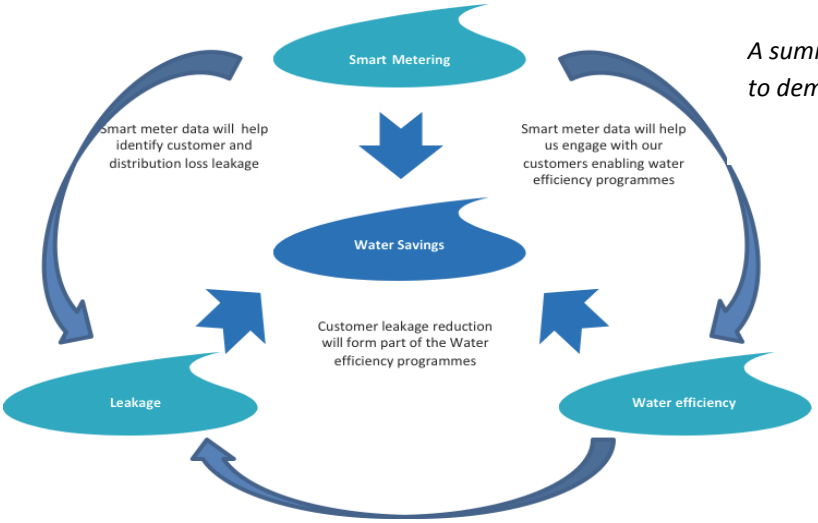
At Anglian Water, we understand that water is a precious and limited resource which is currently under significant pressure from increasing demand due to population growth, climate change, sustainability reductions and the need to increase resilience to severe drought. Less water used by customers means more water can be left in the landscape to support water quality and a flourishing natural environment.

Anglian Water provides water to over five million customers in the east of England, covering the area between the Humber and Thames estuaries. Our region has the fastest rate of housing growth outside of the South East, and has the lowest amount of rainfall at two-thirds of the national average. In an area already classed as water-stressed by the Environment Agency, this means that responsible water resource management is critical to underpinning sustainable growth and prosperity. Consequently, we are an industry leader in terms of tackling leakage and in the rollout of water meters.

Maintaining future sustainable and resilient water supplies is a significant challenge, which we have addressed in our Water Resource Management Plan (WRMP). In this, we outline a twin track approach to maintaining the balance between supply and demand; consisting of both demand management and supply side infrastructure interventions. In the near term, between 2020 and 2025, we plan to invest £250 million to manage and reduce demand for water across our region. This programme will include the first five years of a ten-year roll-out of smart meters which will support additional behavioural change and water efficiency initiatives, and reducing leakage by 23% from our existing position of having the lowest leakage in the land. By 2045 we propose to reduce our average per capita consumption (PCC) to 120 litres/person/day, at a cost of £832 million over the 25 years.

Key to our programme is our commitment to smart metering, which will be a significant factor in empowering customers to understand and change their behaviour in future, enabling a step change in communication with customers regarding their water usage and efficiency and helping us win the war on leaks. Smart metering will not only be fundamental to our behavioural change programmes, but will underpin all demand management interventions by water companies, Government and other stakeholders, including water labelling and mandatory standards, by allowing continuous monitoring and evaluation.

The scale of the challenge we face in our region means we also need to invest in supply side infrastructure, including £500 million on a network of strategic transfers that will enable us to better move water around our region, from areas of surplus to areas of deficit.



A summary of our WRMP approach to demand management:

Above all, **it is critical to recognise that reducing pressures on the country's water resources is an issue that cannot be tackled by water companies in isolation**; it will require additional support from consumers, large scale water users, developers, and property owners, and significant input from regulators and government to enable this. In summary, our response to the consultation is as follows:

- **Anglian Water fully supports the Government's aim of reducing household water consumption, in order to increase the resilience of water supplies, whilst leaving more water in the natural environment.** This is particularly important in the east of England, which is the driest part of the country and has one of the fastest rates of housing growth even before factoring in the housing planned as part of the OxCam Arc.

- **Government policy changes would be by far the most cost-effective way to achieve the additional reductions in per capita consumption that are possible and necessary by mid-century.** Additional intervention would deliver economic benefits far in excess of their costs, saving customers money in both their energy and water bills. Government policy to stimulate action by product manufacturers, local authorities, developers, NGOs and others will be far more cost effective than water companies acting alone.

- **Government should prioritise the development and implementation of a mandatory water efficiency labelling system with progressively increasing minimum standards that should also underpin tighter Building Regulations.** Increased consumer, manufacturing, and retailer awareness will help drive water efficiency in a similar way to the EU's energy efficiency labelling system. Mandatory labelling and tighter product standards would also help reduce non-household water consumption. Voluntary labelling schemes, such as the current scheme in the UK, have been shown to be ineffective.

- **Government should revise Building Regulations policy to apply a 'fittings based' approach as soon as possible, with all fittings and appliances having to meet a certain water efficiency label rating.** The minimum label ratings allowable should be designed to achieve consumption of 100 litres/person/day or lower, with the government signalling now that standards will progressively tighten to achieve 85 litres/person/day or below in time. The existing approach based on calculated water consumption and a link with Local Plans should be withdrawn. Tighter standards in new homes can readily be achieved using existing products that meet customers' needs at little extra cost to developers. As water resource zones and water company regions are becoming increasingly interconnected, every new home needs to be built to use as little water as possible, as soon as possible.

- **Government and regulators should commit to promoting and supporting the rollout of smart meters**. 'Real time' data will be a significant factor in empowering customers to understand and change their consumption behaviour in future. It will enable more targeted interventions and enable prompt identification and rectification of leakage (CSPL; 'plumbing losses') by water companies to help meet ambitious PCC targets. The continuous monitoring enabled by smart metering will be pivotal in monitoring and evaluating all demand management interventions by water companies, the government and other stakeholders.

- **Government and regulators should work with water companies and consumers to enable a step change in attitudes to water and its consumption**. Smart metering will be crucial in being able to communicate the importance of water efficiency to customers**.**

- **Government and regulators should promote the take-up of water re-use systems.** These reduce the demand for potable mains water by providing a fit for purpose alternative, where drinking water quality is not required. Large scale developments, including potential new garden towns and strategic growth areas, lend themselves to the design and construction of community-scale, site-specific re-use schemes as systems will benefit from significant efficiencies of scale.

- **We should recognise the inherent inadequacies of PCC as a metric.** The derivation of PCC is complex involving the water balance, occupancy, behavioural demographics and weather dependency – factors over which water companies have no control. A national target may be appropriate for ease of communication with the public; however, we would be resistant to this PCC target becoming a statutory obligation, given that water companies are only one of many potential influencers of household water consumption.

Whilst fully supporting a new national 'fittings based' Building Regulations (aiming to achieve PCC values of 100 litres/person/day asap, tightening to 85 litres/person/day or less over time), this will only apply to new-build properties, and in 2050 the vast majority of our customers will live in homes that have already been built. **That is why introducing a mandatory water efficiency label is so important, together with minimum standards, as a label will lead to lower water consumption in existing housing stock as well as new development.**

It must also be noted that addressing PCC and household consumption is only one aspect of meeting sustainability and resilience challenges. **Action is also needed to tackle consumption amongst non-household users of potable water, such as hotels, offices, schools, and sport centres. Here a mandatory water efficiency label will also deliver significant benefits.** Policies are also needed to reduce consumption amongst those directly abstracting water to support industry and agriculture. In particular, there is a clear need for more onsite storage including seasonal storage by farmers to support growth in irrigation whilst safeguarding summer river flows, and in the medium to long-term for new strategic reservoirs and other supply-side options in our region in response to the challenges of housing growth and climate change.

1. Do you consider that the current approach in Building Regulations (i.e. a mandatory minimum standard for new homes but with local authorities in water stressed areas having discretion to ask for a higher standard through a Building Regulations Optional Requirement) is effective?

No

We believe the current approach is not working, and believe that:

Current planning policy and guidance prohibits more ambitious efficiency standards

The Anglian Water region, together with a number of neighbouring company areas, is acknowledged to be water stressed. However, the existing guidance does not make the tighter water efficiency standard the default for local authorities and developers in these areas, which in any case is too weak a standard. National planning policy and guidance limits councils' ability to set a more challenging standard for water efficiency and re-use, should they wish to. Guidance tends to focus on fittings within new homes, rather than water recycling and storm-water/rainwater harvesting, which can have wider benefits by limiting water use and reducing the impact on existing water recycling infrastructure. Consequently, we need to see a single, much tighter water efficiency standard to be applied through Building Regulations that applies to all new homes across England and Wales, and the link with Local Plans removed.

A more ambitious approach must be adopted

We would recommend the following:

- **The removal of the existing water efficiency standards** (125 litres/person/day and optional 110 litres/person/day) as set out in Part G of Buildings Regulations, and the link with Local Plans removed.
- **Building Regulations would instead take a 'fitting based approach'** setting out the standards to be met by every fixture and fitting, with every product and water-using appliance required to achieve a minimum mandatory water efficiency label rating (e.g. a 'C' or better, tightening to 'B' or 'A' in time). Minimum label ratings should be set to achieve a PCC of 100 litres/person/day or lower.
- **Government should signal now that Building Regulations will tighten further in future to 85litres/person/day or below** in order to drive new product development and create stronger demand for green and grey water recycling and reuse.

Mandatory water efficiency labelling should be introduced

We believe that introducing a water efficiency labeling system linked to building regulations and mandating minimum water efficiency standards would be an effective way to support a new national Building Regulations PCC target. Such a scheme would drive manufacturers to develop significantly more efficient water devices (washing machines, dish washers, shower units etc.). It would simultaneously empower consumers to make informed choices in terms of the replacement of existing white-goods and fixtures, and help reduce non-household consumption (hotels, schools, office kitchens, showers etc.) as well as household water use.

It would also be beneficial if the installation of water fixtures were to be more strictly governed by similar codes of practice and systems to those used for the installation of electrical equipment in the home, in order to ensure correct installation.

Link mandatory water efficiency standards and labelling to Building Regulations

Once the water efficiency labelling scheme for new products has been codified, this should be tied to a 'fittings-based approach' in Building Regulations that would apply to all new homes, which would simplify the regulatory framework for developers. Mandating standards for fixture and fittings in Building Regulations would be a less uncertain and burdensome way to achieve the desired water efficiency gains in new build. This would avoid the necessity for complex PCC calculation systems within regulation, which are difficult to implement and monitor for their effectiveness. Developers would simply be mandated to fit only appliances and fixtures with a certain water efficiency label rating or better.

The Energy Saving Trust has highlighted the significant reductions in household demand that could be achieved if a government-led mandatory labelling scheme for water fittings and fixtures, linked to building regulations, is implemented. Their research concluded that this approach could reduce PCC by 6.3 litres per person per day within 10 years, rising to 31.4 litres per person per day within 25 years.

The regulatory framework delivering PCC targets must be reviewed and simplified

As discussed, we would recommend that regulation should still mention the requirement to achieve 100 litres/per person/per day (tightening over time to 85 litres/person/day), but that the regulations should be focused on a 'fittings based' approach linked to the water efficiency labelling programme and introduction of minimum standards for the installation of fittings and appliances. This fittings-based approach should be mandated nationally, removing the need to demonstrate a requirement for the inclusion of higher water efficiency targets in local plans. Such an approach would minimise costs of compliance by avoiding different standards in different local authority areas, creating a level playing field for all developers.

The Government is keen to see more homes built and the simplification of planning and building regulations will help achieve this. Lower household demand will also mean that there is a reduction in the need to construct additional water infrastructure, removing potential barriers to additional growth.

Evidence completed during the review of housing standards in 2014 demonstrated that higher standards could be achieved without a significant impact on development site viability. As water resource zones and water company regions become increasingly interconnected, all new homes need to be as water efficient as possible.

Monitoring and other issues

Key to the implementation of these standards is the effectiveness of how they are enforced and monitored, specifically in terms of fittings installation. It has, so far, proven difficult to validate the effectiveness of the installations in reducing resultant household PCCs. Additionally, evidence currently suggests that new-builds, even when they are rated at 125 litres/person/day or 110 litres/person/day, have not achieved these expected PCC rates, as new-build customer demographics and behaviours have either not changed, or have in effect counteracted the way savings were expected to be realised. Smart

metering and the detailed data it will provide, will be vital in validating the impact of the installation of water efficient fixtures and fittings in new-build properties over time.

Developers also indicated in the recent 'Bricks and Water' report that current regulations, which try to provide details on how to achieve PCCs (PCC calculators), are too complex to implement and monitor, and are 'gamed' by developers. For example, where high usage power showers are fitted, other highly efficient water appliances/fittings are installed to balance this out, which are then removed by the householder leading to the PCC standard being missed soon after occupation.

New-build properties will form only a portion of our housing stock (23% by the end of 2045, see table below), and so the implementation of new-build standards, whilst vital, can only ever form part of the overall strategy. Building regulations need to be supported by mandatory water efficiency labelling for appliances, fixtures and fittings, progressively tightening product minimum standards, smart metering, and behavioural change programmes.

Year	2019/20	2024/25	2029/30	2034/35	2039/40	2044/45
Total AWS Properties (Water) – (000)	2012.247	2192.499	2316.926	2415.172	2499.390	2585.643
Additional New Properties per AMP –(000)		180.252	124.427	98.246	84.218	86.253
Cumulative New Properties – (000)		180.252	304.679	402.925	487.143	573.396
Proportion of new properties per AMP		8%	5%	4%	3%	3%
Cumulative proportion of new properties		8%	13%	17%	20%	23%

WRMP New-Build projections for Anglian Water per AMP and cumulatively (5 year planning cycle):

2. Do you consider that the current minimum standard of 125 litres per person per day and optional requirement of 110 litres per person per day should be changed, and if so what might be an appropriate new standard?

Yes, the minimum standard needs to be tightened

We believe that the existing standards of 125 litres/person/day and optional 110 litres/person/day, as set out in Part G of Buildings Regulations, should be removed. Instead, Building Regulations should require all new homes in England and Wales to be built with fittings and appliances that meet a certain water efficiency label rating or better. Minimum label ratings should be set to achieve water use in new homes of 100 litres/person/day (tightening to 85 litres/person/day over time). The link with Local Plan policies should be removed to create a level playing field for developers and consistent standards across the country.

This would ensure that there is a wholesale improvement in water efficiency across the country. Most local authorities in the east of England have already specified 110 litres/person/day in their Local Plans, so we would want to see the government use this opportunity to not simply embed what is already common practice in our region. The government should commit to a future review of the new building regulations to promote continuous improvement over time, as the evidence base increases. The government should signal now that they intend to tighten the standard to 85 litres/person/day over time, in order to drive further product innovation.

3. Are there any other issues relevant to using Building Regulations to set water efficiency standards that the government should consider?

- Consideration must be given to the implications of revised building regulations on Local Plans. We would expect revised building regulations to override water efficiency requirements in Local Plans that are either adopted, or in the process of being adopted.

- Design standards for a water efficiency labeling scheme will need to be carefully considered, monitored and reviewed. For example, current cistern designs for dual flush toilets, which are intended to reduce demand, have in fact proved to be a serious issue. This is because of how quickly after installation parts can fail, how often this occurs, and the scale of the leaks they cause. The 'leaky loo' water losses can be very significant, around 20 litres every hour, or on average 478 litres per day.

- As more water efficient appliances and fittings become available, driven by the water efficiency labeling scheme, they will, through replacement, eventually permeate the entire housing stock; as energy efficient light bulbs have become common place on the UK market. Over time, as appliances/fittings are replaced, these water efficient goods would become the norm, leading to significant reductions in water consumption.

- Monitoring and measurement of PCCs for new-build developments is currently limited by the frequency of meter readings. However, current evidence indicates that new developments are not necessarily achieving PCCs in line with developer commitments. Much more information will be required to validate future policies. Smart metering will provide a platform to provide this detailed consumption data and we urge government to prioritise their roll out.

4. To what extent do you agree or disagree that Government should work with water companies and local authorities to run partnership retrofit and behaviour change programmes in existing homes?

Strongly agree.

We strongly agree that retro-fit and behaviour change programmes driven by multi-sector partnerships are an excellent vehicle to deliver change.

Anglian Water has historically pursued an active policy regarding water efficiency with our 'Bits and Bobs' audit and home visit programme. These visits aim to deliver water savings by fitting free water saving devices and through the provision of advice, to encourage positive behaviour change. Additionally, we are continuing to run our 'Drop 20' campaign. 'Drop 20' is a water efficiency campaign which we developed in response to the 2011-12 drought and we continue to offer it to customers when they request a meter.

The installation and retrofitting of water saving devices is an area which could also be partnered with other organisations with housing stock interests, including housing associations and local authorities.

In our WRMP, we have developed an incentivisation programme to help to identify and replace 'leaky loos', providing rebates to customers for toilet replacement. As mentioned, 'leaky loos' losses can be significant (478 litres a day) and add considerably to customer bills and consumption. Additionally, we intend to offer incentives for the purchase and installation of water butts to reduce consumption for

garden use. While these schemes have both been successful, they will no doubt benefit from government partnership to support a more widespread rollout across the country.

It is also crucial to engage with the retail water sector, following the opening of the competitive market in 2017. Business water retailers and non-household customers are not covered by this consultation but account for a significant proportion of national water demand. Therefore, government must engage with them on demand management. Retrofitting of water efficient devices could also, therefore, be partnered with relevant government and private stakeholders (hospitals, schools, universities and halls of residence, nursing homes etc.)

A single, clear messaging strategy will be critical to change attitudes towards water usage and to modify behaviours. This should be designed and co-ordinated by all interested stakeholders, including water companies, government departments, local authorities and other interested NGOs, to form a clear and coherent message to the public.

5. To what extent do you agree or disagree that information on water efficiency should be displayed on water using products?

Strongly agree

We strongly support the idea that a water efficiency labelling scheme should be developed and mandated by government regulation – as discussed in our response to Q1. Voluntary labelling schemes, such as the current UK scheme, have been shown to be ineffective.

Additionally, if the installation of water efficient fixtures and fittings were to be mandated in building regulations, this would be an effective and simple way to achieve desired reductions in consumption in new-build developments. Fittings, fixtures and appliances must include the following:

- Showerheads, eco-showerheads, aerated showerheads
- Bath, eco-baths
- Taps, reduced flow taps
- Toilets, dual flush, reduced flush toilets
- Washing machines
- Dishwashers
- External use sprinklers, hose guns, garden irrigation systems, domestic pressure washers

This scheme must be closely aligned with the current 'energy efficiency' labelling programme, with communication strategies aligned to show the interactions between and benefits of saving water, energy and reducing carbon emissions.

We urge the government to act upon the recommendations highlighted in the Energy Saving Trust report (as in Q.1):

- Review existing schemes to assess current product ratings, testing methods, product data.
- Identify priority product groups for early implementation.
- Determine label rating matrices and minimum standards for each product group.
- Review product performance testing methodologies for fitness for purpose.
- Decide whether label declarations will be based on 3rd party or self-declared product testing.
- Agree labelling obligations of different parties.

- Research user needs and preferences for label design and content.
- Determine bodies responsible for monitoring and enforcing compliance.
- Review existing legislation (e.g. energy labelling) for suitability as template for water labelling regulations.
- Work with stakeholders to develop engagement strategy.
- Consider development of central body of shared marketing resources.

Smart metering and the potential for linked intelligent smart products ('the internet of things') will offer a platform to provide detailed consumption data to validate future policies and evidence reductions in PCC.

6. To what extent do you agree or disagree that providing information about products' water efficiency changes peoples' purchasing behaviour and reduces their use of water?

Strongly agree.

Ordinarily, consumers are not overly concerned about water efficiency given the reliability of the supply service and the low bill cost. This is why progressively increasingly minimum standards taken together with a water efficiency labelling system are so critical in changing behaviour. It is the combination of mandatory labelling and minimum standards that is important.

7. To what extent do you agree or disagree that water efficiency labels should be linked to building standards and minimum standards?

Strongly agree.

We strongly support the idea that a water efficiency labelling scheme should be linked to mandated minimum building standards and building regulations. We would be keen to assist with the development of this policy, in partnership with developers and product manufacturers, in order for it to be introduced as soon as possible.

In addition to the aforementioned Energy Saving Trust report, the Bricks and Water inquiry states:

> *'We would recommend the introduction of water efficiency labels for new products, based on the European Water Label. This should be linked to building standards under a 'fittings based approach', making it much easier to calculate a building's overall water consumption. This approach could also be incorporated into minimum standards going forward, such as the Future Homes Standard.'*

It has currently been estimated that a government-led mandatory scheme linked to building regulations and minimum standards would reduce per capita water consumption by 6.3 litres/person/day within 10 years, rising to a saving of 31.4 litres/person/day after 25 years. This would enable a significant reduction in PCC, above and beyond that currently modelled in our WRMP (120 litres/person/day by 2045).

We, therefore, consider that the implementation of a water efficiency labelling scheme should be prioritised by government, in order to enable a 'fittings-based approach' to future building regulations. This would complement a smart meter rollout, to support behavioural change programmes (as pioneered by Anglian Water in the Newmarket trial and included in the Anglian Water WRMP). This will

provide valuable detailed data on consumption validating future new-build PHCs and PCCs, whilst further driving changes in behaviour.

8. How else could government or water companies encourage people to use more water efficient devices/appliances at home?

It should be noted that it is currently difficult for customers to understand how much water they use, what is considered average, and how to reduce consumption. Therefore, government and water companies should work on:

- Coordinated communication strategies and feedback from water companies to counter this lack of awareness.
- Gathering more data through smart metering. Smart metering will provide a wealth of information to customers and this should be communicated clearly, enabling customers to understand their consumption relative to similar users and their neighbourhood. This communication should be accompanied by 'tips' on water efficiency and incentivisation programmes.

9. To what extent do you agree or disagree that people should pay for water according to how much they use?

Strongly agree.

We believe that metering is the fairest way to charge for water because customers only pay for what they use. The results from multiple sources and our own consultations show that customers support this, as being the fairest system for paying for water.

It has been found that customers who are metered and billed on their measured usage generally use less water than customers who pay an unmeasured estimated charge (this saving has been derived to be approximately 15%). Currently (2018/19) we have approximately 83% of our customers paying a metered/measured charge. Water companies offer a range of measures to support households that struggle to afford their bill.

10. To what extent do you agree or disagree that the amount of households charged by metered volume should be increased beyond and/or faster than what is already planned by water companies?

Strongly agree.

We strongly agree that meter penetration should be increased and accelerated for the industry as a whole, especially where meter penetration is currently low. The benefits for customers switching to meters are well documented; specifically with respect to the reductions in bills and PCC. As water resource zones and water regions become increasingly connected, it is important for every household to use as little water as possible. Metering programmes take many years to deliver, so should be begun straight away in order to achieve close to universal metering in the 2030s.

It should be noted that Anglian Water currently has one of the highest rates of meter penetration in the UK. In the current year 2018/19, we have over 91% of household properties with installed meters and 83% of customers paying measured charges.

Consequently, whilst we continue to increase our meter penetration towards the theoretical maximum (approximately 95%, accounting for the technological and accessibility difficulties of reaching the final customers), we as a company are now focused on the next phase of metering, by introducing universal smart metering.

As part of this programme we intend to replace all of our dumb meters with smart meters from 2020 to 2030, with plans for over 2 million smart meters to be installed by 2030. In support of our smart meter programme, we have been trialling smart meters in two areas of our region (Newmarket and Norwich). These technologies allow granular hourly data reads for our customers. We have found that smart meters enable additional savings for customers (savings have been estimated at >3% for PCC reductions and >3% in Customer Supply Pipe Leakage (CSPL)).

Given our current leading position, we support the vigorous introduction of smart metering programmes and would support measures to assist our 2030 goal.

11. If you agree that the amount of households charged by metered volume should be increased, what do you think would be the best or most appropriate approach? Do you have suggestions for increasing metering other than what is mentioned above?

We believe the best way to increase metering penetration is through an 'Enhancement' or 'opt in' approach. This programme involves customers being given the opportunity to opt-in to being measured, utilising meters that have been systematically pre-installed for customers across the region. Customers are automatically switched to paying a metered charge, upon a change of occupancy, where a meter is in place.

Our 'Enhancement' programme will enable us to reach our theoretical maximum for meter penetration (approximately 95%, accounting for the technological and accessibility difficulties of reaching the final customers) in the next 15 years.

We, therefore, consider an 'Enhancement' approach, combined with a national communications strategy coordinated by government, to convince customers of the benefits of switching (i.e. - lower consumption, bills and environmental benefits) to be the best way of increasing the number of billed measured customers over time.

12. Are there any other issues we need to consider with regard to increasing metering?

Vulnerable customers
Whilst designing metering strategies, we must be mindful and protective of vulnerable customers. For example, some may be high water consumers due to medical reasons or have financial difficulties. However, these customers should still pay a metered bill to encourage water efficiency but be offered support and discounts through water company affordability schemes.

Regulatory support
Water companies are regulated by Ofwat, who need to agree to the expenditure required to deliver the step change in metering, and smart metering that is necessary to achieve Government's broader aims. This should be unambiguously prioritised by Government in its guidance to Ofwat.

Technical challenges in reaching full meter penetration

Reaching full meter penetration, beyond the theoretical maximum (approximately 95%), will encounter significant obstacles. These include customer acceptability (as there will always be a small number of customers who will resist having a meter), and installations into inaccessible locations and properties.

There are particular challenges for water smart metering including the potential location of the meter; in that water meters are mostly, in the road, without a readily available power source to generate a signal. External meters will, therefore, require their own power source (battery), and the location (underground in the road) may impede the transmission of accurate data.

Technological change

Technology develops at a rapid rate meaning obsolescence of existing technologies needs to be considered in any programmes. Geographical rollout of contiguous areas will offer some protection against this, as technology can be replaced systematically, rather than on an ad hoc basis. Future changes in communication technology or in smart meters will need to be incorporated into the meter roll-out programmes, area by area, as they are progressed.

Smart meter opting in/out

The time it takes to roll out smart meters across a large geographical area is a key point to consider. This means that some areas will not be smart metered until a later time in a roll-out programme, as the experience with smart energy meters will attest. This may result in some customers who actively want a smart meter, feeling disenfranchised, having to wait longer than they would like.

Alternate technical solutions to this problem will be needed to enable these customers to opt in and be properly satisfied. Home WiFi should be considered, but issues still arise from the fact that meters will be outside the home, underground and on battery power. This technology may be possible in future, but it is extremely unlikely in the near future.

Consideration must also be given to the impacts of GDPR on smart metering. Water companies will need to give customers the option to opt out or companies must actively seek customers' permission to store the data.

Customer acceptability

In order to improve smart meter perceptions among the public a clear coordinated messaging campaign is needed. This must focus on the aforementioned benefits of smart metering and must build on the considerable consumer acceptance of being able to understand consumption and have smart meter data.

13. To what extent do you support or oppose use of smart water meters instead of manual meters?

Strongly support.

As discussed, Anglian Water has one of the highest rates of meter penetration in the UK.

Smart meters are a key ingredient to achieving significant PCC reduction. With 'real time data' from smart meters, leakage and behavioural interventions can be correctly targeted. We believe that these new technologies can enable a step-change in the understanding of consumption by our customers and ourselves, and drive changes in attitudes and behaviour towards reduced water usage. **Smart metering**

will underpin all demand management interventions, by water companies, the government and other stakeholders, including water efficiency labelling and mandatory standards, by allowing continuous measurement and validation, as new measures are introduced.

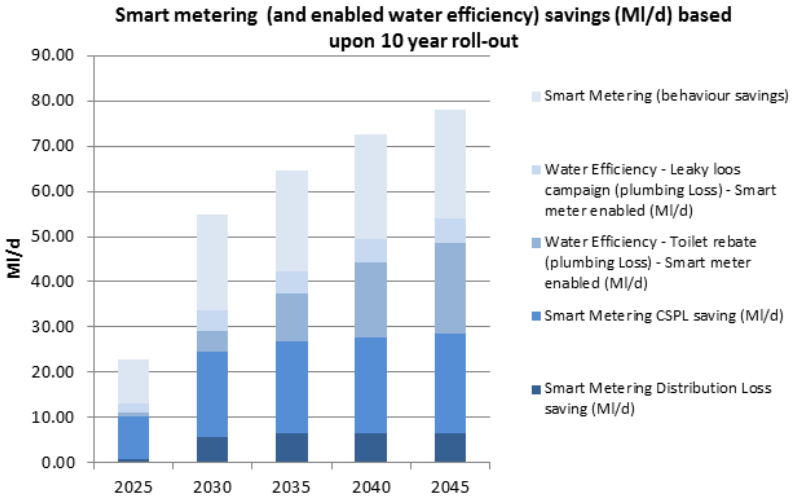
In order to be able to drive behavioural change, customers need to understand consumption in a much more dynamic 'real' time fashion. If we can share detailed data with them immediately, it will allow customers to understand their daily usage (understanding peaks and troughs and identifying leaks). It will also allow comparison with neighbours and other similar customers (potentially allowing 'nudges' to social norms regarding water usage). Additionally, it will allow a transformation in how we are able tailor our communications and assistance in helping customers reduce demand, whilst enabling a wider conversation about water and the natural environment. We are, therefore, actively developing communication strategies and behavioural change approaches, including concepts, such as a 'social contract' between ourselves and our customers incentivising responsible water usage and showing the benefits to the individual, community and environment.

As part of our WRMP, we have therefore proposed to replace our entire stock of 'dumb' meters with smart meters over a 10 year period (over 2 million meters), reaching the limit of feasible meter penetration (95%) by the end of 2030. Consumption data will be provided daily to customers through a dedicated website (or 'customer portal') and via 'Mobile Apps', which will be developed as meter installation progresses.

The central imperative which drives our 'smart meter' option is the generation of data for our customers. Smart meter systems must, therefore, be robust and must be able to supply accurate and reliable data over the long term. Reliable data will enable water companies to build a new relationship with customers, in which we can assist them to make informed choices regarding their behaviour and their water consumption.

Additionally, smart metering will:

- **Reinforce current water savings** as customers become metered and measured (15% efficiency for standard metering) and unlock the potential for additional water efficiency measures in a mutually reinforcing way (saving an additional 3%).
- **Facilitate significant leakage reduction** through the more efficient and timely identification of leaks. This included internal 'plumbing losses' (PCC) and customer supply pipe leakage. This identification of leakage will inform water company home visits, adding significant value to our water efficiency activities.

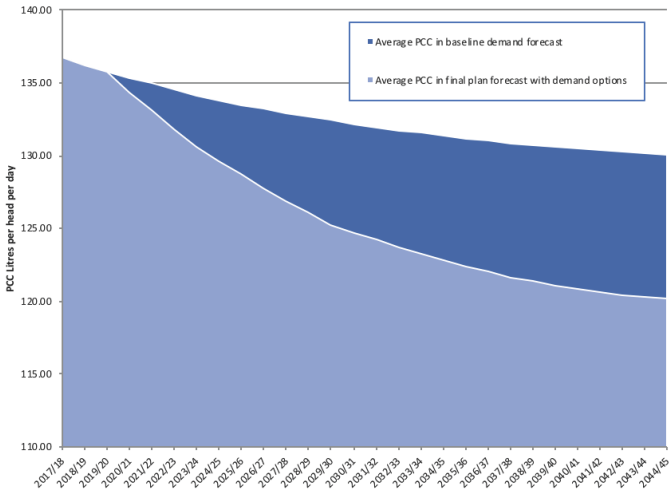


Savings attributed to smart metering (Ml/d) and associated water efficiency programmes over the WRMP period to 2045.

Note that smart metering enables savings both behaviourally and from the detection of leakage (CSPL, distribution and plumbing losses)

By the end of 2024/25, we estimate that smart meters will result in up to 9 Ml/d behavioural demand savings, and up to 9 Ml/d reduction in customer service pipe leakage. By 2045, we estimate smart meters will result in up to 24 Ml/d behavioural demand savings, and up to 28 Ml/d reduction in CSPL and distribution losses.

Smart metering and the potential savings it will unlock (water efficiency, behavioural change and the rectification of plumbing losses and 'leaky loos') will form the core of the changes in PCC currently forecast in our WRMP, reducing PCC by an additional 9.85 litres/person/day beyond that achieved with the introduction of standard meters, from 130 litres/person/day to 120 litres/person/day by 2045.



The impact of our WRMP demand management strategy (smart metering and water efficiency) on average per capita consumption (PCC) – 2018-2045

Note that baseline PCC reduces as meter penetration increases (even without the addition of smart metering).

Research from Water UK/Artesia (Pathways to long-term PCC reduction) also recognises the central role smart metering has to play. As such, all metering options included in Artesia's report are 'smart', because the case in favour of them is so overwhelming.

Additional information regarding our evidence based modelling for smart metering can be found in our WRMP 2019 Technical Document: WRMP and demand management strategy.

14. To what extent do you support or oppose use of incentives to encourage customers to use less water?

Strongly support.

At Anglian Water, we believe that an important part of managing demand is empowering customers to control and reduce their water usage. Consequently, we have a dedicated water efficiency team that leads our work in this area.

Key to our water efficiency work is our 'Bits and Bobs' audit and home visit programme, and 'Drop 20', as mentioned in Q4. These visits aim to deliver water savings through the incentive of retrofitting free water saving devices and through the provision of advice, to encourage positive behaviour change. These should be accompanied by a partnership programme of retrofitting water efficiency devices (see Q4).

The success of smart metering will also influence our water efficiency activities. We understand that the technological revolution of smart metering will need to be accompanied by a behavioural revolution to unlock its full potential. We are excited by the opportunities that the provision of timely and detailed

consumption data from smart metering could have on our ability to change consumer behaviour and promote conservation of water. In parallel to our smart meter roll out we are actively developing communication strategies and behavioural change approaches, including the concept of a 'social contract' between ourselves and our customers incentivising responsible water usage and showing the benefits to the individual, community and environment.

15. What incentives could water companies use to reduce customer use of water?

There are number of measures water companies can take to incentivise consumer reductions in water:

- **Incentives for customers to replace leaky toilets** with more efficient brands (A-rated water efficient brands). This programme helps customers identify 'leaky loos' and provides them with rebates for toilet replacement that helps improve efficiency, whilst also tackling plumbing losses.
- **Offering incentives for the purchase or installation of water butts to mitigate consumption for garden use.** We plan to provide and install water butts to a number of our customers, and to develop a standard 'blueprint' for sustainable gardens.

Incentivisation through new technology

Further initiatives to consider include drawing upon insights from behavioural economics, which are enabled by smart metering and online platforms (Web-based and mobile applications). These platforms will be designed to give clear information to customers regarding their usage, potential methods of saving water and potential benefits. Customers could be rewarded for signing up and using the portal.

There is also the **potential to align other utilities to make the most of new technologies**, for example, the development of a 'multi-utility consumption portal. Additionally, future technological development may allow the **integration (and retrofitting) of 'smart devices'** (appliances, taps etc.) to send data for inclusion and analysis within the 'smart portal system.

Working with land developers

We believe that there are significant opportunities to work with house builders to promote sustainable developments and water efficiency, such as:

- Offering developers an incentive to build homes to below our proposed standard of 100 litres per person per day, by refunding part of the charges they pay to connect homes to our network.
- Promoting 'green water' initiatives (designated as non-potable rainwater, storm-water, or recycled water) involving simple solutions (e.g. water butts) and encouraging developers to install more complex 'green' water systems into new homes at an individual household and community scale.

16. To what extent do you support or oppose the use of RWH and GWR schemes at an individual level?

Strongly support.

We strongly support the implementation of water re-use systems for individual properties where feasible. We are, therefore, liaising with local authorities, developers and other relevant stakeholders in order to develop and trial these options in the Anglian Water region. However, more needs to be done by government in order to give stakeholders more certainty in embracing water reuse technologies.

Water re-use systems can reduce the demand for potable mains water by providing a fit for purpose alternative where drinking water quality is not required. These systems also help manage water on site, and reduce the impact on downstream drainage infrastructure. Both individual and community scale systems will, potentially, be needed to achieve deeper reductions in water consumption and also improve standards of local flood resilience.

It is important to recognise that that these systems do not necessarily reduce PCC, but can displace demand for potable water (supplied by water companies) with alternate non-potable sources (rainwater, grey-water and black-water).

It is also noted that these systems introduce added complexity with increased risks to water quality due to cross contamination with systems that are either poorly maintained or altered after installation. There potentially will be an increased burden on water companies to monitor dual-supply properties to ensure water quality is not compromised over time. However, these challenges can be overcome.

17. To what extent do you support or oppose the use of RWH and GWR schemes at community scale?

Strongly support.

We strongly support the implementation of community scale water re-use systems. We are currently liaising with local authorities, developers and other relevant stakeholders in order to develop and trial these options in the Anglian Water region. However, these efforts are hindered by lack of policy certainty, promotion, and incentives from central government to encourage their take up.

We would suggest that these options be referred to as 'water re-use' schemes, as rain water harvesting (RWH) and grey water recycling (GWR) are only referring to a couple of specific options, out of a wide range of potential possibilities. In particular, there may be other more appropriate solutions for large scale community schemes or for particular sites, for example storm-water harvesting (capturing, treating and reusing surface water runoff) and black water recycling.

As part of our vision for a sustainable future we are also focused on promoting our 'green' water initiative (green water being designated as non-potable rainwater, storm-water, or recycled water), which involves liaising with developers to install more complex 'green' water systems into new developments.

Large scale developments, including potential new garden towns, former military sites and strategic growth areas, lend themselves to the design and construction of site specific re-use schemes that can benefit from efficiencies of scale. These schemes would not only be potentially beneficial with regard to demand reduction, but could also be advantageous in terms of flood mitigation, water quality improvement, and natural capital enhancement.

18. How can government or water companies most effectively encourage people to re-use water in their homes?

We recommend the government to take the following actions to encourage greater water reuse in the home:

- **Update building regulations in order to encourage water re-use systems**. This includes a signal now that water efficiency requirements in new build will tighten in time to 85 litres/person/day.

- **Change regulations to allow water companies to adopt, own and operate community scale water reuse systems**. This would allow water companies to supply non-wholesome water to customers, as a secondary supply for non-potable use, which is currently not possible.

- **Ensure consistency across the relevant regulations (Building Regulations, Water Supply and Fittings Regulations and standards etc.)**

- **Expand the British Standards and other guidance to include the requirements/considerations for a broader range of water re-use options** (beyond just RWH and GWR, in particular those that may be more appropriate at a larger scale). Include clear water quality standards that cover different water re-use systems and end uses

- **Normalise water re-use systems (specifically rainwater harvesting and storm-water harvesting) as part of a SuDS management train**, allowing the design and installation of multi-functional water management systems (such as water re-use and flow attenuation); for example, rainwater and storm-water harvesting on site could be included at the top of the drainage hierarchy.

Work carried out by the WSBF and the Behavioural Insights Team at the Anglian Centre for Water Studies at UEA indicates that a clear messaging strategy would be required in order to change attitudes towards these technologies and foster wider public acceptance. This messaging strategy should be designed and coordinated by all interested stakeholders, including water companies, government departments and local authorities and other interested NGOs.

19. Do you have any evidence/views/comments on the potential impacts on water bills for various customers and geographical regions should the management of supply pipes be transferred to water companies?

We believe the current arrangements for managing supply pipes are appropriate, but that there is room for improvement with advances in innovation and technology.

It is not financially viable under current water company funding mechanisms for companies to be responsible for fixing all customer supply pipe repairs. Some companies do offer repairs to CSPLs, but only where it makes business sense to carry out the repair. It is important to note that this is subsidised by income from all customers (whether or not they have a leak), so there is an issue of fairness that needs to be addressed.

Any changes must be consistent across the industry, as currently policy variations means that customers are not always sure where responsibility lies.

Major reform regarding supply pipe policy would involve:

- Who has responsibility for suitable flow and pressure.

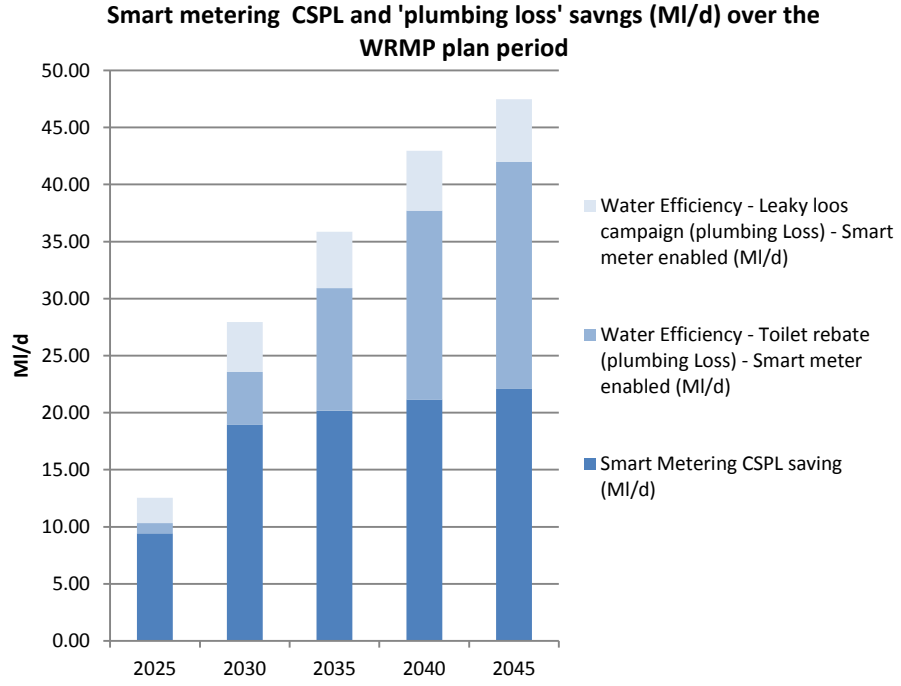
- The effect of over-building and third party damage to CSPL, including existing known problems in pipes or the ground in which they are laid.
- How joint supply pipes and other more complex arrangements can be facilitated.
- Definition of supply pipes in terms of diameter and length (household, non-household).
- Powers of entry to customer's land and liability for re-instatement.
- Ability to manage drinking water quality, leakage, low pressure issues would be managed.
- How vulnerable groups of customers might be protected.
- Clarity of messaging to customers.

Above all, adoption would be costly, as water companies would need to bring the new assets up to minimum industry standards, and funding would need to be made available through the Price Review process. There would be significant issues in defining boundaries and policies exclusions, including how to deal with very long supply pipes and pipes under structures.

The best way to achieve the leakage reduction benefits that ownership transfer could provide is through the roll out of smart meters. The data would enable interventions at a much lower cost than wholesale transferal of ownership.

20. Of the alternative options above, which is your preferred? Please explain why or if you have other ideas.

Key to the detection of 'customer supply pipe leakage' and 'plumbing losses' is the availability of continuous flow data. This will be best gathered through the widespread roll out of smart meters. Hourly smart meter reads will be able to detect continuous water flow at night time, when customer usage is minimal, which typically indicates a leak. Smart meters are, therefore, key in identifying both CSPL and 'plumbing losses':



Smart metering unlocks the potential to identify both CSPL and 'plumbing losses'.

This has been modelled for our WRMP demand management strategy.

Observed reductions in consumption due to the elimination of CSPL and plumbing losses in the Newmarket smart metered trial (2018) have been found to be between 20 and 26 litres per property per day. Of this reduction, the majority, 15 and 20l/property/d, is attributable to 'Plumbing Loss' or CSPL

reductions and, the remainder, between 2 and 6 l/property/d from changes in behaviour (note this behavioural change has occurred without a sustained water efficiency communications program).

21. What other options are available to reduce leakage from customer supply pipes?

As highlighted, continuous flow data from hourly smart meter reads will allow a fundamental change to our ability to detect customer supply pipe leakage and plumbing losses.

The availability of night-time 'continuous night flows' data will allow the detection of flows when customer usage should be at a minimum or zero, which typically indicate leaks in the system. Smart meters will provide this real-time data and enable the efficient identification and rectification of these leaks.

In addition, we are planning to install fixed noise loggers across a significant proportion of the network which will also pick up leaks both on the customer supply pipe as well as the water company network. We are also planning further pressure management. As pressure is decreased (within tolerances) in the network, this reduces leakage losses, including those attributable to CSPL.

22. What are the main barriers to changing behaviours to reduce personal water use? Please rank your top three options by order of importance:

a. Insufficient access to support and advice
b. Insufficient information about personal water usage
c. Insufficient information about water scarcity
d. Lack of financial incentive
e. Investment in more water efficient equipment is prohibitively expensive
f. Difficulty in changing habits
g. People feel they are already doing all they can to reduce water use
h. Hygiene reasons
i. Other (please specify)

In order, we consider the main barriers to be:

b. Insufficient information about personal water usage

For customers to be able to change their water usage behaviours in future, they need to know how much water they actually use. Therefore, 'real time' data from smart meters is critical to empowering consumers.

If we can share detailed hourly data, immediately, it will not only allow our customers to understand their usage in 'real time' (understanding peaks and troughs and identifying leaks), but it will allow comparison with neighbours and other similar customers (potentially allowing 'nudges' to social norms regarding water usage).

Additionally, it will allow a transformation in how we are able to understand individual customers and tailor our communications and assistance in helping customers reduce demand. It also enables a wider conversation about water and the natural environment, as well as information regarding water efficiency and financial savings.

a. Insufficient access to support and advice

Despite existing water company campaigns, advice needs to be augmented with a multi-stakeholder co-ordinated strategy in order to reinforce information. Not only on how consumption might be reduced, but why this important for the individual and wider community.

Part of the challenge is identifying and understanding your customer base. Anglian Water, in partnership with Imperial College London, has endeavoured to understand our customer's attitudes to water, their bills and their usage. We have surveyed customers in detail to see how they feel about their water usage and Anglian water, producing the following groupings of customer:

- Comfortable and caring.
- Eco-economisers.
- Family first.
- Careful budgeters.
- Protective provincials.
- Tech-savvies.

These demographic and attitudinal segments will be fundamental to informing how we will tailor our 'smart meter' services and messaging to our customers. We understand that smart metering is a technological revolution that needs to be accompanied by a behavioural revolution to unlock its full potential. In parallel to our smart meter roll out, we are actively developing behavioural change approaches, including the concept of a 'social contract' between ourselves and our customers with regard responsible water usage and the benefits to the individual, community and environment.

We have also been trialling different approaches to communicating with our customers in our Innovation Shop Window in Newmarket, including using a physical high street shop to promote direct contact with our customers regarding what we do and how to be more water efficient. This direct contact has been appreciated by our customers, stressing the importance of instant feedback and guidance on their water consumption. Core feedback from customers has included the following comments:

- "Show me what to do".
- "Make me feel smart and savvy".
- "Money talks – make the challenge and benefits tangible".

Therefore, it is clear that government and industry have to take a much more active approach to communicating offers of support and advice.

d. Lack of financial incentive

A key element of residential water demand management is water pricing and financial incentives. By the law of demand, increasing water prices should reduce residential water demand. However, the current academic consensus is that demand for water is not particularly price-sensitive. Water is a relatively cheap utility and the majority of the population are not necessarily very concerned with saving water.

Currently there is only a limited scope to introduce differentiated tariffs for customers, due to the infrequent nature of the billing process (6 monthly). Additionally, under the current system, it is very difficult for customers to link behaviour and consumption directly to billing information, other than in gross terms.

However, with the introduction of the smart meter programme, we are considering how we might be able to show customers consumption and billing information in much more connected and relevant way. We want to show how customers can save water as well as save money.

We have also considered the potential to introduce tariffs which could reward reductions in demand (and potentially penalise water usage at critical times (drought)) as part of our WRMP.

However, available research and literature on the price elasticity (the degree to which price affects demand for a product or service is known as price elasticity) of demand for water has consistently suggested that household demand in our region is likely to be relatively price inelastic.

The key conclusions of the UEA research in this area are:

- Household demand is fairly unresponsive to changes in price – 'Water demand is in general price inelastic'.
- Summer demand is thought to be more price elastic than winter demand, and similarly outdoor household use is regarded as more price elastic than indoor use.
- There is evidence which suggests that having price information next to consumption information on the bill may increase the price elasticity of demand by a factor of 30% i.e. make demand more responsive to price.
- The demands of lower income households tend to be more price elastic than those of higher income households.

With the onset of smart metering and the availability of detailed consumption data, there may be more nuanced approaches to sending price signals. These approaches might include: increasing block tariffs, seasonal tariffs, time-of-day tariffs, and premium tariffs for outdoor use.

We believe that more complex price signals may have a role to play in our future demand management activities. However, there are certain preconditions to be met to enable successful pricing interventions, including:

- Alternate tariff structures would be predicated on the full introduction of smart metering, which would allow customers to understand their water usage and bill impacts.
- The scale of impact that price interventions would have in our region would need to be established.
- There would need to be confidence that changing a simple two-part tariff would have the intended consequences.

The introduction of more complex price signals would need to be part of a wider package of pricing and billing initiatives designed to inform customers and influence their behaviour in such a way as to achieve meaningful reductions in demand.

A key prerequisite for extending the use of price signals would be that customers have real-time consumption data linked to price information available to them, and that they also understand their usage within the wider context of water conservation. To effectively design price interventions, there would need to be improved understanding of customer usage patterns and particularly household occupancy. The roll-out of smart meters will vastly improve the quality of the data available regarding

consumption. In conjunction with this, engaging with customers via a web-portal, in relation to other 'non-price' initiatives, would provide a route to obtain information about occupancy.

It is clear that any price interventions need to be supported by other, non-price activities. In the future, there is likely to be a strong link between activities to promote water efficiency and the ability to successfully implement pricing interventions.

23. Which organisation(s) (if any) should communicate about how to reduce personal water use? Please select all that apply.

a. Water companies
b. Government
c. Local government
d. Environmental non-governmental organisations, for example environmental charities
e. Other – please specify

All of the above - A coordinated communications strategy showing customers the value of water, the importance of water conservation to the environment and how efficient consumption of this precious resource can help is a matter for all parties. Regulators also have an important supporting role here.

Consequently, we believe there is a role for all stakeholders to participate in getting the message across to the public, including:

- **Governmental department/bodies,** including Defra, the EA, Ofwat and other departments (the NHS, DfE, schools etc), should co-ordinate messaging about the benefits of reducing water consumption.
- **Water companies** should play a key role in communicating water efficiency strategies (noting the potential for 'tailored' communications that will be enabled via smart meters).
- **Manufacturers** and supplies of white-goods, fittings and fixtures and other goods associated with water usage, could assist with messaging on packaging and in their design.
- **Waterwise** is key to researching water efficiency measures and communicating their findings within the industry and to the wider public.
- **Water UK** is a key stakeholder in co-ordinating and developing strategies for water usage and should be a key communicator within the industry and to the wider public.
- **Local Government** should be active in driving and communicating water efficiency strategies as part of their Local Plan development.
- **The National Housing Federation and housing associations** (as major public landlords) should be active in communicating how to reduce personal water use.
- **Other environmental NGOs** (WWF, RSPB etc.) should explain the importance of water to our flora and fauna and how abstracting less water from the environment is beneficial.

Clear messaging strategies will be required in order to change attitudes towards water usage and water efficiency, driven both in the home and in education. These messaging strategies should be designed and coordinated by all interested stakeholders, including water companies, government departments and local authorities and other interested NGOs.

In order to facilitate these changes in attitudes and water usage behaviours, it is imperative that customers are able to understand the amount of water they use. This supports the implementation of a smart meter program, real time data creation and communication allowing for customers to compare

themselves with their neighbours, locality and social norms; and allow the design of effective tailored messaging suited to different demographic groups.

24. If there are any further matters that you would like to raise or any further information that you would like to provide in relation to measures to reduce personal water use, please give details here.

- **It is important to determine how best to impact peak usage in times of water stress**. Peak demand can be significantly higher than the average (approximately 30%,) and is mainly driven by weather related events; summer peaks being mainly driven by consumption (gardening etc.) and leakage increases due to ground movement, and winter peaks being driven by freeze/thaw leakage increases. 2018's peak was significant and prolonged (in the Anglian Water region it lasted approximately 5 weeks).

  How demand management and coordinated messaging can assist in moderating these peaks in future (if they become more regular with more extreme weather), will need to be considered moving forward. Evidence currently suggests that smart metering may be able to help in moderating peak demand.

- In considering the impacts of demand management and reductions in PCC, we must also **consider impacts on the waste water system from reduced volumes and flow**. Reduced flows might directly affect waste water processes, leading to an increase in blockages and issues arising from more concentrated liquors. Additionally reduced volumes at out-flows may impact the totality of catchment management. Again these factors will need to be considered and modeled, whilst planning future waste water processing requirements and catchments will need to be viewed in a holistic manner.

Additional information regarding our evidence-based modelling of demand management, water efficiency and smart metering can be found in our WRMP and demand management strategy, submitted alongside this consultation response. This document contains our detailed, in depth analysis, produced for determining the costs and benefits of our demand management interventions and PCC for our WRMP.