** recent record heatwaves resulted in significant water use increases in homes with gardens / outside space. When temperatures reach and exceed 26 degrees Celsius, average daily consumption in terraced, semi-detached and detached homes increased by 17%, 32% and 51% respectively (measured through >600k smart metered households). Climate change is making heatwaves more extreme and frequent.
- **Regional growth:** population and economic growth at regional level can significantly drive up total water demand.
- **New industries:** The shifting focus in technology and energy sectors is seeing an increase in new industries or development applications that have very significant new water demand. One such example is Data Centre (DC) development. Thames recently commissioned Jacobs to undertake a study into DC growth and water demand projections, which concluded that DC development in the Thames Water supply area could require an additional 60 MI/d by AMP9. The new water demand from this one business sector alone could offset the demand reductions from our AMP8 smart metering programme.
- **Hybrid working:** The balance and total volumes of household and non-household water consumption are currently changing, due to the increase in home or hybrid working, following the impacts of the Covid pandemic. The significant proportion of the working population are now working from home, either full or part-time. This shift in working location is resulting in a change in where and how water is being used. This means that legacy PCC values will no longer be viable for target benchmarking. We don't yet know the full impact of hybrid working, however more water is being used in homes and we are seeing increases in peak demand during summer months, due to more opportunity for discretionary (outdoor/garden) water use on weekdays.

3.2 The growth forecasted in population, domestic and business development, plus the introduction of new industry water demand within the Thames region, means that total abstraction and DI is significantly influenced by external forces, greater than the water company-controlled demand reduction activities. Therefore we do not support the use of total water demand like total abstraction or distribution input (DI) as an AMP8 performance commitment.

## D Per capita consumption is not an effective water efficiency metric for water companies

- 4.1 We do not consider having separate measurement and reporting metrics for the same activities delivered on homes (PCC) and businesses (volumetric such as MI/d), to be appropriate.
- 4.2 Smart meter data has shown that a PCC metric is not a good representation of actual water abstraction or Distribution Input volumes. Over the past few years of water supply and usage monitoring within the Thames region, PCC trends did not match actual water abstraction or DI trends – highlighting that PCC is not an ‘outcome’ metric. Whilst PCC can and should still be tracked and reported annually, it’s not a suitable value for performance commitment purposes, due to the high level of estimation and poor correlation to wider water reduction objectives.

Figure 2: PCC vs DI overlay for Thames Water smart metered households, showed no correlation between PCC trend and DI volumes.



Source: Thames Water

- 4.3 Smart meter and the increasing levels of more accurate usage data, will shift PCC baselines, irrespective of actual demand reduction activity. This is due to the current PCC methodology reliant on population or occupancy numbers, which are predominantly estimated. Smart meter data is improving our understanding of usage / wastage / leakage. The increasing amounts of usage and occupancy data through smart metering, will cause a re-occurring need to re-baseline PCC values, due to data quality only. This creates an unstable methodology for long-term performance commitment reporting.
- 4.4 We do not consider that the PCC metric is an appropriate measure to hold companies to account for their contribution. We list below the reasons and supporting commentary as to why the PCC metric is not effective for this purpose and should be reviewed and replaced with a more suitable metric.

Table 1: A list of major factors and variables that influence the PCC metric calculation, broken down by in and out of water company control / influence.

Factor influencing water use / PCC	Water company controlled	Commentary
Weather	No	Weather significantly changes household water use. Whilst the PCC 3-year rolling average methodology allows for some smoothing of weather impact, Artesia's 'Pathways to long-term PCC reduction' clearly showed PCC differences between northern and southern areas influenced by climate. This study showed different PCC baselines across different regions, highlighting that inter-company comparisons is not a suitable method for both setting targets or measuring performance. Recent heatwave and extreme weather is significantly impacting customer usage and making a 3-year rolling average less suitable.
Population data quality	No	The PCC calculation is vulnerable to the quality and accuracy of population data. Sourcing population data is inconsistent across the country, and a robust measured household usage value can produce different PCC values depending on the population data source and quality. Covid has impacted the daily population movement and population of home working, of which both values are dynamic and unknown. The PCC calculation method turns good quality measured data and into poor quality estimations.
Household occupancy	No	Largest variable influencing per household water use. Water companies do not control or influence household occupancy. Occupancy data accuracy and availability is poor and all estimated, consequently impacting on the quality of PCC calculation outputs.
Ethnicity & religion	No	Significant differences in daily water use totals due different cultural practices and religious requirements. Differences in average household consumption is being recorded up to 50% variance. The different proportions of these ethnicity demographics within a supply area has a very significant impact of total household water use, total water demand, thus changing PCC outside of water company control.
Housing stock type	No	Each housing stock type will have different average occupancies, which can also vary by region. eg. proportion of detached properties vs flats. Each water supply area has a different proportion mix of housing types, resulting in different water use and PCC values. Water companies do not control nor influence the mix, nor volume of housing stock built to meet government housing targets, and are not statutory consultees in the planning process.
Building Regulations	No	Part G of Building Regulations steers water performance in all new household development. Water Companies are contributing evidence and advise to the review / strengthening of future changes (Future Homes Standard Hub), however these standards are government controlled, not monitored through post-build inspections and not enforced when the actual water consumption values exceed building regulation targets. Smart meter data is now showing that actual water use in new homes greatly exceeds the intended PCC levels within Building Regulations - impacting demand forecasting and PCC reporting.
Fittings Standards	No	A number of different testing and certification schemes are in place drive some water using device performance. These standards are controlled by government and third-party organisations. Water companies are playing an active role in advocating the introduction of a mandatory water label for water devices/appliances, but do not control the timings or scale of any future water labelling scheme.
Device & appliance performance	No	The performance of all water using devices and appliances sold and installed in the UK is not driven by water efficiency. Currently there is no water label or minimum performance standard for devices. Government is seeking to introduce a mandatory water label in the future. Water companies are advocating the introduction of a mandatory independent water label and minimum standards for water devices/appliances, but do not have a controlling nor influencing capability in what devices/appliances are put onto the market, nor installed in the nation's building stock.
Meter installation	Yes	Water companies are increasing their levels of meter penetration, with some rolling out a smart water meter installation programmes. Through Green Economic Recovery and future AMP investment, the proportion and benefit from smart metering will increase. Smart metering will become the water sector's primary demand reduction capability across the HH and NHH customer base.
Water efficiency activity	Partial	Maintaining and increasing the scope and scale of water efficiency programme for homes and businesses, will be one of the only water company controlled / influencing options from AMP8 onwards. However the largest water efficiency programmes to date are only reach up to 3% of total customer housing stock within an AMP.
Water use behaviours	Partial	The delivery of area-base behaviour change campaigns and engagement initiatives, will have a key role to play from AMP8 onwards. Whilst water company led engagement initiatives will have a role to play in reducing consumption, there will be a need for a more coordinated 'always-on' approach to awareness raising and education at a national level. Behaviour change options include; online water efficiency tools, area-based campaigns, omni-channel customer engagement, cross-sector behavioural change schemes, smart metering engagement and in-home / virtual water efficiency visits)
Pandemic impacts	No	Covid19 has caused the single greatest shift in household water use change. The scale and duration of this water use impact is still unknown. The 3-year calculation methodology for PCC will prolong the impact of Covid beyond the lifespan of the pandemic and associated government restrictions.

Source: Thames Water





## E Usage reduction measured by MI/d water saving can better incentivise water efficiency

- 5.1 To assist the development of AMP8 performance commitments, we have produced an alternative reporting methodology, based on MI/d water saving. This methodology builds on a wide range of water efficiency activities that have been delivered over recent AMPs as part of our demand reduction programme and reported against Water Resource Management Plan (WRMP) targets. We have shared the reporting methodology to Ofwat on 17th June 2022. The MI/d-based water saving metric in PR24 would supersede the current Per Capita Consumption (PCC) method.
- 5.2 We consider MI/d water saving a far more suitable performance commitment metric for the following reasons:
- MI/d measures actual water savings that can be delivered through company-led water efficiency activities (eg. metering, water efficiency). Far greater evidence of measured water savings volumes is now available compared to previous AMP reporting
  - MI/d covers both HH and NHH water savings activities and reporting. This gives water companies flexibility to deliver demand reduction initiatives tailored to their geography and customer base characteristics (eg. type and proportion of business operations). It also enables a single consistent measurement method for common demand reduction activities that are carried out in both homes and business properties (eg. leaky-loos, taps, showers), often by delivered by the same personnel
  - MI/d can be used by both Wholesalers and Retailers when reporting water efficiency results. Using a consistent MI/d metric will enable greater collaborative working between wholesalers and retailers in response to PR24 requirements and in-line with the recommendations from the Retailer-Wholesaler Group's Water Efficiency Sub-Group (RWGWESG)
  - MI/d for usage reduction provides a single consistent measurement and reporting method with Leakage PC metric. This enables a single comparable measuring method for what is the same water supplied through the same pipe
  - MI/d removes the big external non-water company variables that influence traditional PCC reporting, such as; extreme weather, pandemics, govt restrictions, hybrid working practices, building regulations, fittings standards, market forces etc
  - MI/d reporting has precedent. It would be consistent with AMP6 water efficiency PC metrics and is already used as the basis metric for all WRMP modelling and reporting. MI/d is a value generated by WRMP as part of supply-demand balance calc output
  - MI/d is already a standard reporting metric within the Ofwat and Environment Agency annual returns
  - MI/d water savings amounts can be used to better engage customers eg. "we have saved xMI/d from being abstracted from the environment"
  - MI/d is conducive with the increasing penetration of smart meter technology, which is enabling more accurate measurement of actual water volumes. This is enabling a move away from estimating population or occupancy, which significantly reduces the accuracy of demand reduction results, even when water volumes are metered / measured

