Refreshing water tariffs

How to balance reducing demand and maintaining affordability

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SMF Social Market Foundation

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ABOUT THIS REPORT

This report made use of a literature review, a steering group of water industry representatives and original modelling, which used a 'model households' approach to illustrate the potential impacts of alternative water tariffs on a range of constructed household types.

EXECUTIVE SUMMARY

Over the coming decades, the water system in England and Wales is set to face significant challenges. If no adaptation measures are taken to improve our long-term water supply, our demand for water could outstrip supply by as soon as 2036. Not only does demand reduction have crucial environmental implications in the form of preventing over-abstraction of water sources and maintaining ecosystems, but successful demand reduction can free up water resources for economic growth: more efficient use of our water system can allow for new homes and new industrial uses (for example water for data centres).

Meanwhile, although household water bills have consistently fallen in real terms since 2010, the affordability of water continues to be a concern and is likely to remain so given the need to finance extensive investment in water infrastructure. Estimates suggest that, depending on the estimate, at least 1.47 million households experience 'water poverty', conventionally defined as spending over 5% of disposable household income (i.e. after housing costs) on water bills. Moreover, affordability is likely to continue to be a challenge going forward. The regulator Ofwat has approved £104 billion of total expenditure between 2025 and 2030, some of which will lead to increases to water bills in the short term: according to Ofwat, the average combined water and wastewater bill is expected be £157 higher in 2030 compared to 2025, an average increase of 36% before inflation.[1]

The need to secure our water supply for the long term means that investment is very much necessary. However, this will bring challenges when it comes to affordability. The focus of this report is exploring how tariff design can best deliver a system that balances both the need to fund further investment in water infrastructure and also maintain the affordability of water bills for households.

The water pricing system needs to change to reflect the ongoing need for demand reduction while also maintaining affordability for vulnerable households

- Approximately 40% of households are on an unmetered 'rateable value' system, with bills derived from historic estimates of property values. This bears no relation either to water consumption or household circumstances. Although there is a degree of progressiveness given that poorer households are more likely to live in lower rental value properties, since this is based on values from the 1990s this relationship has been significantly eroded over time due to differential growth in house values.
- 60% of households are on metered charges, which generally consist of a fixed standing charge and a uniform volumetric price for water consumption. While this does provide an incentive to conserve water, evidence suggests that consumers are more responsive to prices under alternative tariff structures such as Rising Block Tariffs (RBTs), where the marginal price of water increases according to blocks of usage.
- The standing charge element also has a regressive impact on household finances.
- Bills are set to rise between 2025 and 2030 to fund necessary investment in water infrastructure, which will make maintaining the affordability of water

bills a key consideration going forward. Reducing demand for water is an environmental imperative to prevent over-abstraction and damage to water sources. As the population, and so water need grows, demand reduction now helps to ensure a sustainable water system for the future.

Current household water consumption is poorly understood

- We lack reliable data and evidence on water and consumer behaviour.
- Many water companies are looking at new approaches to charging customers, and are conducting trials of new tariffs. The results of these will help to paint a clearer picture, but it is too soon for these trials to have borne results.
- Understanding these limitations, this report provides a provisional answer on which tariff might work best, based on the evidence that is available.

The effect of prices on water consumption is modest, and so tariffs have to be carefully designed to have maximal impact on water demand

- Price affects how much water is consumed, but demand is relatively inelastic: our best estimates for the UK suggest that an increase of 10% in the real price of water could be expected to lead to a reduction in usage of between 1% and just under 3%.
- However, elasticity is not static and besides non-price interventions such as communication campaigns, factors within tariff design can increase it, including:
  - The type of tariff structure – evidence that elasticity is higher under rising block tariffs than under uniform pricing tariffs.
  - The salience of water prices e.g. through billing frequency or price information.
  - Higher elasticity in the long run than the short run as consumers adjust to a tariff structure.

Principles underpinning successful tariff reform

- To maximise elasticity and therefore meaningfully contribute to demand reduction whilst maintaining – or at least not worsening – affordability, a water tariff structure should be:
  - **Progressive** in its distributional impacts, with better off people paying a proportionally higher share of their income on water bills than worse off people, relative to the water they consumer.
  - **Targeted at discretionary water use.**
  - **Salient,** making consumers conscious of the price of water, to create a clear economic incentive to moderate consumption in a way that is simple to understand.
  - **Persistent** i.e. in place over the long term to enable consumers to adapt.

The optimum tariff scheme for both demand reduction and affordability is likely to be a Rising Block Tariff (RBT)

- There are various tariff options, but no one scheme can provide all the answers. The table below gives an overview of the main types of tariff we explore in this report with their strengths and weaknesses assessed against our criteria (excluding persistence, which is mostly relevant to implementation rather than design).

Tariff type	Definition	Progressive	Targeted	Salient
Uniform pricing tariffs	Water is charged at flat rate per litre	Flat rate tariffs are not designed with progressivity in mind, additional measures are usually needed to help high-use but low income households.	Flat unit price makes for unclear/weak price signals to reduce discretionary consumption.	Easily understood by consumers. Even the introduction of "dumb" metering can result in decreased usage.
Time of use tariffs	Water is charged at a higher rate at particular times of day or in response to reservoir levels	Prices are calibrated to reflect conditions in the water system such as reservoir levels rather than household circumstances.	Real-time pricing is targeted very precisely at water usage when it will put the most pressure on the water system.	Accurately reflects cost of supply, but complicated to communicate. Less suitable where reservoir levels are not under significant pressure.
Seasonal tariffs	Water is charged at a higher rate during the summer months	Designed more to achieve demand reduction in warm months rather than ensuring a progressive impact on households.	Seasonal tariffs on their own are not necessarily tied to usage. But they can be combined with other tariffs to target discretionary use more effectively.	The logic of seasonal tariffs is easy to communicate to water users, and can result in noticeable reductions.
Rising block tariffs	Water is charged in blocks, with price per unit increasing with each block	The first block can offer a low price. But high consumption households are not always high income households, so careful adjustments need to be made.	RBTs can be designed so that the highest blocks coincide with discretionary levels of water use.	RBTs give a strong, easily communicated signal to consumers to manage their water use.

Modelling of tariff options suggests an RBT could be well placed to target bill increases on the highest users

- We have conducted 'model households' analysis to explore the likely impacts on different household types of alternative tariff options.
- A modified flat rate tariff with no standing charge, seasonal tariffs and RBTs can all lower bills for low use households.
- An RBT seems likely to be best placed to target large bill increases precisely at high use households without entailing significant bill increases for households with average or low water use.
- Demand reductions from an RBT are difficult to model, since households have multiple marginal prices they could respond to. However, if households respond to average prices it could result in modest demand reductions focused at the high end of water usage.
- Given the fact that the presence of children and teenagers can raise a household's consumption, there is a risk that large households and those with children disproportionately lose out in most scenarios. Any RBT will have to be adjusted for household size to protect these households against

unsustainable bill increases, and the case for social tariffs is likely to be strong even after a move to a new tariff structure.

A number of practical challenges will need to be overcome to move to a fairer and more effective tariff system

- Technological constraints like low water meter penetration, and even lower smart metering penetration makes any programme of tariff reform more difficult, as it limits the available tariff options. A RBT cannot be fully implemented without universal metering.
- Obtaining an accurate picture of household occupancy and circumstances is also challenging, especially to administer an RBT. Other countries make use of a centralised 'national register', but in the absence of this we identify several alternative strategies:
  - Harnessing and extending data sharing powers under the Digital Economy Act 2017 to combine information on household income, benefits and water bills.
  - Make use of smart meter data to estimate occupancy.
  - Calculate tariffs initially based on a 'default' household size to reduce administrative difficulty. This approach is used in many cities where there is an RBT in operation.
- The regulatory environment also creates barriers to reform.
  - Ofwat's Revenue Forecasting Incentive (RFI) mechanism should be adapted, as alternative consumption-based tariff structures are likely to lead to more volatile revenues and because the RFI mechanism financially penalises revenue volatility it will deter innovation and change.
  - It is unclear how well new tariffs, once fully implemented, would satisfy current charging principles around cost reflectivity under Ofwat's charging rules. This uncertainty needs to be addressed.

Recommendations

- Government should end the use of Rateable Value as a means of charging for water, and introduce compulsory metering for all areas, not only water-stressed areas, with smart meters as the default.
- Ofwat should review the Revenue Forecasting Initiative, which is a regulatory instrument used to incentivise accurate forecasting of revenues and cost recovery with financial penalties for under/over recovery, with a view to minimising potential penalties on water companies for adopting tariffs with higher revenue volatility.
- Update the charging guidelines, particularly the current principle 11c, to better reflect the possibility of volatility and/or non-cost-reflectivity (meaning the relationship between tariffs and cost of supply would be loosened to facilitate more innovative approaches) in new tariff designs and provide water companies with greater clarity on how a move to new tariff structures will interact with principles on bill stability.

- Amend the cost reflectivity principle to more explicitly allow for differences in pricing between higher and lower water users and to allow for different marginal pricing under different conditions or times.
- Encourage water conservation practices through targeted information campaigns and billing.
  - Government, water companies and environmental organisations should work together to co-design a national campaign aimed at encouraging individuals and households to use less water. This would present a united, national campaign on water conservation.
  - Billing frequency should be increased to maximise household responsiveness to water price changes.
  - The design of bills should integrate behavioural insights to maximise conservation by integrating information on per household consumption, tips on reducing consumption, and explicit information about the marginal price households face.

CHAPTER ONE – INTRODUCTION

The challenges facing water providers

When setting tariffs for water and wastewater services, water providers must walk a tightrope, balancing numerous economic, social and environmental objectives. Besides the obvious economic challenge water providers in England and Wales face, of recovering the full costs of service provision, the unique nature of water adds complexity and trade-offs.

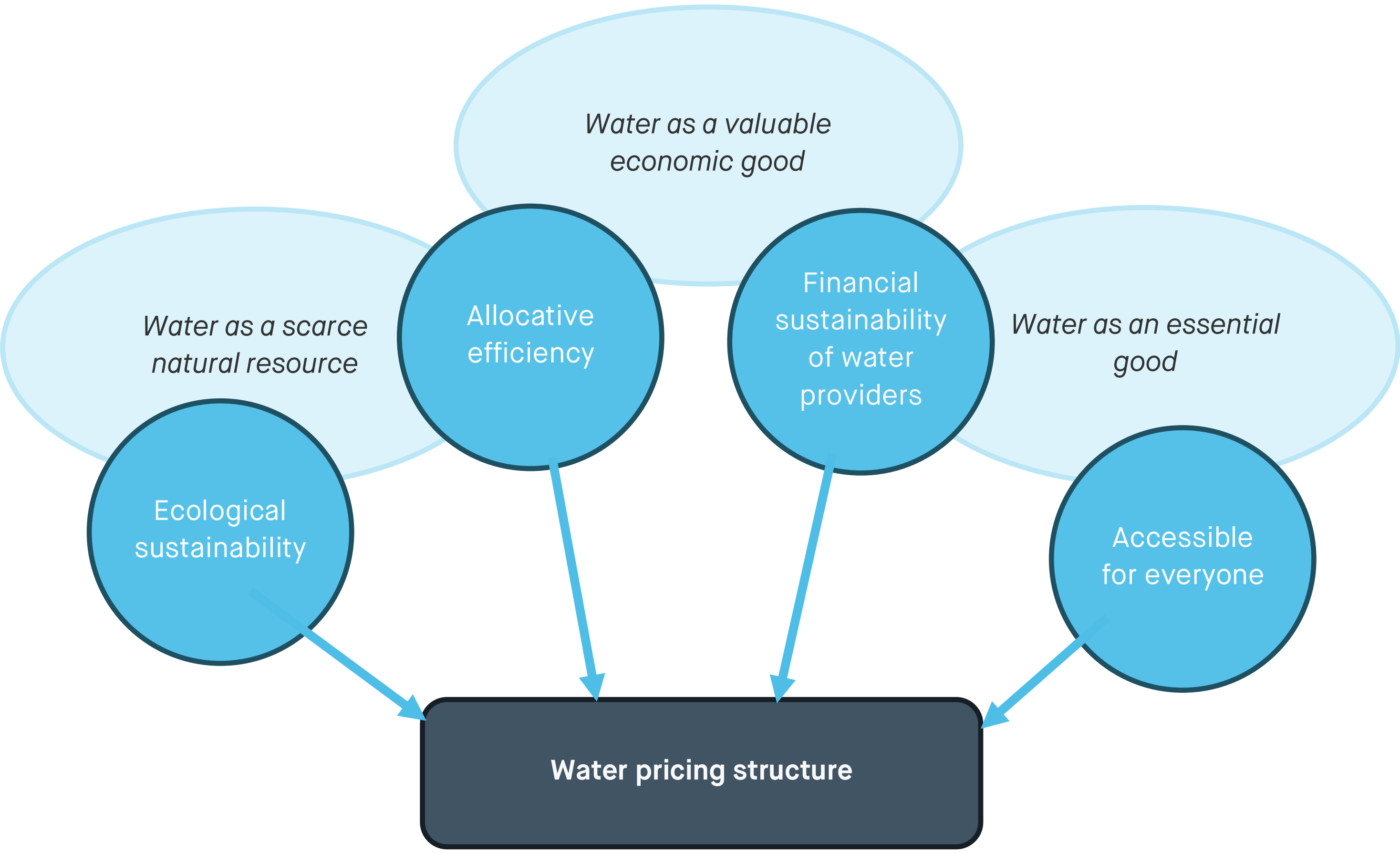
Firstly, the role of water as an essential good suggests that providers should ensure to the greatest extent possible that it is affordable for all. To say water is essential may be stating the obvious, however, how to respond to this fact is less obvious. In England and Wales, the typical response to ensure water is accessible to all is, first and foremost, ensuring that by law nobody can have their water supply turned off, and secondly to implement 'social tariffs' – discounts or bill caps aimed at a subset of financially vulnerable households to improve the affordability of their water supply. Other jurisdictions, such as South Africa[2] or Belgium[3], have responded by providing a basic allowance of water at a subsidised or, in some cases, free rate.

Water is also a scarce natural resource, which means that ecological sustainability is of paramount importance: making sure that water is used responsibly and sustainably is vital to maintain a sufficient water supply and avoid a catastrophic "Day Zero" scenario where water supply runs out, as has nearly happened in Cape Town, South Africa in recent years.[4] Ensuring sustainability in this way is also important for more than avoiding running out of water. There are also important environmental aspects around making sure vulnerable sources of water are protected from over-abstraction, which can result in declining river levels, reduced water quality, alongside disruption of wetlands and aquatic ecosystems. And there are important economic considerations as well: lower, or more efficient, water use among households means water availability becomes less of a barrier for pro-growth measures, such as the building of new homes, data centres, industrial sites and so on. As such, many water pricing structures across the world aim to provide signals to consumers in order to incentivise a 'rational' or 'sustainable' level of water consumption.

Recognising water as both scarce and valuable also suggests allocative efficiency as an objective for water pricing. In the short term, this can be viewed as aiming for an economically efficient allocation of water among its various potential uses to maximise its value. A broader view of allocative efficiency suggests that water should be allocated to uses that will not only benefit society today but maximise benefits to society in future as well.[5] An example of this thinking in action is in Australia, where there is a market to trade water rights under which water holders can buy or sell their right to use water, either on a permanent basis (by selling the water entitlement to a share of the water system) or on a temporary basis (by selling part of one's allocation of water for that season).[6]

These numerous priorities make pricing water a complex endeavour with multiple objectives. Water tariff structures must enable cost recovery for the provider but also its wider obligations to vulnerable households and the environment. A graphic representation of these objectives is shown below.[7]

Figure 1: The objectives facing water companies when setting prices



Reflecting upon the different strategic imperatives water companies must weigh begs the question – how is the UK currently faring against these objectives? And what are the policy implications that flow from the UK's current position?

Water pricing in England and Wales

Since 1989, water systems in England and Wales have been fully privately owned. Some companies are responsible for the provision of both water and sewerage services, while others are solely responsible for water services, with sewerage then taken care of by one of the companies that do both. In Scotland and Northern Ireland, water services were never privatised, and provision remains the remit of the state, although water provision in these parts of the UK is beyond the scope of this report.

England and Wales do not have mandatory metering of households. All houses built since 1990 must have a water meter fitted, however even with that mechanism in place, meter penetration is only at around 60%.[8] For houses built prior to this date, there is usually no obligation to have a meter installed. Water companies can be compelled to consider compulsory metering as part of producing their water resources management plans, but only if the government specifies a water company's region as 'seriously water stressed' – i.e. where the Environment Agency believes there are or, are likely to be, environmental impacts caused by public water supplies or the need for major water resources developments. The government extended the designation to 15 company areas in 2021.[9]

Approximately two fifths of households do not have a meter installed, which affects how water is charged. Even where meters are installed, usually they are not smart meters – only an estimated 12% of households in England have smart meters- and so must be manually read. [10]

How water is charged depends on whether or not a household has a meter installed. Firstly, metered customers tend to pay a standing charge, intended to cover the costs of reading and maintaining meters to water companies.

Metered customers are then charged for their consumption, usually calculated at a flat rate per cubic metered of water consumed. Properties that have requested a meter but cannot have a meter installed (e.g. it is too difficult, or it is not practical) must be given an assessed usage bill, calculated on factors – which vary between different water companies – typically including the number of bedrooms in a property, the type of property or the number of people who live there.[11]

Most unmetered properties are charged on the basis of the "rateable value" (RV) of the property. This is an assessment based on the annual rental value of a property, last updated in 1990.[12] Factors like the property size, condition and availability of local services were used to calculate the RV, and do not reflect how an area or a property may have changed since 1990 and of course have little relation to water consumption. Both the fixed charge, and the calculation for how RV is determined can vary significantly depending on the water provider. This means that two houses a street apart could have the same characteristics in terms of water usage, or used to calculate RV, but could experience vastly different water bills because they are supplied by different water companies. Given regional differences in demand and degree of water stress, having a national rate that water is charged at would make little sense, but it does mean that bills can be the victim of a postcode lottery.

All water companies also offer a social tariff.[13] Social tariffs offer a discount on bills, or a lower rate of charging, so that households who might otherwise have difficulty paying their water bill can afford it. However the current design of social tariffs has been criticised by a number of organisations including the Consumer Council for Water,[14] a coalition of charities which called for a single social tariff in an open letter in August 2024, and more recently by the Social Market Foundation.[15] Social tariffs are not always well targeted to reach those most in need or lift households out of water poverty.[16] Additionally, eligibility criteria for social tariffs and the bill reduction that stems from this are not consistent across water companies. The CCW has recently reiterated its recommendation of introducing a single social tariff across all water providers in order to alleviate the current 'postcode lottery' arising from differing schemes.[17] The single tariff would have the same eligibility criteria across all providers, and funding, rather than being on a company by company basis, could be centralised with a single funding pot.[18] Until recently it was not possible to share the costs of providing special provision across water companies. However, terms introduced through the Water (Special Measures) Act can “allow costs associated with making special provision in charges schemes to be shared across companies”.[19] This could make organising and financing a single social tariff more realistic.

In 2009 the Independent Review of Charging for Household Water and Sewerage Services in 2009 (the ‘Walker Review’), highlighted issues with the water charging system. The review raised concerns that the mixed charging system (where some households are charged on RV, and some are charged based on their meter) was poor from both a water efficiency and an affordability and fairness perspective.[20] It also raised concerns about the long-term efficiency of the system and its ability to cope with anticipated population growth.[21] These questions and concerns remain. At the time of writing, water companies are coming under increasing pressure to invest more in the water networks. The investment programme approved by the regulator Ofwat for water companies is £104 billion over 2025-30, which marks more than a two-thirds increase compared to the amount of investment agreed in the last regulatory period. From a consumer perspective the cost of living crisis continues to hit, and demand for water is increasing. The combination of expected population growth, house building, higher water consumption and climate change risking the sustainability of water sources, point to the need to reduce consumption sooner rather than later. For water companies and policy makers, there is a question to answer on which objectives are the priority, as well as what could be done to achieve them.

The current water pricing system is struggling to meet the objectives of demand reduction and affordability

Demand reduction is an imperative for future water supply, availability and sustainability

Reducing demand for water is not only an environmental imperative but is necessary for ensuring the sustainability of water supply in the long term. Between October 2022 and March 2024, England recorded its wettest 18 months on record. But despite this, water shortages in the UK have been described by the National Audit Office as an “impending risk”.[22]

Households in England and Wales consume an estimated 840 billion litres of water a year, or an average of 146 litres per person per day.[23] This rate of consumption has grown by more than 60% since the 1960s, putting the UK at the higher end of water consumption in Europe.[24] Supply is further stretched by leaks in the system, hotter weather and persistent drought.[25] At the same time, projected population growth means household demand for water is expected to continue to increase. Our long-term water supply is coming under significant pressure, with forecasts indicating that by 2050 the UK’s demand for water could outstrip supply by nearly five billion litres of water a day.[26] If no adaptation measures are taken, our demand for water could even exceed supply as soon as 2036.[27] Even before demand overtakes supply, the stretch on our water resources could lead to much lower drought resilience, greater use of hosepipe bans, difficulty building new homes and various other problems.

Unsurprisingly then, reducing demand is a key water objective, both for central government and for the water companies themselves. That being said, demand can only be reduced so far. A certain level of water consumption is essential, in that it is needed for drinking, cooking, hygiene (bathing and laundry) and sanitation. However, there is not an agreement on what constitutes “essential” usage in England and Wales. Nevertheless, in the Plan for Water, the government at the time set a target of reducing per head consumption (based on 2019-20 levels) in England by 20% to 122 litres per person per day by 2038, and to 110 litres per person per day by 2050.[28] Some water companies have further reduction targets: Southern Water, for example, is aiming for a reduced consumption target of 100 litres per person per day by 2040.[29] Reducing demand to the desired level is not without its challenges, not least because the public are largely unaware of just how much water they consume. Polling from 2022 found that two thirds of Britons thought they used 69 litres of water a day, less than half of average daily use.[30]

Affordability is also a key concern

At the same time affordability remains a key concern. In 2019 water companies in England adopted a Public Interest Commitment to “make bills affordable as a minimum for all households with water and sewerage bills more than 5% of their disposable income by 2030 and develop a strategy to end water poverty.”[31] Ensuring that bills are affordable does not necessarily mean that no household should ever pay more than 5% of its disposable income on water bills. But while it is challenging to identify whether a customer finds their bill affordable, we can assume that households that pay more than 5% of their disposable income on water bills (the ‘5% threshold’) may struggle to pay their bills.[32] Looking at the number of households in this situation in England and Wales, challenges are likely to remain in making sure that water bills are affordable – particularly with the large increase in investment from 2025 since the initial commitment was made in 2019. A 2021 study using 2018-19 data to simulate water poverty incidence in England and Wales estimated there to be 1.47 million households above the 5% threshold of water poverty on an equivalised income basis.[33] This translates to 6.5% of households reaching the 5% threshold across England and Wales.

Our analysis of data from the 2021 edition of the Living Costs and Food Survey, which measures household expenditure on a range of consumer items, suggests that there may be around 1.75 million households in England and Wales who spend more than 5% of equivalised household income[i] on water bills.[34] This represents approximately 6.9% of households in England and Wales according to the survey data.

[i] ‘Equivalised income’ adjusts income for household size by adding a multiplier to the raw income figure. Here we have used the OECD Equivalence scale. This scale assigns a multiplier of 1.0 to the first household member aged 14 or over; an additional 0.5 to each household member aged 14 or over; and an additional 0.3 to each child under 14 years old.

To calculate this figure, we used information on household equivalised income based on the OECD scale[ii] and annualised survey data on the household's last net water charges payment.[iii] We then created a binary variable to assign water poverty at the 5% threshold, before using the survey weighting factor to estimate the number of households in water poverty (in other words, a score of 1 on our binary variable for water poverty was then multiplied by the survey weighting factor).

The discrepancy between our estimates of water poverty from the LFCS and those of the study described above may arise in part due to the use of a different data source. Furthermore, while both approaches are 'top down' – in that they use assumptions about which households are likely to be water poor, rather than determining whether each household is – there are differences in the geographical granularity of estimates: the previous study made estimates at the level of Lower Layer Super Output Areas (LSOAs) whereas our approach used national-level statistics and did not break estimates down further.

Water poverty is (unsurprisingly) more prevalent among lower income households, as shown below in Table 1. Water poverty is indeed very rare among higher equivalised income deciles, and in some income deciles LCFS data does not show any households in water poverty at the 5% benchmark.

Table 1: Incidence of water poverty at 5% level by equivalised income decile.

Equivalised income decile (OECD scale)	Estimated number of households in water poverty (5% threshold)	Proportion of decile group in water poverty
1 (poorest households)	1,227,155	50.1%
2	207,068	8.4%
3	66,334	2.7%
4	72,104	2.8%
5	12,281	0.5%
6	34,423	1.4%
7	-	0.0%
8	-	0.0%
9	-	0.0%
10 (richest households)	-	0.0%

[ii] In the LCFS survey this is coded as variable 'EqIncDOp'. This variable itself is derived from normal household disposable income (variable p389), i.e. gross income less taxes and National Insurance.

[iii] This is coded as variable 'B050', representing the household's last net payment of water charges. This is based on asking households how much they last paid for water charges.

Source: SMF analysis of LCFS. Outliers, defined as cases where household spending on water was over 3 standard deviations away from the mean, have been excluded. Proportion of decile group in water poverty is the proportion of households within that decile group in England and Wales (excluding Scotland and NI) who meet or exceed the 5% income benchmark.

The future needs of the water sector also suggest that water bills will have to rise substantially over the coming years. As referred to earlier in the chapter, water companies are due to invest a total of £104 billion in water and sewerage infrastructure between 2025 and 2030.[35] This investment - which includes proposals to build nine new reservoirs and cut leakage by over a quarter by 2030 – will be vital in addressing the challenges the UK faces on water supply outlined above. However, implementing this will require increases to water bills. Average water and wastewater bills are due to rise to £603 in 2025-26.[36]

This presents an obvious challenge to the goal of minimising water poverty.

Changes to the tariff structures could help better balance these objectives and principles

Given that these factors figure into how water pricing structures are determined, it stands to reason that changes to the tariff structure could help to achieve the objectives of affordability and demand reduction.

Tariffs can be used to help with affordability by targeting support at households who are less able to pay, such as by setting a specific tariff for those on lower incomes. This may be through a social tariff on all water consumed, or providing a certain amount of water for free.[37]

Tariffs can also be used to reduce demand for water services: charging based on consumption has been shown to have a tangible effect on demand. Those who are charged volumetrically for water (i.e. for the water they use) tend to consume less water than those who are not, effectively because there is a financial penalty on excessive water consumption.[38] Research from 2018 claimed that metered properties in England and Wales consumed 266 litres a day compared to unmetered properties who consumed 379 litres a day.[39] The most recent comparison indicates that customers with a water meter consume 126 litres of water per person per day, compared to 177 litres for those who are unmetered.[40] However it should be noted that where meter installations are optional, households who have chosen to have a meter installed tend to have lower levels of consumption already, while households with very high water consumption are less likely to opt to have a meter.[41] As such the real reduction in consumption if all households were metered may be lower than these numbers indicate. We also note that increased metering and a change in tariffs may help reduce consumption, however these factors alone are unlikely to be sufficient for demand reduction on the scale that is needed. To reduce consumption to the necessary levels, pricing mechanisms will likely need to be paired with information campaigns and water saving appliances.

CHAPTER TWO – OPTIONS FOR REFORM

If we are facing a difficult road ahead on both water usage and affordability, then the current unmetered 'rateable value' tariffs that cover approximately 10.6 million households[42] represent the worst of both worlds. Since neither the fixed charges element nor the rateable value element are connected to water use, there is no economic incentive whatsoever to moderate water use. Moreover, households on unmetered tariffs are more likely to face affordability challenges than those that are metered. One 2020 study found that "metered households are only three-quarters as likely to be water-poor as households charged [using] rateable values".[43] For the 60% of households on metered charges, tariffs have a greater connection to water use and conservation. However, these 'flat rate' charges, which comprise a standing charge and single volumetric price for water, are one among a wide variety of options for how to structure water tariffs, which this chapter will discuss.

Different countries already use a variety of alternative tariff structures

Around the world there is no universal approach for charging for water. Different countries and jurisdictions make use of a range of tariffs and approaches to charging for water.

As detailed in Table 2 below, rather than a flat rate per cubic meter of water, charges can be banded, with the cost rising in line with blocks of consumption, known as a rising block tariff (RBT)[iv]. The decision of how many blocks (there can be as few as two) as well as how much water is in each block, is decided on by the water provider. RBTs can be found across the world but can vary greatly in their application. In some parts of South Africa and in Manila, in the Philippines, for instance, the first block of water is provided for free.[44] In other countries the first block of water is provided at a lower "essential use" rate. In some Spanish cities there are as many as five different charging blocks.[45]

Another alternative is to introduce "time of use" tariffs, where water becomes more expensive at certain times, like early morning when demand is highest.[46] Real-time tariffs can change the cost of water when for example, supply is more strained. This is used in Sydney, Australia when reservoir levels are lower than 60%.[47] Seasonal tariffs mean that water is charged at different rates at set points of the year. Usually there is a higher rate during the summer months when demand is typically higher and abstraction is typically more expensive.

Table 2: Different types of water tariffs found around the world

	Description	Purpose/aim	Examples
Rising block tariff (RBT)	Water consumption is charged in blocks; a certain amount of water deemed essential is charged at a lower rate, as	Demand reduction, affordability (possible to pursue	Athens, Seville, Los Angeles, San

[iv] The term increasing block tariff is also commonly used

	discretionary use increases, so too does the amount of water charged. In some cases the first block, e.g. that deemed for essential use, is free.	both objectives simultaneously)	Diego, Tokyo, Singapore
Seasonal tariff	Water is charged at a higher than standard rate in the summer or a lower rate in the winter	Demand reduction	Cities in Chile
Peak-load pricing	Water is charged at a higher rate at times of day when demand is highest demand, such as early morning or mid evening.	Demand reduction	
Critical peak pricing	Water is charged at a higher rate on select days of the year when consumption may be expected to be extra high, such as during special events.	Demand reduction	
Real time pricing	The price per m^3 of water fluctuates in real time depending on a set of measurable parameters. e.g. price is based on reservoir levels, when the reservoir is below a certain level, the price of water increases to a higher rate	Demand reduction	Sydney
Social tariff	Water is charged at a lower rate for particular households, such as those on lower incomes. Sometimes this tariff is subsidised by placing higher charges on households with higher incomes.	Affordability	UK, Belgium

Trials are underway to investigate how tariffs could be changed in England and Wales

As described previously, much of the current water charging structure in England and Wales does not show a strong commitment to either affordability or demand reduction. Metering has some effect on demand reduction but a unidimensional volumetric tariff – i.e. a flat rate that has no adjustment for factors such as household size, medical needs etc – could compromise affordability as a result of not reflecting characteristics which could lead a household to spend a high proportion of its income.[48] Large families or households with higher consumption due to medical needs are more likely to struggle with the affordability of a single volumetric tariff that takes no account of their circumstances. For unmetered households, the RV billing system is both outdated and not designed with affordability in mind, and there is little in their bill that incentivises saving water.[49] Every water company currently offers a social tariff which can help to improve affordability, but what this means and who is eligible also varies by company.[50]

In 2022 the water regulator Ofwat called on water companies to look at new approaches to charging customers that would address the dual issues of affordability and meet environmental goals (such as reducing demand).[51] Some companies have already launched their trials, while others have plans to launch in the coming years. As summarised in Table 3, the focus of the trials is a mix of demand reduction and improving fairness and affordability. Some are explicitly targeting demand reduction or affordability, while others are trying to blend the two aims.

In existing trials, RBT is a popular tariff type, but with variation between them in terms of which objective is prioritised. Affinity Water have started to trial an RBT, with a primary focus on affordability.[52] As part of the trial customers first block of water is free, with second and third blocks of usage progressively more expensive. South West Water is trialling a three block RBT which aims to both make bills fairer, and reduce discretionary water use.[53] Participants will pay below the standard rate for essential water use, the standard rate for "standard use", and a much higher rate for "excessive use".[54] South Staffordshire Water's RBT is strongly focused on affordability, with eligibility focused on those who struggle with their bills but do not qualify for their social tariff. Participants will receive the social tariff for the first block of usage (essential usage). The second block is then charged at the existing standard rate.[55]

Table 3: Planned and existing water trials by water companies in England and Wales

	Trial type	Aim	Dates
	Trials in 2024/25		
Affinity Water	RBT	""gather evidence on the effects of the new tariff on affordability and demand response"	October 2023-2025[56]
South West Water	Seasonal tariff	"reflect the higher cost of peak summer demand andencourage customers to use less water in the summer months"	October 2024 - 2026[57]

Anglian Water	Seasonal tariff	"our focus is on water efficiency, helping customers to value water more, use less, and so reduce the need for future bill increases"	April 2024 – April 2026[58]
South Staffordshire Water	RBT for essential use for struggling households[v]	To provide financial support for households not eligible for the company's social tariff	April 2024 - 2025[59]
United Utilities	Reward/incentive scheme RBT	to "offer strong water efficiency incentives for metered household customers"	2024-25[60]
Southern Water	Seasonal tariff, RBT	"" seasonal or rising block tariffs which could reduce average bills by 10% when fully implemented…We expect these to incentivise customers to become more efficient"	2024-25
	Trials planned for 2025-30		
Thames Water	Three block RBT	"will reduce bills on average by 9% for three quarters of our households while creating incentives to be more efficient with water consumption"[61]	2025-26
Severn Trent Water	RBT	"test the merits of low unit rates for essential water use with higher unit rates for discretionary use"	2025 to 2030
Welsh Water	RBT	"establishing the impact of this tariff structure on usage for 'light' and 'heavy' water users, and to identify what	2026-7

[v] Eligible households are those whose income exceeds the threshold for the Assure social tariff but still struggle to pair their water bills

		mitigations might be needed to avoid unintended consequences."	
Hafren Dyfrdwy	*Trial type undecided, plan to "act as a fast-follower of successful trials elsewhere in the sector"*	*Aim(s) not mentioned*	n/a
Portsmouth Water	Higher essential use allowance for disabled households; Peak pricing	Better reflect higher essential use for vulnerable customers; provide opportunities for customers to save money over specific 'spot times'[62]	By 2030
Wessex Water	Increased smart metering, leading to more tariff trials in future	Looking to "create tariffs that provide the right incentives for customers"	By 2030
Yorkshire Water	A charging trial I the 2025-2030 regulatory period *(Trial type undecided)*	Further support affordability	n/a
Northumbrian Water	RBT, caps on bills for high occupancy households and on households with high medical needs, peak pricing	Supporting efficient water usage, enhancing social equity, incentivising reduced demand at peak times	By 2030

Source: Ofwat

Anglian Water and United Utilities meanwhile are prioritising demand reduction. Anglian Water are trialling seasonal tariffs, with summer water usage (May- August, inclusive) charged at a higher rate than the remainder of the year. United Utilities are opting for reward schemes that incentivise greater water efficiency, through methods such as fitting a water meter or installing a water butt. Participants will be entered into a lottery and can win a year's worth of water credit.

For future tariff trials, RBT remains the predominant tariff, but not all companies have indicated what tariff they will use yet. Many of these companies do not yet have a confirmed water tariff trial but are planning to increase their smart meter penetration and introduce trials after that point. For trials that are currently underway at least, only Anglian Water are explicitly using smart meters as part of the trial; it is likely that almost all other trials are using 'dumb' meters due to the relatively few smart meters currently installed in England and Wales.

Tariffs can contribute to demand reduction – but we should be careful about relying on them too heavily to do so

In response to the challenges detailed above, it is worth considering what existing evidence suggests tariff reform could plausibly do to address these challenges, particularly on demand reduction.

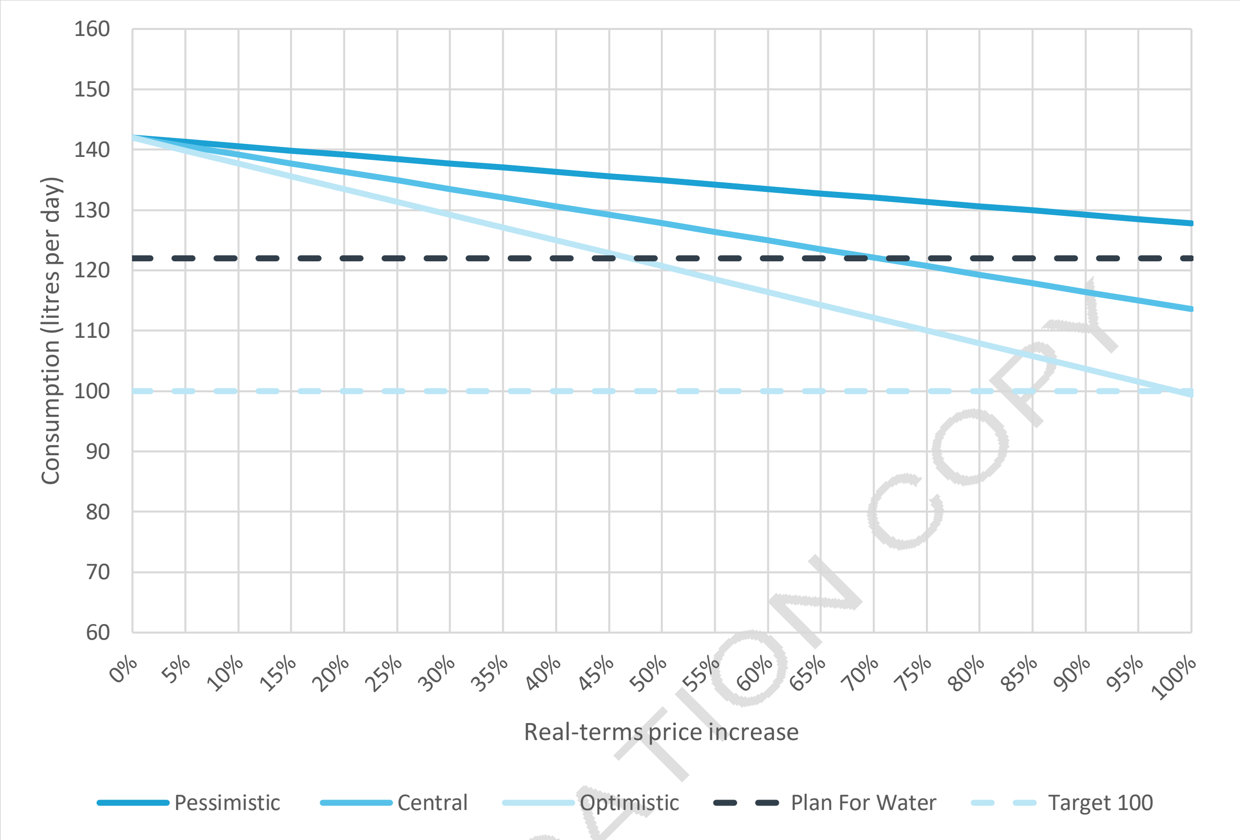
Various estimates have been made on the price elasticity of demand (PED) for water. While price is a significant factor in predicting how much water is consumed, demand is in general inelastic, meaning that each unit of increase in water price leads to a less than proportionate decrease in consumption. Numerous studies of European countries put the PED of water in the -0.10 to -0.26 range.[63] There is comparatively little evidence for the UK specifically, but figures from two papers from 2010 and 2015 estimating PEDs in the UK range from -0.177 to -0.286.[64]

To put this figure into context, there are a number of goods with considerably higher price elasticity. Alcohol can have price elasticities ranging from around -0.5 for beer to -0.78 for products such as spirits.[65] Price elasticity for fuel used in transport can be around -0.5.[66] Even among some goods that would be widely understood to be essential, price elasticity can be higher than that for water: in the UK, the long-run price elasticity of residential electricity was estimated at around -0.6.[67] It should be noted, however, that the price elasticity of water is not uniquely low. For example, estimates for the price elasticity of domestic gas have ranged from -0.1 to -0.28, reflecting a broadly similar level of price elasticity to that of water.[68]

While PED estimates in the literature vary widely, this suggests the effect of price increases on water consumption is likely to be noticeable, but small. On the basis of these estimates, an increase of 10% in the price of water could reasonably be expected to lead to a reduction in water consumption of anything between 1% and just under 3%. This is not nothing, but it pales in comparison to the targeted reduction to 122 litres per person per day, or a 15% reduction of water consumption set out in the previous government's Plan for Water.[69] On current PED estimates for the UK, even the 26% average increase for water bills from 2025-26 recently announced by Ofwat would be unlikely on its own to achieve the levels of demand reduction that the UK government and water companies have set as targets.[70] Under these plans Ofwat only expects a reduction in per capita water consumption of 6% between 2024-25 and 2029-30.[71]

Figure 2 below illustrates the challenge by showing how the average personal consumption per day (142 litres) could change under a range of different PEDs, assuming that price elasticity is linear: an 'optimistic' scenario reflecting a PED of -0.3, a 'central' scenario of -0.2 and a 'pessimistic' scenario of -0.1. Even under an optimistic assumption that the 'true' PED of water in the UK is around -0.3, it would take a roughly 45% increase in the real price of water to achieve the Plan for Water target of 122 litres per day of consumption by 2038.

Figure 2: Per capita water consumption in litres per day under different price elasticity scenarios



Source: SMF analysis

This is, admittedly, a simplification. The PED estimates discussed above describe the response to a rise in the *overall* price of water. But there is evidence that the type of tariff and degree of consumer engagement also have an influence on PED.

Elasticity estimates tend to be higher under rising block tariffs than under a uniform pricing structure.[72] One explanation of this is that the structure of RBTs encourages households to be more aware of their level of consumption than uniform pricing because of the jump in marginal price between blocks. Furthermore, evidence suggests that price sensitivity is higher in the long run than in the short run.[73] This makes intuitive sense, as after a period of adjustment households are likely to have a better understanding of the implications of the new tariff structure and how this interacts with their own consumption patterns.

There are further sources of variation in how consumers respond to water prices. One is seasonality. For residential water use, international evidence suggests summer demand is more elastic than winter demand and outdoor demand is more elastic than indoor.[74] Indeed, consumption in the UK varies seasonally, with higher water usage in summer months.[75]

It is also possible that over time, structural changes in attitudes to water conservation may be taking place to make consumers more sensitive to water prices. The increasing salience of climate change – which 7% of voters identified as a top issue facing the country in 2011 compared to approximately 20% today - may play a role in shaping attitudes to water consumption. [76]

Tariffs can, then, contribute to demand reduction. Current evidence around the implementation of other tariff structures such as RBTs further suggests that current PED estimates for the UK may understate the impact of moving to a new tariff structure. However, even in this scenario the price rises needed to make a substantial impact on demand and bring consumption into line with policy targets may be so large as to be politically unfeasible. In the short term, this is especially the case following a fall in living standards of 4.3% in 2022-23 and 2.8% in 2023-24, the former of which was the largest fall since 1956-57.[77]

Principles of reform

In order for a tariff reform to maximise elasticity and therefore be successful in meaningfully contributing to demand reduction whilst maintaining – or at least not worsening – affordability, evidence suggests that a water tariff structure should be:

- **Progressive**. The situation on affordability is likely to be challenging whatever tariff reform is adopted. However, this makes protecting the most vulnerable households from unsustainable price rises a crucial consideration. A new tariff structure should aim to reflect this in its distributional impacts by being at least somewhat progressive, with lower charges for lower income households, and higher charges for bigger earners.
- **Targeted at discretionary water use**. Related to the above principle, a tariff structure should aim to target discretionary use and limit the impact on essential use of water. Discretionary use would be considered to be anything over the estimated average water usage in litres per person per day, who does not have an increased water need (e.g. for health reasons)
- **Salient**. To maximise responsiveness to prices, the structure of the tariff itself should provide a clear economic incentive to moderate water consumption and be simple to understand for water users. There are additional considerations around the implementation of a tariff to increase salience, such as presentation of price information on bills, billing frequency, use of smart meters and so on, which can all make it more likely that consumers are conscious of and thinking about the price of water.
- **Persistent**. In order to be maximally effective, a new tariff structure should be in place over the long term. Of course, this does not preclude adapting elements of the tariff to circumstances – for example using seasonal pricing during periods of drought – but the basic structure should remain stable as much as possible.

The table below sets out our assessment of how well various options for tariff structures meet these objectives (excluding persistence, which is mostly relevant to implementation rather than design). Green indicates that the option performs well on this metric, yellow indicates that this option could perform well or badly on this metric depending on specific design choices, while red indicates that the option is not typically suited to meeting that objective.

Table 4: Different types of tariff structures and how they fit with principles of tariff reform

	Progressive	Targeted	Salient
Flat rate / uniform pricing tariff	Flat rate tariffs are not designed with progressivity in mind, additional measures are usually needed to help high-use but low income households.	As higher consumers will pay more for water, can be effective at targeting discretionary usage, however the fact it is charged at the same rate as other levels of usage makes this signal unclear.	The less water consumed, the lower a water bill will be, a message that is easily understood by consumers. Even the introduction of "dumb" metering can result in decreased usage.
Rising block tariff (RBT)	The first block can offer a low price. But because high consumption households are not always high income households, careful adjustments, such as accounting for household size, need to be made to ensure an RBT is progressive.	RBTs can be designed so that the highest blocks coincide with discretionary levels of water use.	RBTs give a strong, easily communicated signal to consumers to manage their water use. There is evidence that they achieve this better than uniform pricing.
Seasonal tariff	Seasonal tariffs are designed more to achieve demand reduction in warm months. They are not typically geared to ensuring a progressive impact on households.	Seasonal tariffs on their own are not necessarily tied to usage. But they can be combined with other structures, such as an RBT, to target discretionary use more effectively.	The logic of seasonal tariffs is easy to communicate to water users, and can result in noticeable reductions.
Peak-load pricing	Peak load pricing is more focused on reducing demand at specific times of day or on particular days, irrespective of income or household circumstances/needs	Charging households more at peak times may reduce some consumption at peak times, which is not made up for later on.	If peak load is consistent for all households, e.g. water is more expensive between 06:00-08:00, messaging is straightforward. If peak load pricing differs from property to property, understanding can be complicated.
Real time pricing	Prices are typically calibrated to reflect conditions in the water system such as reservoir levels, rather than taking account of household circumstances.	Real-time pricing is targeted very precisely at water usage when it will put the most pressure on the water system.	Accurately reflects cost of supply, but complicated to communicate. Also less suitable for some areas of the UK where reservoir levels are not under significant pressure.

The optimum tariff scheme for both demand reduction and affordability is likely to be a Rising Block Tariff (RBT)

Each of the tariff options described above assumes the existence of universal metering. As all of the tariff options above – with the exception of social tariffs, which act more as a complement to a tariff design – are in some way responsive to consumption, actually knowing what that level of consumption is 'essential' to calculating the level of water consumed. Metering itself has also been shown to spur more water saving behaviour. While energy and water are two different markets, the roll out of smart meters for energy have been linked with a modest reduction in electricity (roughly -3.4%) and gas (around -3%) consumption based on a 2023 meta-study of supplier evidence.78 As described within the table, the tariffs perform different functions, and meet our criteria of what a water structure should be to differing extents. There is no perfect water tariff, however some tariffs are more adaptable to progressivity targeting than others. We believe the tariff that can most effectively combine these is the rising block tariff.

Because uniform pricing tariffs charge a flat rate per litre, quite simply the more water that is consumed, the higher the water bill. This is the current water charging structure for metered customers in England and Wales. The concept of this is simple and so it is easy to communicate, however there is a limit to how effective it can be at reducing consumption.

With time of use tariffs, the amount that is charged fluctuates in line with demand and/or abstraction costs. Peak load pricing, as is used in energy markets, would mean that water is charged at a higher rate when there is greater demand for it. This can shift water use in part to a different time of day, but it can also have the effect of simply reducing water use by, for example, a shorter morning shower. Real-time pricing means the price of water can be increased when reserves are low. Depending on how much prices increase, time of use tariffs may be very effective at reducing consumption, however they can be difficult to communicate and to gain salience with customers, particularly real time pricing. It also scores badly on an affordability and fairness front.

Seasonal pricing is where water is charged at a higher rate during hotter months, when water use, particularly discretionary water use, is likely to be higher. These are simpler to communicate than time of use tariffs and could be effective at reducing discretionary usage (e.g. filling paddling pools, water lawns etc), but are similarly not designed with progressivity in mind and could become unaffordable unless combined with other measures as well that account for higher essential water usage.

RBT means water is charged in blocks, with price increasing with each block. They are intuitive to communicate and can target genuinely discretionary water use while being adjusted for factors such as household size, or low income households with higher water need. RBTs are also more dynamic than some of the other options and can be paired with seasonal and social tariff elements to further advance both affordability and demand reduction. That said, RBTs are most effective when communication with consumers is clear and frequent, for example ensuring that consumers understand how the blocks work, how to know when they are close to entering the next block and with reasonable notice. They are less useful if, for instance, consumers only find out about their water usage in their bill 6 months later, well after they could have adjusted their behaviour. This is why smart meters, which can facilitate this kind of information, are an important enabler of sophisticated and effective RBTs.

Tariff options can also easily be combined with a social tariff

All of the options can also be combined with a social tariff, for further progressivity. Social tariffs provide rebates or discounts to vulnerable households, making them an excellent option from an affordability standpoint. However, this depends in them being targeted correctly, and customers being aware that they may be eligible for social tariff support. Current evidence suggests that awareness of existing social tariffs is low. In principle, the idea of a social tariff is easy to explain, but eligibility criteria vary from company to company and can involve individual assessments that are less straightforward to communicate. Social tariffs by themselves also have no effect on demand reduction. The sole aim of a social tariff is to make water more affordable, with no targeting of discretionary water use.

CHAPTER THREE – MODEL HOUSEHOLDS ANALYSIS

To illustrate how alternative tariffs might affect household bills, and how this could vary by household type, we have conducted a model households analysis using nine distinct household structures. This involves constructing a small set of archetypal household types that reflect different kinds of household composition and assessing how they respond to different water tariffs. Given the difficulty of accurately predicting behavioural change under different tariff structures, especially for more complex tariffs such as amended RBTs, as well as the wide range of potential scheme designs, we note that these results are intended only to provide an indication of how different household structures may be affected under alternative scenarios. It is not a definitive guide to how alternative tariffs should be structured or priced.

Methodology

We used the Family Resources Survey to help us determine which households should make up our model households. This included:

- Single occupiers (29.2% of households)
- Two adults with two children (8.7% of households)
- Three or more adults, no children (8.4% of households)
- Two adults, no children (34.8% of households)
- Two adults with three or more children (3.3% of households)
- One adult with one child (2.1% of households, or 15% of families)[79]
- Households with a high medical water need, e.g. for dialysis machines
- Households with high discretionary water use e.g. for swimming pools or large gardens
- Holiday homes (around 70,000 properties, but highly concentrated, accounting for 1 in 10 addresses in places like North Wales and Devon)[80]

These household structures were chosen either because they constitute a significant portion of households, or they represent 'edge cases' – households which may undergo disproportionate changes or difficulties under a move to other tariff structures - to account for high medical water need and swimming pools or large gardens. Another consideration was whether the property was a holiday home, and therefore only likely consuming water for a few months of the year, but at a time when there is greater strain on supply.

To identify plausible levels of water consumption for our model households we used data from South West Water, based on figures from CCW, on average annual consumption patterns for different household types.[81] This provides an estimate of how much water, in m^3 per year, households of different sizes could be expected to consume. This provides a starting point for estimating water bills under a range of different scenarios. The estimates are shown below in Table 5. Water consumption on a per capita basis is inversely proportional to the number of people in a household, that is the more people there are, the lower their consumption per person.[82]

Table 5: Annual water consumption by number of people in household

Annual consumption in m^3			
Number of people in household	**Low use**	**Average use**	**High use**
1	45	66	100
2	55	110	136
3	82	136	175
4	110	165	210
5	136	182	245
6+	155	200	265

Source: South West Water

We further identified a range of behavioural assumptions that could influence household consumption patterns beyond this baseline. Firstly, the table above serves as a basis for a ‘consumption pattern’ parameter – in simple terms, whether a household in the model exhibits a low, average or high water requirement.

Secondly, price elasticity. As discussed in Chapter Two, there have been a wide variety of estimates on price elasticity and elasticity responds to various factors including shifting attitudes to water conservation, communications campaigns and so on. But we have included a price elasticity parameter to account for potential behavioural responses to changes in the price of water: while the size of the effect may not be significant, we think it is a plausible assumption that households will reduce their consumption in the face of price rises.

Thirdly, we have included a parameter for seasonality. This is expressed as the ratio of water consumption in warmer months (defined as April to September) compared to consumption in colder months (defined as October to March). This is important to identify the potential implications of seasonal tariff structures, where prices vary by time of year. It is worth emphasising, however, that seasonality in water consumption can vary considerably in different years due to factors such as weather patterns, temperature or temporary leakages e.g. following freeze-thaw events. For example, United Utilities found that for a week in early July, consumption was 17% above the 2018-19 average, while the same week was around the yearly average in 2017-18 and 4% above average in 2019-20.[83] As such, the seasonality parameter in our model is a simplification. However, it is important to consider the seasonal distribution of annual water demand to have more plausible assumptions regarding seasonal tariff elements.

We have also modelled assumptions for higher water usage among certain age groups. It is worth noting that there is no consensus in the literature on whether particular age groups have significantly greater water consumption. Some argue that older people have higher consumption patterns, as they are more likely to spend a larger portion of their day in the home and therefore, consume water there.[84] This is in comparison to other ages who would be more likely to leave the house and consume water elsewhere, such as at work or school. There is some evidence however which suggests that teenagers may have higher levels of water consumption than other age groups. One self-reporting survey in in 2016 found that teenagers have 7.5 showers a week compared to adults who take 4.4 showers per week. The same study reported that almost twice as many teenagers than adults shower for more than 10 minutes.[85] This corroborates with research carried out more than a decade earlier, which found that teens "used incrementally more water for showers and baths than did adults". [86]

Most recently, a 2023 study which used smart meter data to determine household consumption and cluster it into different types found that households with teenagers had higher per household consumption than those without. Overall, this study estimates that households with children recorded a mean daily consumption 26% higher than households without children.[87]

This aggregate figure does conceal nuances when it comes to teenager consumption, however. The study classified household consumption into Evening Peak (EP), Multiple Peak (MP), Late Morning (LM) and Early Morning (EM) clusters based on usage patterns. In most of these clusters, households with children or boys/girls aged 13-19 had higher per household consumption than the mean for the cluster. This effect was large in some household clusters, but smaller in others. Most drastically, teenage girls resulted in a 96% increase above average consumption in the 'EM' cluster. There was also a 20% increase among teenage girls in the 'LM' cluster, while households with teenage boys showed consumption nearly 40% higher than average in the 'EP' and 'EM' clusters. But such large effects of teenagers in the household is far from universal. Households with teenage boys in the LM cluster had consumption less than 10% above average, while in the 'MP' cluster it was around 10% above average. Among teenage girls in the 'EP' cluster there was no effect, while there was even a -13% effect among teenage girls in the 'MP' cluster.[88]

It is difficult to identify a single number to describe this phenomenon as it seems to vary considerably between household usage patterns as shown above. However, there is good reason to think that having children or teenagers in the household can increase consumption. Considering the evidence above, we have therefore assumed a 25% increase in water consumption for households with teenagers or children relative to households without.

Finally, we have tried to account for the additional water needs generated by things like swimming pools, medical equipment and large gardens with significant watering needs. Accounting for these is even harder. Data on the average size of a personal/private swimming pool in England is not something which is routinely gathered. The amount of water used by a pool varies on the size of the pool, rate of evaporation, rainfall, whether it automatically refills to account for water loss, whether it is partially drained for the winter, and so on. A further factor is when the pool was built; older pools are likely to be more porous than newer ones and therefore have a higher level of water loss.[89]

Using a pool which is 66m³[vi], a 2022 study by pool contractor Compass Pools estimated that after filling, a pool constructed before 1999 could require up to 67,355 litres a year.[90] However more modern pools have lower levels of water loss, Compass Pools estimates that with their own more modern pool infrastructure there is more water gain than loss every year. Deep End pools estimated in 2009 that the average daily consumption of a 75m³ pool would be 66 litres, or 24,090 litres a year.[91]

Large gardens face a similar issue. While we can determine average garden size using ONS data, garden size is not directly proportionate to water use. Use varies based on factors like whether there is a lawn, whether there are flower beds and if watered at all, by hose, irrigation system (e.g. sprinklers) or by hand with a watering can. It will also depend on whether the property has a water butt to collect rainwater, or if all water used is freshly drawn. For large gardens we used a watering estimate from Anglian Water assuming a household with a large garden watered with a hose for 15 minutes once a week.

There are also some factors affecting water use that are hard to model, but are nevertheless key considerations when setting tariffs, including cultural and/or religious attitudes towards water use, which may differ between groups of customers. For example, one survey found that men and younger people (aged 18 to 24) are less likely than average to say that they have made a conscious decision to reduce water use and are less likely to engage in water-saving behaviour.[92] We have not included these factors in our analysis here, however understanding the role attitudes can play in affecting water saving behaviours will be a crucial part of any move to new tariff structures.

A rising block tariff can reduce water bills for most households

We compared alternative tariff structures to a 'status quo' flat tariff, which uses the median standing charge and volumetric rate across water companies to calculate bill amounts for a typical customer. This assumes that the household is on a metered tariff, rather than on a rateable value tariff. The standing charge in this case is £31.99, with a volumetric price of £1.72 per m³.

Principally, we were interested in comparing this status quo scenario to a seasonal tariff and an RBT. Additionally, we looked at a 'modified status quo' scenario where a flat rate volumetric charge remains in place, but with the abolition of standing charges.

Table 6: Tariff modelling options

Tariff structure	Description
Option 1: Status Quo	'Default' flat tariff with standing charge at £31.99 and volumetric rate of £1.72, based on the median of values observed in charging schemes.

[vi] On the basis that the average family pool size is, according to Compass Pools, 11x 4 x 1.5m

Option 2: Modified status quo	Flat rate tariff with no standing charge and an increased volumetric rate to £2.
Option 3: Two-part seasonal tariff	Tariff with a high 'summer' volumetric rate set at £2.50 and a relatively low 'winter' volumetric rate of £1.60
Option 4: Adjusted RBT	Comprises a 'basic', 'average' and 'high use' block, with block widths adjusted for household size. The basic block is set at 25m^3 and adjusted upwards for additional household members, while the second block ends at the average levels of usage displayed above in Table 5. The rates are £1.50 for the first block, £1.90 for the second block and £3.50 for the final block.

To understand how the tariff options would affect different household types, we compared the outcomes across low, medium and high average water usage patterns, looked at how consumption might change, and how bills may be different if standing charges were removed.

As referred to earlier in the report, standing charges have been criticised for having a regressive impact on finances, and as the fee is flat, is not affected by levels of consumption. Removing the flat standing charges, and increasing, for example, the volumetric rate helps to ensure that all billing is focused on actual water consumption. Removal of standing charges is also a discussion that is happening across other utilities. At the time of writing, Ofgem are consulting on a zero standing charge within the energy price cap. [93]

Modifying the status quo would benefit smaller households at the expense of larger households

Taking the status quo of a flat rate volumetric charge and modifying it by removing the standing charge and increasing the volumetric charge to £2 would have the effect of lowering bills for many household types, with some significant reductions for low-occupancy lower-use households. It would mostly increase bills for household types with a high usage pattern and would have mixed impacts for those with average usage patterns, with some household types in this bracket gaining and some losing. A summary of potential impacts on bills is shown in the table below.

Table 7: Percentage difference in household bills from the status quo if modified status quo pricing was applied

Household type	Low use	Average use	High use
Single occupier	-20.4%	-12.2%	-5.1%
Two adults, two children	-0.9%	3.2%	5.1%
Three or more adults, no children	-8.3%	-1.0%	1.7%
High medical water need	-12.5%	-2.6%	-0.2%

Swimming pool and large outdoor space	-1.0%	2.5%	4.3%
Two adults, no children	-15.9%	-3.8%	-1.0%
Two adults, three or more children	1.4%	4.0%	6.1%
One adult, one child	-11.5%	-0.9%	1.4%
Holiday homes	-6.0%	-1.7%	0.6%

The main advantage of a modified status quo is that it could reduce bills for a significant number of households where the higher volumetric rate is outweighed by the abolition of the standing charge. This could plausibly improve progressivity through reducing the standing charge, while strengthening incentives for demand reduction through a higher volumetric price. It is less targeted at discretionary use than other tariff types, however, and would not materially increase bills at higher patterns of usage across the board.

Introducing a two-part seasonal tariff could increase the bills of high use customers, but reward lower use customers

Another option we explored was introducing a two-part seasonal tariff. This would apply a higher volumetric charge of £2.50 per m^3 in the summer months (April to September) and a lower volumetric charge of £1.60 in the winter months (October to March).

Based on a price elasticity of -0.2, which we think is a plausible assumption based on the estimates for price elasticity which we discussed in Chapter Two, this would lead to a slight increase in consumption in the winter months in response to a lower volumetric rate and a more significant decrease during the summer months due to the larger relative volumetric price increase and also slightly higher starting consumption in this period based on seasonal water use patterns.

Table 8: Percentage difference from status quo bills if a two part seasonal tariff was introduced

Household type	Low use	Average use	High use
Single occupier	-19.3%	-11.1%	-3.9%
Two adults, two children	0.4%	4.6%	6.5%
Three or more adults, no children	-7.1%	0.3%	3.0%
High medical water need	-11.4%	-1.3%	1.1%
Swimming pool and large outdoor space	0.3%	3.9%	5.7%
Two adults, no children	-14.8%	-2.5%	0.3%
Two adults, three or more children	2.8%	5.4%	7.5%
One adult, one child	-10.3%	0.4%	2.8%
Holiday homes	10.5%	15.5%	18.2%

Notes: assumes higher water need for children and teenagers. Assumes behavioural response from price changes. Assumes a 'seasonality' factor (ratio of consumption in summer months to winter months) of 1.04.

A seasonal tariff set up in this way would give significant incentives to several types of households to moderate their consumption; moving from a high use pattern to a low use pattern could be the difference between higher or lower bills. Broadly, low use pattern households would also save money under a move to the seasonal tariff with no standing charges. However, there are some households – particularly high-occupancy households with children – who could be affected by increased bills regardless of consumption pattern, while among some high-use households there may not be a significant increase in bills and hence weaker incentives to reduce consumption.

Moving toward a Rising Block tariff that is adjusted could target bill increases on the highest users effectively

RBTs vary widely in terms of both block widths and marginal prices, so it is less straightforward to model than for the other tariff types. This is particularly so when it comes to accounting for potential behavioural change. Given the multiple marginal prices that comprise an RBT, there are also multiple scenarios under which consumers might respond to price. They might respond to the 'local' marginal price they currently face; an expected marginal price; the (ex post) average price; or they might respond to a combination of these with various weightings.[94] As such, we note the difficulty in predicting behavioural changes arising from a move to RBTs. We assume below that consumers respond to average prices under an RBT, given that in a schedule with multiple marginal prices, the informational and cognitive costs of correctly identifying expected marginal prices are likely to be relatively high compared to simpler tariff structures.[95]

We considered an amended RBT with a basic, average and high use block, with block allowances increasing in line with household size as well for those with medical needs. The allowance for the first block, set at a low volumetric rate, broadly reflects half the consumption of a 'low use' household. The starting point for the highest block, meanwhile, is set at average consumption levels (discussed above), in order to target above-average water use with higher rates. A summary of these thresholds is set out below in table 9.

Table 9: Rising Block Tariff charging block structures by size of household

Household size	Block 1 endpoint (m^3)	Block 2 end point/ Block 3 start point (m^3)
1	25	66
2	30	110
3	36	136
4	43	165
5	52	182

6	62	200

With the first block set at a slight discount on the flat tariff volumetric rate, at £1.50 per m^3, the second block set at £1.90 and the highest block set at a considerably higher £3.50 per m^3, the proportional impact on bills might look like the table below:

Table 10: Percentage difference in bills from the status quo if household size-adjusted RBT billing was introduced

Household type	Low use	Average use	High use
Single occupier	-26.1%	-14.1%	9.8%
Two adults, two children	-7.4%	8.7%	19.7%
Three or more adults, no children	-15.0%	-5.3%	9.0%
High medical water need	-18.6%	-1.7%	9.0%
Swimming pool and large outdoor space	-7.5%	4.7%	15.2%
Two adults, no children	-22.5%	-7.1%	5.3%
Two adults, three or more children	-5.5%	9.0%	22.2%
One adult, one child	-17.4%	5.9%	16.1%
Holiday homes	-13.5%	-8.3%	-5.6%

Notes: assumes higher water need for children and teenagers. Assumes behavioural response from price changes in response to average prices.

When it comes to changes in bills, an RBT can ensure that reductions are targeted at low users, while significant bill increases are targeted at higher users. Among average users, some household types could face very similar bills under RBTs, while other household types would see a more significant decrease in their bills after behavioural responses.

Given the multiple marginal prices of an RBT, and hence differing changes in the average price facing different households, it is also worth considering how demand responses might vary among different types of households. This is presented in the table below, which shows that among high use households in particular, an RBT with a higher block with a high volumetric rate could prompt modest demand reductions. Among households with an average consumption pattern, the picture is mixed, with some household types slightly reducing their consumption while others see little change or a slight increase. Among low use households, consumption may increase as a result of the lower prices.

Table 11: percentage difference in household consumption once adjusted for behavioural response

Household type	Low use	Average use	High use
Single occupier	6.2%	4.1%	-3.0%

Two adults, two children	1.8%	-2.8%	-6.4%
Three or more adults, no children	3.7%	1.6%	-2.9%
High medical water need	4.5%	0.5%	-2.8%
Swimming pool and large outdoor space	1.9%	-1.5%	-4.9%
Two adults, no children	5.4%	2.2%	-1.7%
Two adults, three or more children	1.4%	-2.9%	-7.2%
One adult, one child	4.2%	-1.8%	-5.1%
Holiday homes	3.3%	2.0%	1.4%

Comparing an adjusted and unadjusted RBT

The analysis above is favourable to the idea of an 'adjusted' RBT with thresholds that vary by household size. In practice, however, water companies are likely to find it difficult to maintain an accurate picture of household occupancy over time, whether due to administrative resource or availability of data. The challenges around this will be further discussed in the next chapter, however it is worth comparing what the impacts of an adjusted RBT could be versus that of an 'unadjusted' RBT where the thresholds are the same for all households and do not vary with household size.

To see what might happen under such an unadjusted RBT, we have repeated the analysis above with the thresholds set at the level of a two-person household – that is, 30m^3 in the first block, up to 110m^3 in the second block, and the highest prices on any consumption above that.

Perhaps unsurprisingly, under an unadjusted RBT with the default blocks set to reflect the consumption of a two-person household, smaller households – particularly single households – would win at the expense of larger households. Larger households, even with average levels of consumption, would see starkly higher bills under an unadjusted RBT. Admittedly, though, most types of household would still gain under an unadjusted RBT if they had below-average water consumption, with the notable exception of households with three or more children and those with high water needs from swimming pools and large gardens.

Table 12: percentage difference in household bills on an unadjusted RBT

Household type	Low use	Average use	High use
Single occupier	-27.7%	-18.3%	-10.4%
Two adults, two children	5.9%	23.8%	31.7%
Three or more adults, no children	-13.9%	5.3%	17.4%
High medical water need	-18.6%	-1.7%	9.0%
Swimming pool and large outdoor space	5.3%	20.9%	28.5%
Two adults, no children	-22.5%	-7.1%	5.3%

Two adults, three or more children	16.1%	27.3%	35.9%
One adult, one child	-17.4%	5.9%	16.1%
Holiday homes	-11.3%	2.5%	12.6%

As can be seen in the table above, an unadjusted RBT performs significantly less well on affordability grounds. Indeed, not adjusting an RBT for household size effectively undoes many of the advantages of RBTs discussed above.

Case study: a typical four-person family

A typical four-person family with two adults and two children has a household income of around £60,600[vii] and consumes around 206 m^3 of water annually, reflecting average water use. Under a typical flat-rate metered bill, this household could expect to pay £344 a year for their water.

Under a modified flat rate tariff, this bill would go up to £412 without any adjustments to their usage; while having no standing charge would save them some money on their bills, this effect is outweighed by the higher volumetric rate. If this household responded to the higher volumetric rate by reducing their consumption slightly, by around 3.3%, the 'amended' total could instead be around £399.

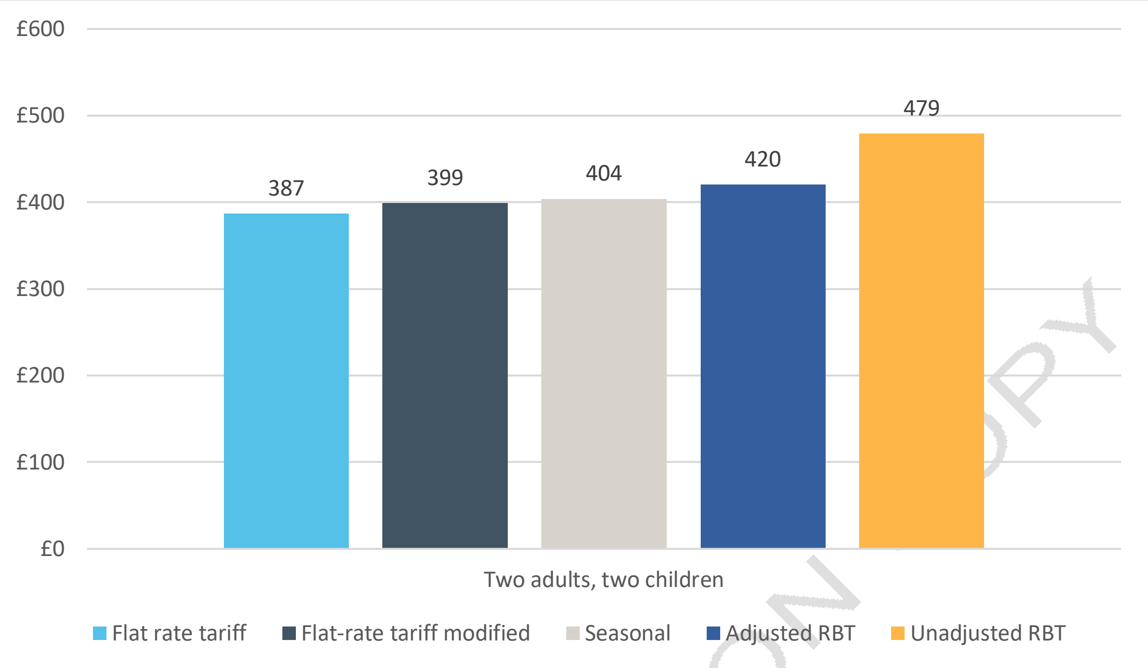
A seasonal tariff with rates of £1.60 for winter and £2.50 for summer would represent a much sharper increase to this household's water bills. If the family did not reduce their water consumption, the total could be as high as £426, with this total mostly coming from summer consumption. With reductions in summer usage, however, this bill could come down to £404.

With its consumption patterns, this household could reach into the highest block of an RBT, prompting a bill of around £440. But the higher average price the family faces could prompt them to reduce their consumption, particularly to avoid consumption in the highest block. With a modest 2.8% reduction in their consumption in response to the higher average bill under an RBT, their RBT bill could come down to £420. Over time, as the household gets accustomed to the way the RBT operates, they might reduce consumption more drastically, especially if they adjust their behaviour in response to marginal prices in the RBT. This is under an adjusted RBT which accounts for the household's size. Under an unadjusted RBT, however, this household could be paying significantly more: potentially around £479, meaning that even without using water excessively they could be far worse off than the status quo.

Four-person families are among the biggest losers under the bill changes we have examined in this chapter, as they are likely to pay more under any of the options we have explored. That said, the price changes from moving to other tariff types could prompt these households to adjust and reduce their water consumption.

[vii] This is the median household income among households with this composition type according to the Family Resources Survey

Figure 3: spending under different tariff types for a typical four person family with average water use



Case study: household with medical needs on low income

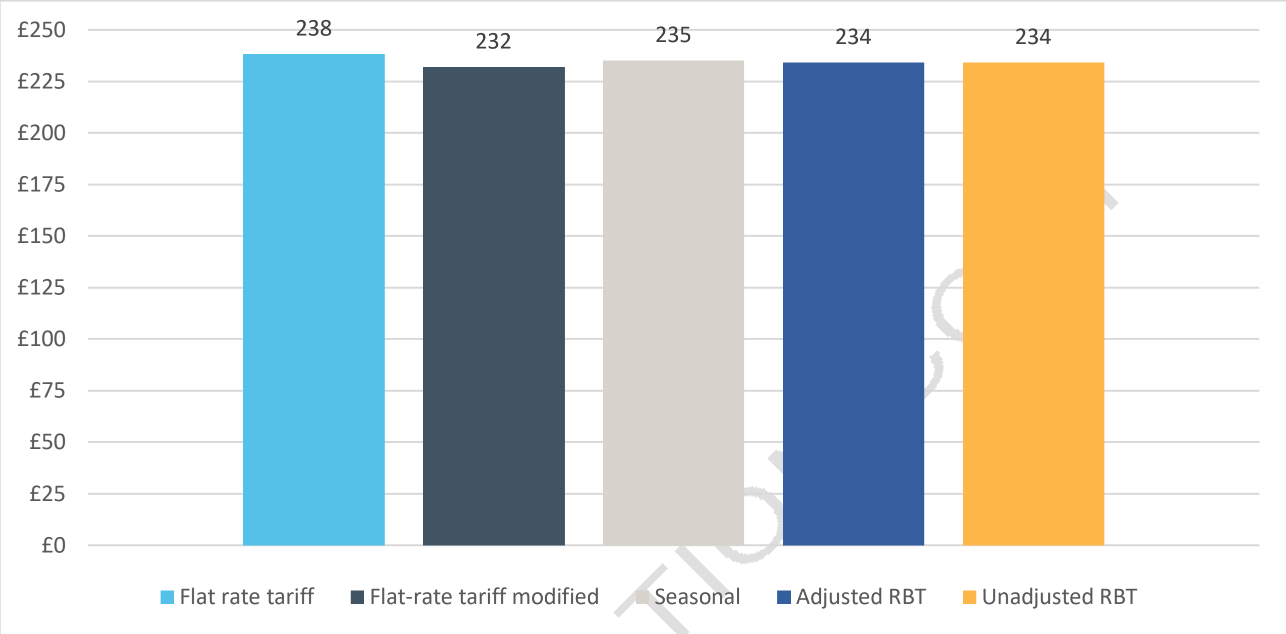
A move to a new tariff structure risks overlooking the needs of households with high water usage that results from illness or disability. Some forms of medical need, particularly home dialysis machines, have significant water resource requirements: sessions can generally use between 120 litres and 200 litres of water.[96] Home dialysis water exposure can, depending on the prescription and treatment plan, often range between 150 litres a week to over 400 litres.[97]

There is a risk that higher water consumption, which is necessary for medical reasons in such households, may drag people into higher RBT blocks or entail large seasonal bills if summer rates are set high. Additionally, disabled households typically earn less than their non-disabled counterparts, which exacerbates this challenge.[98]

We considered the case of a two-person household with additional medical needs amounting to 10 m^3 per year, reflecting a potential need for dialysis treatment. They earn £18,400 a year (the 10th percentile household income for a household of two adults over pension age). Under a typical flat rate tariff, assuming average consumption patterns, this type of household could pay £238. A move to a modified flat rate tariff would see them paying £232, while a move to a seasonal tariff could see them paying £235.

This household would save under an RBT even if the household has an otherwise normal consumption pattern. But even if the household was in line with water usage levels the RBT is trying to incentivise, the extra water usage necessitated by the dialysis machine would in our model tip the household into the highest block, resulting in a bill of £234 after behavioural adjustment and adding £35 to their annual bill (the additional consumption from the medical equipment multiplied by the highest block rate) – making a significant difference to how much they would save under the new tariff. Since in this analysis an 'unadjusted' RBT has been set at the level of a two-person household, this household would not be affected by the lack of adjustment.

Figure 4: spending under different tariff types for a two person household with high medical needs



Social tariffs will likely have a continuing role to play under a new tariff to protect certain households

Our analysis above indicates that under different tariff structures, many households can benefit, in particular those with single or low occupancy or with low usage patterns. To some extent, this could reduce the extent of social tariffs that may be needed. Considering that if the majority of single households, which comprise almost 30% of all households, saved money under a new tariff this could reduce pressure on current social tariff schemes.

However, there are likely to be losers as well as winners under a move to a new tariff system and the case studies we outline above provide a note of caution regarding households with high occupancy and households who may have higher water needs for medical reasons. Some of these households, as outlined above, could see significant proportional increases in bills if they are high users. In a move to a new tariff structure, particular priorities will be to increase the awareness and take-up of social tariffs, which is presently low, and to protect households from being put into higher marginal prices because of consumption that is non-discretionary.

Social tariffs will be particularly relevant if a form of unadjusted RBT is adopted since, as shown above, such a scheme would likely be to the detriment of higher-occupancy households. In this case, social tariffs would have a vital role to play to complement the RBT and address the likely impacts it could have on financially vulnerable, high occupancy households.

This section first discusses some general considerations around social tariff design before exploring potential approaches to addressing the impacts of an unadjusted RBT.

Case study: Single occupier on a social tariff

Per capita water use tends to be inversely proportionate to the number of people in a household. Whereas a household of two people uses an average of 110m^3 (so 55m^3 each), the annual average water use for a one-person household is 66m^3. New tariffs, particularly if unadjusted could make water bills unaffordable for low-income single occupiers, even in households with moderate water needs. While they have the highest per capita level of consumption, single households (under pension age) in the lowest quartile also have the lowest income of all groups we looked at, with an annual income of £13,377 for men and £12,740 for women. Households in this quartile also have the highest housing costs, spending around 21% of their income to cover the cost of accommodation.[viii][99] This would leave single occupier men with £10,568 and single occupier women with £10,065 after housing costs. Given the lower income, and therefore a higher risk of unaffordability, we will examine the case of different tariff structures on a single woman occupier in the lowest income quartile.

In keeping the status quo, these households' annual clean water bills would come to £146 for average use, or 1.4% of income after housing. Removing the standing charge and adjusting for reduction in water use would reduce bills to £123 or 1.3% of annual income. On an (adjusted) seasonal tariff, this would be higher at £129 (1.3% of income). Under a RBT tariff, bills would be £115, but with behavioural adjustments, and an assumed slight increase in consumption, this could be expected to increase to £121, or 1.2% of income. While different tariffs can therefore be positive for this type of household assuming average use, among higher users both an RBT and seasonal tariffs could result in higher bills than under the status quo. Given the potential financial vulnerability of these households, social tariffs may still be needed in some cases to ensure affordability.

While the above household would not appear to be in water poverty based on the '5% threshold'[ix], given its low income level, the household could still be eligible for other social tariffs that have eligibility criteria that is broader than the 5% threshold. All water companies offer social tariffs for those who are on low incomes or who may be struggling to pay their water bills. Eligibility criteria is highly varied across companies, but tends to depend on income, whether the household is in receipt of benefits and depending on whether water bills account for a particular percentage of household income. The most common form of social tariff is a percentage discount, from as little as 15% to as much as 90%. However, a maximum 50% discount seems to be the most common.[100] Other forms of support also exist: for example, several water companies provide social tariffs in the form of a cap on bills.[101]

[viii] IFS analysis of housing indicates that the poorest quartile of households spent 21% of their income on housing costs in 2021.

[ix] although this threshold will usually also take the cost of wastewater bills into account too.

There are multiple options for delivering a social tariff, but these need to consider targeting and incentives for demand reduction

As the case study above discusses, social tariffs can be delivered in a variety of ways, ranging from simple discounts to alternative price structures to bill caps. When it comes to eligibility, the SMF has previously called for eligibility based on a 'bills to income ratio', which would provide social tariff support in the case that water bills exceed a certain percentage of household income.[102] The key advantage of this strategy for deciding eligibility is that it targets social tariff support at those who genuinely most need it, taking into account both household usage and household circumstances. This could reduce the outlay of social tariff schemes. Indeed, some companies already make use of such a strategy for deciding eligibility: for example, Thames Water's 'WaterHelp' scheme offers a 50% discount for households if their water bills account for over 5% of their net income.[103]

The main disadvantage of this approach is that it is potentially time consuming and administratively resource intensive in the absence of widespread data sharing between government departments and water companies. At present, households typically have to apply to receive support from such schemes and provide data to the water companies themselves; auto-enrolment on social tariff schemes with sophisticated eligibility mechanisms is therefore difficult to achieve in the current context.

Beyond deciding on eligibility criteria, a move towards a new tariff scheme also opens up new considerations for social tariff discount design. In part, this is because of the centrality of demand reduction to the objectives a new tariff structure is trying to achieve, and therefore the importance of managing the tension between guaranteeing affordability and promoting water-saving behaviour. As well as this tension, some tariff structures open up new possibilities for how social tariff support could be delivered.

Option 1: a bill cap

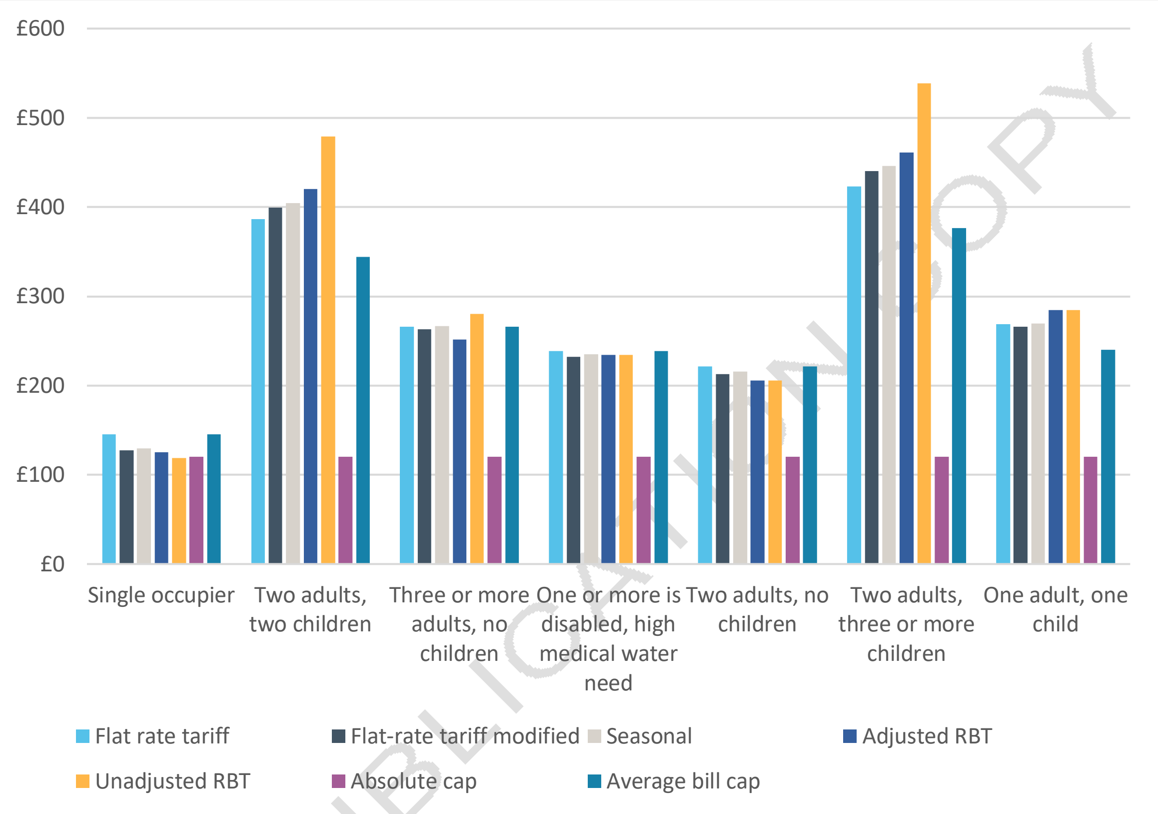
Perhaps the simplest approach to delivering social tariff support is to cap bills at a specified level, ensuring no household pays more than a certain absolute amount. This approach is easy to communicate to customers and provides a clear signal on maintaining affordability of water bills.

Social tariffs currently offering bill caps for water range considerably. The key difference between the caps is whether they apply to just the clean water or both clean water and sewerage. For clean water only, caps vary from as low as around £80[x], to as high as £183. Caps which are applied to the whole water bill also range significantly, £290 to £364. .[104] Some companies offer a bill cap that ensure households are not charged more than the average bill for the area or the company's minimum charge that year.[105]

[x] With the Affinity Water-lift programme, annual clean water bills can be capped at £119.50, but those in receipt of council tax reduction/support can be eligible for a higher rate discount where the cap is £79.70

Clearly, taking either of these approaches would lead to significant savings for eligible households, particularly among higher-usage households. Capping bills at an 'average' bill defined as what a household of that type would need to spend on water with average usage patterns would also deliver significant savings for some household types.

Figure 5: Spending under different tariff and social tariff scenarios among 'high user' households



However, this approach comes with significant disadvantages in our assessment. Firstly, the threshold at which a bill cap is set is arbitrary and also means that households which use more water benefit more from the social tariff. More importantly, a bill cap breaks the link between water usage and water bills above the threshold, meaning that above a certain limit there is no price signal for reducing additional water usage among eligible households. There are other ways of delivering a social tariff discount which do not completely eradicate the price signal in this way and maintain some degree of incentive structure for water conservation while improving affordability.

Option 2: bill to income ratio

Water poverty has generally been understood on a bill to income ratio metric. Households whose water and wastewater bill amounts to 5% or more of their income after housing costs are usually deemed to be in water poverty. However, bills to income could also be a means to institute social tariffs. Those on lower incomes would still be charged based on their usage, but their volumetric rate would vary depending on their income level.

This is in place to some extent with existing social tariffs. Some companies which apply discounts do so based on regular water bills exceeding a certain proportion of household income. A prominent example of this in practice is Thames Water's 'WaterHelp' scheme, which offers a 50% discount on water bills for households whose water bills are higher than 5% of their net income.[106] Households have to apply to this scheme and provide information about their income and their regular water bills. This form of social tariff has its upsides insofar as it is a way of precisely targeting support at those households most in need. However, it is relatively difficult to communicate and to implement, especially given the challenges of keeping relevant data up to date.

Option 3: a fixed discount

The other most common way of delivering social tariffs is through a simple proportional discount applied to bills. This is sometimes a fixed amount, while in some water companies the discount applied through a social tariff varies according to income and other household circumstances. While the depth of discounts does vary widely from company to company, a typical amount is 50%.[107]

Applying a flat discount of this kind to final bills would mean that every household type got the same proportional saving on their bills – even though in absolute terms some households would see a higher saving due to higher water consumption, this is arguably fairer than the situation under a bill cap, where higher-consuming households could have both higher absolute and higher relative savings than other households which consume less water. Similarly to a bill cap, this discount type is also simple to communicate. Another theoretical advantage this approach has over the bill cap is that it maintains a water conservation price signal, even though this is somewhat weakened by the discount.

Even so, some questions on design arise from a move to other tariff types. For example, should a flat discount still be applied to the final bill under a seasonal tariff or a RBT? Or should discounts be targeted specifically at certain higher-rate blocks or summer rates? Ultimately, these amount to questions of the extent to which it is desirable to weaken demand conservation signals in a tariff structure for the sake of applying discounts. Using 'split discounts', where only a certain part of the bill is discounted (for example the first block of an RBT) could provide one way of providing a meaningful discount to households with affordability challenges while largely maintaining conservation-oriented price signals at the top end of consumption.

Option 4: a separate modified tariff structure

A fourth alternative for structuring social tariffs is to place eligible customers onto a modified version of the tariff structure. This is very similar to the 'split discounts' design discussed above, but rather than applying an ex post discount to the bill, this would place customers on a distinct tariff with its own volumetric rates and/or thresholds. This could be done, for example, by reducing the volumetric rate for eligible households on the first block or taking away the highest block such that households pay the same rate for all consumption above the threshold for the second block.

The table below considers the proportional impact on some household types of making these kinds of adjustments to an RBT. The relative savings to household types are shown for two options: firstly, moving the first block to a zero-rate (effectively removing it or, looked at another way, offering a free allowance of water for eligible households only); or secondly, amending the highest block so that its volumetric price matches that of the second block (effectively removing the highest block). The impacts shown in the table are relative to our default RBT that has an initial volumetric price of £1.50 in the first block, £1.90 in the second block and £3.50 in the third block.

Table 13: Assessing 'separate tariff' options for a social tariff

	Adjusted RBT – zero rate first block			Adjusted RBT – merged second and third block		
Household type	Low use	Average use	High use	Low use	Average use	High use
Single occupier	-39.16%	-20.48%	-11.00%	0.00%	-3.50%	-17.63%
Two adults, two children	-23.94%	-11.44%	-8.08%	0.00%	-4.02%	-12.04%
Three or more adults, no children	-30.10%	-13.77%	-9.40%	0.00%	-1.42%	-11.56%
High medical water need	-31.65%	-12.25%	-9.20%	0.00%	-4.75%	-11.81%
Two adults, no children	-38.29%	-14.28%	-10.31%	0.00%	-1.87%	-10.67%
Two adults, three or more children	-23.16%	-12.45%	-8.15%	0.00%	-3.93%	-13.37%
One adult, one child	-34.34%	-12.07%	-8.85%	0.00%	-4.97%	-12.09%

This approach to social tariffs could work to broadly reduce bills for households, while maintaining the incentive structure of the overall tariff. It could work particularly well if more generous volumetric prices or thresholds were applied in the first block rather than higher blocks, as it would deliver universal savings and target the most support on the lowest-usage households. However, introducing an entirely separate tariff scheme for those on social tariffs may prove to be administratively challenging, and companies would have less control over exactly what discount a customer got through a social tariff.

Option 5: consumption-contingent social tariff discounts

An approach that has been used in some other jurisdictions is to tie social tariff benefits to certain consumption behaviours. An example is the city of Zaragoza in Spain, which runs a three-block RBT. The city applied a 25% rebate off total bills for large households comprising six or more individuals on the condition that their consumption did not exceed the upper limit of the second block in the scheme. The city also instituted more bespoke 'stretching' incentives for households: households who reduced their water usage by at least 40% in the first year of joining the RBT received a 10% discount off their bill, and a similar discount continued to apply to these households for each further 10% reduction in water usage achieved in each subsequent year. In Zaragoza's case, the combination of adopting an RBT and integrating conservation incentives has shown a considerable degree of success: between 1996 and 2008, the city achieved an overall reduction in water consumption of 27% even though the city's population in fact increased by 12%.[108]

Design features such as this could help to maintain the balance in social tariffs between guaranteeing affordability and retaining an incentive for demand reduction. In the discussion above we have focused on using prices as a way to dissuade higher consumption. However, the flipside of this approach is to use mechanisms to reward lower consumption. In the case of social tariffs, using a base discount on bills to maintain affordability alongside an additional discount that is contingent on observed usage reductions could be a potential approach to keep water affordable for vulnerable households without compromising on having a strong incentive on demand reduction.

Social tariffs for an unadjusted RBT

In the event that an adjusted RBT is not feasible, an unadjusted RBT will most likely need to be accompanied by some form of social tariff in order to mitigate the largest bill rises for high-occupancy households.

Perhaps the most obvious solution is to offer high-occupancy households a rebate that would take their bills back to what they would be under an adjusted RBT system. If, for example, a four-person household (two adults and two children) with high water usage spent £548 under the unadjusted RBT, whereas under an adjusted RBT the total bill would have been £490, they could apply to receive a rebate to bring their bill back down to this level. While this would help to achieve the same effects as an adjusted RBT, it is an administratively cumbersome approach to doing so and would place the burden of applying on households, with considerable risks that financially vulnerable households could still pay too much if take-up is low.

Alternatively, eligibility for existing social tariffs could be amended to take into account household occupancy or include those on Child Benefit. Such arrangements already exist in some social tariff support schemes, for example the WaterHelp tariff from Thames Water. This scheme, which opened in April 2024, offers a 50% discount on bills based for those whose water bills take up more than 5% of household income, taking into account how many people live at the property.

CHAPTER FOUR – THE BARRIERS TO REFORMING TARIFFS

In the previous chapters we have discussed the theoretical case for a new tariff structure and explored some of the potential impacts a move to a new structure could have. However, when it comes to implementation, there are a number of practical challenges and regulatory barriers that might make adoption of a new tariff more difficult, which are the subject of this chapter.

The current regulatory structure can inhibit innovation in tariff reform

The water regulator Ofwat carries out a price review every five years which determines the amount that can be collected from customers through bills. This is based on scrutiny of five-year business plans submitted by water providers, which set out the investment and performance commitments water providers expect to undertake. Ofwat assesses whether these business plans meet its expectations and arrives at a 'determination' – the price, service and incentive package that it expects each water provider to adhere to over the five-year period.

Ofwat makes use of a variety of financial penalties and rewards to incentivise performance and to smooth changes to water charges over time. One instrument for this is the Revenue Forecasting Incentive (RFI). Revenue from charges can be forecast to some extent by companies, but there is always some uncertainty. The purpose of the RFI is to incentivise accurate forecasts and keep over/under-recovery of revenue to a minimum. It does this by enabling water companies to adjust their charges within different years of a price control period, so as to avoid massive swings at the beginning/end of a period if the amount of money collected by a company is significant difference to the forecast. Crucially, the incentive mechanism consists of a tolerance limit or "deadband" of allowed over/under recovery, after which a financial penalty is applied to the company. In 2019 this was set at +/- 2%. A maximum penalty is applied above a 3% variation. This means that if a water company collects materially more or less revenue than expected in a given year, it is financially penalised.

Ofwat has proposed to continue the RFI mechanism with the same deadband thresholds for 2025 to 2030 on the basis that it considers there is no correlation between the level of metering penetration and the level of revenue imbalance.[109] The core of Ofwat's argument is that there is no reason to believe that company revenue is becoming more volatile in the next price review period, or alternatively that there is no reason to believe that companies are unable to cope with greater variability in their forecasts.

However, a restrictive deadband is likely to be harder to maintain under a roll-out of novel charging structures. As some water companies have pointed out, without substantial revenue variation in tariff trials we will learn little of value about how novel tariffs can change behaviour or improve affordability.[110] More broadly, the point of introducing new and more dynamic charging structures is to try and change behaviour, which is likely to have significant impacts on recovery and revenue stability from year to year as novel tariffs are rolled out more broadly. In other words, less revenue stability is a design feature of novel tariffs, as they are meant to change behaviour and introduce more variables which make forecasting revenue more difficult. Recognising this, there is a case for either widening the deadband or reducing penalties in order to encourage the roll-out of novel water tariffs.

Ofwat also sets charging rules, set under guidance from the UK government, that water providers must follow when determining their charging schemes. These charging rules are set out in a 'Charging Scheme Rules' document.[111] This constitutes a set of principles that must be followed when setting water prices. Key themes within this document include the impact on customers of bill changes and on cost reflectivity.

In terms of the impact on customers of bill changes, the current charges scheme rules explicitly refer to principles of "fairness and affordability" and "stability and predictability" when setting charges. Additionally, undertakers are required to carry out an impact assessment when the nominal value of bills for a customer type is expected to increase by over 5%. These provisions reflect a priority within the charging rules of limiting drastic year-on-year changes in customer bills.

The principle of cost reflectivity entails that water services should reflect the long-run overall costs of provision – in other words, customers, at least on a long-term and collective basis, should pay for what they use. Beyond this, there are provisions stating that differences in charges between different classes of customers – for example, metered vs. unmetered or larger vs. smaller users must be based on cost differences of supply associated with differential use of network assets.

A key concern around current provisions is that they may complicate a wider move towards novel tariff structures. Introducing new approaches to water prices, particularly those that place greater emphasis on demand reduction, may imply more difficulty in accurately forecasting revenues. Moreover, significant changes to marginal prices – whether through levels of consumption as with RBTs or during different time periods as with seasonal pricing – seems to produce a slight tension with the goal of stable, predictable bills from the customer side. Perhaps the largest concern lies with the principle of cost reflectivity. Unlike many other tariff structures, RBTs are not designed to be strictly cost-reflective. In fact, there is limited justification for RBTs from the perspective of cost reflectivity on the level of the customer, as thresholds are not set explicitly based on marginal costs.

While RBTs as a whole could in principle be calibrated to equal long run marginal costs of supply, it is difficult to see how RBTs would fully satisfy, for example, the current Charging Guidelines principle 15 which states that any differences in charges between larger and smaller users must only be based on cost differences associated with differential use of network assets. By design, RBT blocks are not necessarily pegged to the costs of supply; they are instead geared towards supporting other goals such as supporting affordability or facilitating demand reduction, particularly among higher users. As such, in many RBTs that are implemented around the world, initial blocks are charged below the cost of supply, with costs recovered in the higher blocks. This indicates that there is a potential tension between existing charging rules around cost reflectivity and the permissibility of alternative tariff structures, in particular RBTs.

Admittedly, tariff trials can give water companies room to innovate in this area, so Ofwat recently revised its charging guidelines to state that:

> "For the avoidance of doubt, when trialling new charging structures undertakers may (for an appropriate limited period) impose different charges to customers participating in the trial as compared to customers who are not participating".[112]

But the main concern of water companies remains adhering to the regulator's rules and avoiding straying from cost reflectivity or incurring penalties under the RFI. This can inhibit which tariffs they trial if any, unless they are given license to do so by the regulator. Currently, while the regulatory environment does permit latitude to temporary trials, there is less clarity around how a longer-term shift to a different tariff type would interact with provisions around cost reflectivity and the RFI. Consider that the quote above is not entirely clear on whether different charges can be imposed on the same customers within a trial period (as would be necessary under a seasonal tariff or RBT, particularly if the RBT had a social tariff element with different charges and thresholds) and does not explicitly suspend the principle of cost reflectivity for trial charges. This is an example of how a move to new tariff structures demands greater clarity and precision in the charging rules as to the proper application of the charging principles.

Another potential barrier facing novel tariffs lies in the C-MeX mechanism. C-MeX is based on surveys with customers about their satisfaction. Based on how a company scores relative to others, it can receive rewards or penalties.

When it comes to tariff trials specifically, some water providers have suggested that C-MeX may punish innovation in charges if complaints from trial customers – particularly those in households that may lose from changes to tariff structures – are sampled and they are unsatisfied.[113] Some providers have suggested exempting trial customers from C-MeX altogether, while others have recommended introducing a separate scoring system for this.[114]

The impact of C-MeX should not be overstated; indeed, some water providers have said themselves that, at least currently, the effects of C-MeX from tariff trials are likely to be quite small due to the limited numbers of customers typically involved in charging trials.[115] However, even at present there is a case to be made that acknowledging the impacts of instruments such as C-MeX and considering their implications for tariff trials can help to promote a culture of innovation among water providers.

Practical constraints are also an issue

Technology, or lack thereof, is inhibiting progress on tariff reforms

As well as regulatory constraints, technology plays a big role in being able to introduce new water pricing structures. As we noted in chapter 3, any tariff which is based on consumption, irrespective of its aims, cannot accurately do so without a meter being installed. As it stands, almost two thirds of households have any kind of water meter installed.

Unlike the energy market, Advanced Metering Infrastructure (AMI), or smart metering in UK water systems, is extremely limited. Only around 13% of households have a smart meter fitted.[116] Recently, however, Ofwat has stated an aim to install 10 million smart meters over 2025 to 2030.[117] This would significantly increase the proportion of households with a smart meter. At the last census there were 24,782,800 households in England and Wales.[118] With an additional 10 million installations this would mean that by 2030 around 66% of households would have a smart water meter. A smart meter itself is not strictly necessary for most proposed tariff types, but it can be more effective at reducing demand than conventional meters.[119] It also results in more accurate data on use, including real time consumption, enabling both water companies and consumers to be more responsive to consumption. Smart meters can be read remotely, which can lead to more frequent customer billing and thus better consumer understanding of water consumption. In the first National Infrastructure Assessment, the National Infrastructure Commission recommended that the Department for Environment, Food and Rural Affairs should enable water companies to implement compulsory metering by the 2030s, beyond the current allowances of compulsory metering for water stressed areas and for properties with a swimming pool, power shower and so on.[120]

A lack of data on household characteristics linked to water use makes it difficult to adjust tariffs

As shown in our modelling of a RBT, having robust and reliable data on household characteristics including household size, water demand for medical needs and so on is necessary to accurately adjust the blocks for essential water use. Without this information bills could quickly become very expensive for those with low discretionary water use but high essential use. Similarly, without adjustment those with higher discretionary use may have less incentive to reduce consumption if their allowance is unrealistically low. There has been widespread criticism in the literature of such 'unadjusted' RBTs; given the clear linkage between household size and water use, not accommodating for household size critically weakens the case for RBTs.

Gathering this data is not straightforward, however. Water companies often do not hold this type of data on their customers. Data-sharing architecture in government would also likely have to be improved. In other countries such as Belgium, household occupancy data is routinely collected by government through a comprehensive national register which can then be used to regularly update water tariffs. In England and Wales, such a centralised national register does not exist, though limited information on occupancy can be found in Council Tax records (including single occupancy forms and HMO status) and DWP records, such as receipt of Child Benefit or following Universal Credit claims for the purpose of working out entitlement.

Extending data matching powers between public bodies and water companies could be a potential way forward for building a better picture of household occupancy. The SMF has previously recommended a similar approach in the context of targeting social tariff support.[121] Household income data is held by HMRC in its Real Time Information (RTI) dataset, while consumption and billing data is held by suppliers. Further information on households is held in Council Tax and DWP records. Pooling and matching these sets of information could build up a more detailed picture at the household level.

The Digital Economy Act 2017 (DEA) allows HMRC's RTI data to be shared with outside organisations for public interest purposes. These powers are already being used for public interest projects: for example, HMRC shared information about individuals' earnings with the Department for Education and three local authorities running a social impact bond trial.[122] More specifically, Section 38 of the DEA allows specified authorities to disclose information to water and sewerage undertakers "for the purpose of assisting people living in water poverty by reducing their water or sewerage costs, improving efficiency in their use of water, or improving their health or financial well-being.".[123] Currently, this data disclosure needs to be in connection with a water poverty measure listed in Section 38(3) of the DEA, which includes social tariff schemes and the WaterSure Schemes.[124] The DEA could be amended in order to expand the scale and scope of data sharing in support of novel tariff structures; indeed, one amendment to the DEA has recently been put forward which would expand the scope of information sharing and automatic enrolment from "people living in water poverty" to a broader category of "eligible people".[125] Since the DEA sets the conditions for information-sharing between public bodies and water providers – currently to assist those living in water poverty and in connection with social tariffs or special provision – changing the DEA is likely to be necessary to apply information sharing more broadly, for instance for the purpose of supporting innovative tariffs.

A less satisfactory approach, though one that has been used in other countries, is to depart from a 'pure' per capita approach to calculating RBTs and assume a default household size as a starting point for calculating bills. Several cities in Europe have previously used a basic block in their RBT that assumes a four-person household. In part, this seems to be due to administrative reasons, as families larger than this were at the time entitled to a number of benefits which could be used as flags for the purposes of changing the water tariff block.[126] But it could compensate for a lack of effective data on household sizes.

A related approach is to use a child count, rather than a pure per capita count, to estimate household occupancy. Some RBTs that have been implemented elsewhere have used this approach. Sometimes this takes the form of a generous per capita addition for extra children above a threshold (for example, beyond the second child), while a discount is applied in other cases (for example halving the metered bill if there are three or more children).[127]

The economist Paul Herrington has previously suggested that given the lack of an up to date 'national register' in England and Wales, such an approach might need to be used in the short term here.[128] That is, the likely approach would be to use a default household number and invite applications (with a list of acceptable forms of evidence) to update records with any additional household members. Where such a default household threshold is set would have a significant bearing on the administrative load that water providers would face in verifying household size claims. Table 14 below shows how occupancy is distributed across households in the UK, according to data from the ONS' Family Resources Survey.

Table 14: Household size data

Household size	Count	Percentage of all households
1	8,298,857	29.2
2	10,476,941	36.9
3	4,039,184	14.2
4	3,795,433	13.4
5	1,180,724	4.2
6	356,260	1.3
7	139,619	0.5
8	64,457	0.2
9	27,400	0.1

Source: Family Resources Survey

If a default household size was set at two, this implies that a third of households would have to make an application if they desired. While a lower 'default household' threshold has the advantage of making fraudulent claims more difficult, it would place a difficult administrative strain on water providers. Again, perhaps the best response to this challenge is to make use of benefits data so that, at the least, any benefit recipients would receive an accurate number of allowances.[129]

Alongside making use of benefits and incomes data, one approach that could complement these efforts is to make use of smart meter data to estimate occupancy. Since water is used only when there are people present at a property, smart meter data has been considered as a non-invasive way of inferring occupancy patterns from information on water consumption. Such an approach has been tested in some households in Devon and Cornwall in the context of working out whether households exhibited signs of being used as second/holiday homes, which could be relevant to better estimate demand or if there is a tariff element introduced for holiday homes.[130] Previous work on simulated datasets has also estimated household characteristics including household size, employment status and employment schedule from water smart meter data.[131]

Such approaches have already been explored more extensively in the electricity sector, where work on using electricity smart meter data has established links between electricity consumption and the number of residents, the presence of children or older occupants, and even – through examination of when peaks in demand occur – commuting patterns. Through this approach, researchers have been able to predict whether households are in paid work with 70% accuracy compared to survey data.[132]

The smart meter data approach is, admittedly, unlikely to be sufficient by itself to support an amended RBT; it is likely that in practice more detailed on-the-ground evidence and verification would be needed. However, using smart meter data could provide a useful way of flagging occupancy changes and unusual patterns in consumption, which would greatly help with directing administrative resources and identifying any potential cases of fraud or unusual household behaviour.

CHAPTER FIVE – RECOMMENDATIONS

To realise the benefits that different charging structures can bring, government and the water sector need to address the technological barriers that inhibit the adoption of other charging structures – particularly through metering – and enable water companies to innovate on tariffs by ensuring a supportive regulatory environment. Alongside these efforts, practices that encourage water conservation among households to the greatest extent should also be adopted and encouraged.

Accelerate smart meter rollout with compulsory metering where feasible

The need for greater metering for water has been noted by the Environment Agency (2007) the Walker review (2009), the National Infrastructure Commission (2018), the Department for Environmental and Rural Affairs (2019), and by water companies themselves.[133] As we have shown, simple metering can reduce water consumption, and more sophisticated metering and tariff options can have an even greater effect. Smart metering is necessary for accurate billing and for customers to understand their actual water consumption in real time and reduce usage accordingly. It could also help them to identify hidden leaks faster than they might otherwise. It gives water companies valuable insight into water usage patterns and help them to plan for future consumption and explore new conservation messaging and tariff options.

Metering is becoming the standard in water charging, but there is still a long way to go before metering becomes universal. Following current plans, smart meter rollout would only just reach over the three quarter mark (76%) by 2050. Given the expected increased demands on water and increased likelihood of drought, action on reduced water consumption is needed sooner rather than later.

To accelerate rollout, metering should be made mandatory everywhere, not just for water stressed areas. The National Infrastructure Commission recommended such a change in 2018, however this has not yet happened. As a transitional arrangement while metering is rolled out, it could be possible to install meters but provide households with a grace period where they are not charged based on the metering, in order to limit immediate changes to bills.

We note that metering may be more difficult or not practical to install in all situations, such as older blocks of flats where there is a shared water supply. In these cases, it may not be feasible to fit a meter.

Regulations need to encourage tariff innovation, not stifle it

Water pricing and innovation is largely ruled by the regulator. While the regulator's role is necessary in ensuring a fair deal for consumers, it needs to pursue this objective with a recognition that fostering a culture of experimentation and innovation can be better for consumers in the long run, even if it leads to short term differential treatment.

Review the Revenue Forecasting Initiative with a view to minimising potential penalties on water companies for adopting tariffs with higher revenue volatility

As described in chapter four, the Revenue Forecasting Incentive (RFI) mechanism is used to incentivise the effective forecasting and recovery of revenue, within a margin of error of 2%. If a company goes beyond this threshold, it can face financial penalties, with the maximum penalty applied if the difference in revenues exceeds 3%.

Forecasting, while not an exact science at the best of times, can become even more complex with the use of more detailed consumption-based tariffs. As a result, revenue can be more volatile, and more likely to fall outside of the permitted range. Greater leniency is given with respect to trials of new tariffs, but this flexibility would not apply if the entire tariff structure was to change. Given water companies' desire not to breach the threshold and be met with the penalty, fear of doing so could hold them back.

To encourage the adoption of newer tariffs, such as an RBT, the RFI mechanism would likely need to be reviewed to assess whether it is appropriate for alternative tariff structures. Widening the RFI deadband, removing penalties for under-recovery of revenue due to changes in consumer behaviour, or removing penalties entirely would help to remove unnecessary barriers to the adoption of innovative tariffs.

Update the charging guidelines to reflect the possibility of volatility

Acknowledging that it may be harder to accurately predict future revenue, Ofwat's charging rules also need to allow for some volatility. This should be further supported by an update to the UK government's charging guidance to Ofwat, which currently makes reference to ensuring "stable and predictable charges" for household customers.134 Similarly the Welsh government's guidance to Ofwat notes the importance of stability and predictability of water bills, which should "not change markedly from one year to the next".135 While charges should always be transparent and consistently applied, the introduction of more dynamic pricing with differing marginal prices suggests a different interpretation of "stable" – stability under new tariff models will depend to a large extent on customers' behaviour. There is further scope to distinguish between reasons for revenue volatility. For instance, some volatility could be attributable to maintaining bill stability between years, by deferring revenue recovery in order to smooth bill profiles, or due more to unexpected changes in behaviour. Charging guidelines should be updated to reflect this. Charging guidelines on bill stability and predictability (currently 11c in the guidelines) should be amended, as having different marginal prices for water is in tension with bill predictability. This could be reworded to "consistent and transparent application". While Ofwat needs to update the charging guidelines, this would be facilitated by the UK and Welsh governments updating their official guidance to Ofwat, which currently emphasises stability and predictability in charging.

Amend principle of cost reflectivity

Finally, the principle of cost reflectivity in the Charging Principles guidance should be amended to specify that rates do not necessarily need to reflect costs of supply for individual households. As has been previously outlined, the purpose of the RBT is not to reflect the marginal cost of water, but to encourage water conservation practices, through charging higher amounts for excessive or discretionary water use. Specifically, potential areas for reform include:

- Charging rules 14 – “Charges for services provided to domestic premises must be fixed so that the average difference between metered charges and unmetered charges only reflects any differences in the costs of, and the additional benefits of, the provision of one service relative to the other.”
- Charging rules 15 – “Differences between charges for services provided to larger users of water and charges for services provided to smaller users of water must only be based on cost differences associated with differential use of network assets, differential peaking characteristics, different service levels and/or different service measurement accuracy.”

Without an update to these guidelines, moving forward on tariff reform in a meaningful way will be difficult to implement. At the very least, updating the cost reflectivity principle will be important to clarify how new tariffs will meet this criterion and reduce the potential for disputes over the interpretation of cost reflectivity.

Since government guidance to Ofwat emphasises stable and predictable charges, the UK government should update its guidance to reflect a relatively more pro-innovation approach to charging rules. Doing so will facilitate a strong amendment to Ofwat’s charging rules as described above.

Encourage water conservation practices through targeted information campaigns and billing practices

As described in chapter two, even with tariff reform, price will only go so far to reduce the amount of water consumed. Independent of price responsiveness, households need to adopt more conservationist habits and attitudes in their approach to water consumption. Water security needs to be a government priority. Government, water companies and environmental organisations should work together to co-design a national campaign aimed at encouraging individuals and households to use less water in their day-to-day lives, as well as during hotter and drier months. This should be spearheaded by government to underline that it is a national policy priority.

There has been recent progress in this area, as Ofwat has allocated £100 million to a ‘Water Efficiency Fund’ comprising two main streams, one of which is to support a national campaign aimed at demand reduction.[136] This presents an ideal opportunity to increase collaboration between companies on water demand reduction and implement some of the measures we have discussed above. If tariff structures are reformed, and there is greater understanding of household characteristics, this information could be used by water companies to compare average use across similar household groups, and to provide tailored advice that is more specific to household circumstances.

In particular, billing is an ideal opportunity to deliver important messaging around water conservation. In order to promote good practice among households and to maximise sensitivity to prices, water billing should be more frequent. Currently, many households only receive water bills every six months. This is likely to make behavioural change through tariffs more difficult. If, for example, a new tariff is aimed to incentivise lower summer consumption, households might struggle to remember their usage behaviour in the summer months if the bill pertaining to that period only arrived several months afterwards; this would make the household less likely to identify specific actions they could take to reduce their water consumption in future. As such, water billing at least every three months should be a key aim for the water sector as it reforms tariffs. It is true that empirical studies do not find a clear, universal demand reduction effect from increased frequency of billing, however more frequent billing is effective in speeding up the adjustment process as households learn a new tariff structure.[137]

There is also scope to use the design of bills to leverage behavioural change. Currently, only 9% of consumers report that when they received their last water bill, they “used the information in the bill to reduce my water usage”, while 28% did not pay much attention to it.[138] This on its own might intuitively suggest that there is significant room for improvement on how much water bills influence behaviour. Previous trials of alternative bill messaging strategies lend some credence to this idea: a trial of Affinity Water customers found that integrating information on per household consumption (per capita consumption is commonly used at present) and tips on reducing consumption achieved a small yet statistically significant reduction in consumption among paper-billed households.[139]

In the short term, behavioural approaches to designing bills may not yield large reductions in consumption. However, we think that in combination with increased billing frequency, it is plausible that over the long term this could help to maximise the price elasticity of water as much as is possible. Including information on the marginal price households are currently paying for their water use and how much they would need to reduce their consumption in order to move into a lower block could also be worthwhile features of water bill design accompanying a move to a different tariff structure. Particularly in the case of a rising block tariff, including this type of information in water bills could help households to adjust to the new tariff structure more quickly by equipping them with important information on how the new structure works and its implications for their bill. Indeed, some studies have found that having price information on a bill next to consumption information has increased observed price elasticity by as much as 30%.[140]

While acknowledging that more frequent billing will help customers to take action sooner, water companies we have spoken to have also voiced some concerns over greater frequency of billing. With increased billing there will be increased customer contact, implying a need for greater administrative or staffing capacity to handle the new demands. This prompts some concern from a regulatory perspective, since if more sophisticated charging systems imply higher administrative costs for water providers there is a corresponding need to reflect this in price controls. While Ofwat has produced its final determinations for 2025 to 2030 in December 2024, it could amend the price controls, which prevent water companies from covering the costs of additional expenditure. Ofwat could increase the retail revenue allowances for water companies at the end of the 2025 to 2030 period if it finds they have systematically overspent due to increase billing frequency as a result of charging reforms. As with the recommendations for the RFI mechanism and charging rules, the key issue is around reducing regulatory barriers to charging reform. Effective billing practices are in our view key to making a success of tariff innovation, as more sophisticated billing is a key component of making customers aware of their water usage and more likely to adjust their behaviour.

New data sharing arrangements

As the previous chapter outlined, extending data matching powers between public bodies and water companies could present ways of better targeting support such as social tariffs and implementing novel tariff structures. Amending Section 38 of the DEA could expand the scale and scope of data sharing in support of novel tariff structures, for example by expanding the scope of information sharing and automatic enrolment from people living in water poverty to a broader category of eligibility. Following changes to the DEA, new data sharing agreements between relevant government departments, chiefly DWP and HMRC, and water companies would need to be set up to reflect the updated lawful basis for information sharing and set out the scope of what is shared

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