

Liberal Democrat Utilities Working Group: Call for Evidence – Theme: water industry regulation

Consultation response from the
Centre for Competition Policy

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This consultation response has been drafted by the named academic members of the Centre, who retain responsibility for its content.

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Executive Summary

- In general, trade-offs exist between policy objectives. The Liberal Democrats will need to determine which objectives it views as the most critical to achieve. This includes considering which issues are short-term matters and which will be most important over the long-term.
- On whether Ofwat should have statutory objectives and priorities be changed, we observe that Regulator duties have increased in number and complexity. Simply adding an additional duty to the existing list of duties is unlikely to be a helpful. If addressing climate change is seen as an overriding objective, it would be best to reassess and rationalise the full list of regulator duties.
- On ownership models, we think this is something worth investigating, especially as property rights for water in the UK are (relatively) vague. However, before any assessment, it is first necessary to prioritise the objectives the water sector is to achieve. Public ownership should not be seen as a panacea, it likely creates new issues.
- On introducing new measures to deal with resilience (specifically personal demand), we note it is important use robust cost benefit evidence to demonstrate that the interventions are the most effective available and can reduce aggregate water demand on the necessary scale. Unit pricing and behavioural interventions offer two routes to reducing demand. Trials to assess the effectiveness of social comparisons seem worthwhile.
- On targets to reduce leakage, we note there is a need to consider the value of the water lost through leaks. Leaks should only be addressed when the value of the water lost (or the damage caused), exceeds the cost of addressing the leaks.
- We support compulsory metering, however, the issue should be broken into two components: (i) the installation of meters to capture timely information on households' water demand, and (ii) whether households' water bills should be exposed to a unit price of water. i) does not necessarily imply ii), as non-price behavioural interventions to curb water demand still require information from water meters.
- When considering water affordability and vulnerable consumers, the Liberal Democrats should consider whether unelected regulators are best placed to delivering distributional objectives. Progressive tax systems and income transfers are likely a better way to fund affordability support mechanisms. The water sector's legitimate role is in providing data about those struggling to pay their bills, and facilitating water specific interventions, where appropriate, because of their contact with customers and technological knowledge.
- On whether domestic consumers should be able to choose their supplier, we interpret this to mean the creation a water retail market for domestic consumers. While, in general, we believes in the benefits of competition for consumers, CCP research raises questions about whether retail competition in water is likely to prove effective. We have significant concerns about limited consumer engagement, due to the small size of probable savings between suppliers, leading to similar issues as observed in the retail energy market around disengaged consumers. If retail competition is to be introduced, a detailed response to this issue needs to be put in place.

Response to Liberal Democrat Utilities Policy Working Group – Call for Evidence, Theme: Water Industry Regulation

The Centre for Competition Policy welcomes the opportunity to provide evidence on water regulation to the Liberal Democrat’s Utilities Policy Working Group. Before responding to specific questions, we outline some general points.

First, it seems important for the Liberal Democrats to determine which objectives it views as the most critical to achieve. This includes considering which issues are short-term matters and which will be most important over the long-term. This is due to the second important observation that there are inevitable trade-offs between different policy objectives.

For example, it is likely that increased investment to address environmental concerns will result in costs that, without additional measures, will be in conflict with affordability. Also, it is not entirely clear that a consumer can be simultaneously protected and empowered; for example, a protected consumer may have less incentive to engage. Also, while public ownership should allow lower cost financing of water infrastructure, the nature of public ownership can introduce pressures that mean, compared to private ownership with independent regulation, less investment in infrastructure occurs. This returns to the problem of trade-offs.

Below we respond to specific questions where we have evidence to provide. The questions in the call to evidence appear to combine disparate issues, hence, we sometimes only respond to parts of the questions.

Responses to Specific Questions

- 1. Should Ofwat’s statutory objectives and priorities be changed? Should Ofwat be given duties to promote the achievement of Liberal Democrats targets for reducing UK greenhouse gas emissions by 75 per cent by 2030 and to net zero by 2045 at the latest?**

See our response to the equivalent question for the Energy Regulation call for evidence. The main point is that simply adding an additional duty to the existing list of duties is unlikely to be a helpful development. If addressing climate change is seen as an overriding objective, it would be better to reassess and rationalise the list of regulator duties.

The diagram below shows how the water regulators’ statutory duties have increased in number and complexity over time. This diagram is part of a technical annex produced by CCP for the National Infrastructure Commission.¹

As Figure 1. “*Diagram on the Evolution of Ofwat Statutory Duties*” highlights, Ofwat has found itself over time balancing an expanding number of **primary, secondary and alternative** duties since it was formed. The figure shows how statutory duties have increased in scope and complexity as a result of UK and EU legislation. The Water Act 1989, having established the mechanism for privatisation, set the statutory duties of the Director General of Water Services

¹ See National Infrastructure Commission, ‘Technical annex: Duties diagrams for water, energy and telecoms – Centre for Competition Policy’, Regulation Study, available at: <https://www.nic.org.uk/publications/technical-annex-duties-diagrams-for-water-energy-and-telecoms-centre-for-competition-policy/>. The diagram was produced by Natalya Mosunova in collaboration with Michael Harker.

as the economic regulator of the water industry. The regulatory framework of the water industry has been modified by several subsequent acts, including the Water Industry act 1991, Water Act 2003 and Water Act 2014. For instance, alongside 11 already-existing primary and secondary duties, the Water Act 2014, added a new primary duty to secure resilience of the sector, defined here as securing the long-term resilience of water supply and sewerage systems and referring to environmental pressures, population growth and changes in consumer behaviour². Again, we underscore how adding more duties would add to an already-burgeoning set of objectives.

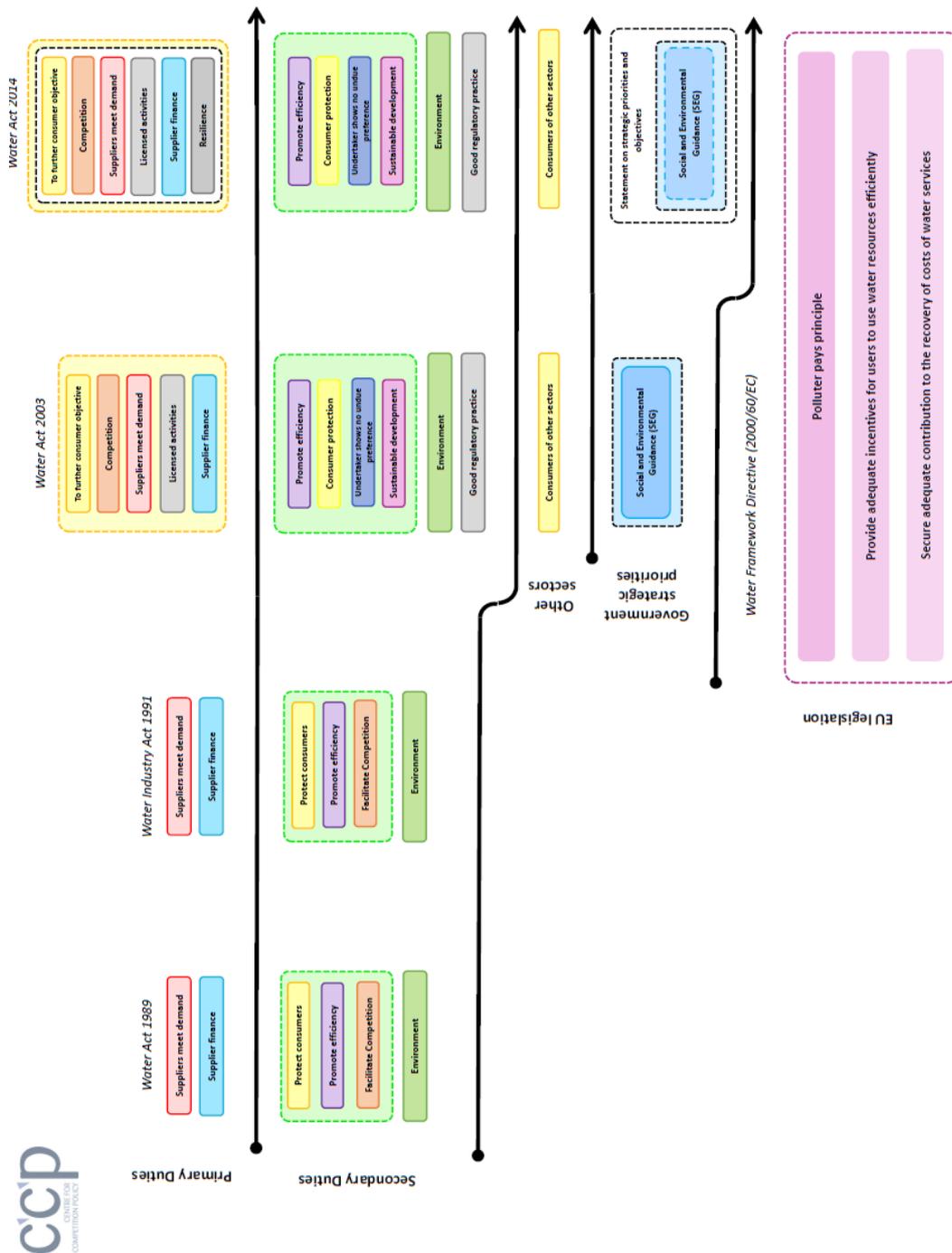


Diagram of the water regulators' statutory duties over time

2. Should Liberal Democrats develop new forms of ownership model in the water industry, to give consumers a better deal and/or address the climate and environment emergency with greater urgency? Which models, and how might these be developed?

This is something worth investigating, especially considering that the property rights for water in the UK are (relatively) vague. Although, before any assessment on the suitability of the structure of the water industry is made, it is first necessary to prioritise the objectives that the Liberal Democrats wish the water sector to achieve. Ennis and Deller (2019) highlight that the issues are complex with the incentives created by the regulatory regime arguably being more important than simply the ownership of assets and operators.

Around Europe, there is a variety of ownership models for water infrastructure and water service operators. Public ownership of assets does not necessarily imply the public operation of water services nor the public funding of these services from general taxation. The review of the international evidence by Ennis and Deller (both from Europe and further afield) on the impact of private sector involvement on water operator efficiency reveals a mixed set of results regarding whether efficiency is increased or not. This mixed overall picture is likely explained by the role of local geography/climate and the importance of the nature of regulation governing operator behaviour. Also, assessing the performance of alternative ownership structures can be challenging because changes in ownership are often associated with changes in the prioritisation of different objectives for the water sector. Trade-offs between different policy objectives are unlikely to be fundamentally altered by changes in ownership.

Perhaps the key economic feature of the water sector is its reliance on a long-lived fixed infrastructure that is too costly to duplicate, implying that parts of the water supply chain are a natural monopoly, with limited potential scope for direct competition. The condition of this infrastructure is fundamental in determining the ability of the water system to deliver on society's objectives and a central question is how to ensure an optimal quantity of infrastructure investment occurs. Ennis and Deller (2019) note that while public ownership of the water sector will generally lower the cost of borrowing to fund investment, a system of independent regulation and private ownership may offer a commitment to a larger quantity of sustained investment. At times, government decision-makers may have an incentive to delay required investments to keep water bills low in the short-term and/or to limit the extent of public sector borrowing. A key insight is that regardless of ownership structure the ability of independent regulators to provide oversight of, and a commitment to, sustained infrastructure investment is likely to be important.

A major difference between water and other utility sectors is that the appointed water companies in England and Wales are regional monopolies and household water consumers cannot change their water suppliers. As a result, the inherent incentive for companies to innovate and compete over customers is absent in the sector. This partly explains the high-risk aversion of water companies towards innovation, as noted by Ofwat.

Nevertheless the model of privately owned water companies in the UK has been associated with significant investment since privatisation. £126 billion was invested between 1987 and 2015 on building and maintaining water services, and a further £44 billion of investment was expected to be spent between April 2015 and March 2020, including on increasing resilience and protecting the environment (National Audit Office 2015). This has led to a degree of technical change which some studies suggest has improved efficiency within the industry.³

³ See Saal et al. (2007)

The impact of such investment in improving outcomes for consumers depends on whether funds were spent efficiently. While investment increased after privatisation, there has been a reduction in centralised R&D spending.⁴

Innovation also requires a supportive culture among different parties in the sector. Plausibly, because they are regional monopolies, water companies may consider themselves as self-contained and thus do not fully explore the possibility that benefits of innovations would provide value to water consumers beyond their own geographic areas. Without the right incentives or a clear mechanism/framework to share information effectively, this could be problematic.

Potential co-operation between firms around innovation will be heavily influenced by the regulatory regime. Ofwat uses comparative benchmarking to assess the performance of water companies. While this does not necessarily render collaborative innovation impossible, it does raise questions about the incentives to share innovations. For example, collaborations on methods to address water leakage may face challenges as Ofwat ranks companies in terms of water leakage efficiency (amongst other things), potentially reducing the willingness to share innovations that might help a firms' competitors improve their rank.

Collaborations between companies that are competitors are relatively rare, but can generate significant benefits. For example, Bowen et al.⁵ examine Canada's Oil Sands Innovation Alliance (COSIA) established in 2012 between twelve major competing companies in the Alberta oil sands. COSIA was an initiative to share intellectual property and collaborate on developing new technology to improve the industry's environmental performance, such as priorities on tailings, water and greenhouse gases.

COSIA members developed a set of formal agreements. Specifically, they agreed to: (i) allow firms to choose the projects they contribute to, knowing that all project outcomes will be shared with all members; and (ii) ensure that any technology shared within the initiative would not be applied elsewhere (e.g. other countries or regions);

Establishing the organising rules used to govern shared activities took considerable time to negotiate and evolved considerably over the course of negotiations. In particular, Bowen et al. (2018) found that companies took a shorter period of time to negotiate, and generated more innovation projects, when the issue was relatively smallscale and of local relevance. For example, regarding greenhouse gases, COSIA failed to make technology/intellectual property shareable beyond the project team, as companies did not wish to share technology that was central to their competitive advantage outside of the Alberto region.

In 2019 Ofwat consulted on proposal to set up a single independent expert entity and a joint framework underpinning funding criteria and ways to share information among water companies.⁶

3. How can resilience to drought be addressed? In particular:

(a) What changes, if any, are needed to the regulatory framework and the relationships between government, Ofwat and the Environment Agency?

⁴ See Amodu et al. (2019)

⁵ See Bowen et al. (2018)

⁶ See Ofwat, 'Consultation on Driving Transformational Innovation in the Sector', September 2019, available at: <https://www.ofwat.gov.uk/consultation/ofwats-emerging-strategy-driving-transformational-innovation-in-the-sector/#Consultation>

(b) How should the water abstraction licensing and management system be improved?

(c) What new measures are needed to manage demand and reduce leakage?

Managing Water Demand

While generally supporting efforts to manage demand, we note it is important use robust evidence to demonstrate that: (a) that proposed interventions can reduce aggregate water demand on the necessary scale, and that (b) demand management options represent a lower cost/more desirable solution to consumers than increasing supply. A necessary pre-condition for most effective demand management is the roll out of meters of sufficient sophistication. The roll out of meters is an infrastructure cost and both price and non-price demand management are likely to involve increased administrative costs compared to the status quo.⁷

Whenever new measures are considered it is essential there are proper cost-benefit analyses before implementation. It is increasingly pertinent to gather robust evidence not only on water efficiency projects at the aggregate level, but also the relative effectiveness of individual measures used such as retrofit programmes and behavioural trials. It is important to first deploy those interventions with the greatest benefits relative to costs. Currently, there is little evidence on the cost-effectiveness of information-based interventions on water conservation in the UK, as noted by Defra in its 2018 Rapid Evidence Assessment.⁸

The following discussion is based on a review of the literature (Lu et al., 2019) on the effectiveness of increasing block tariffs (IBTs) and behavioural interventions to constrain water demand. The simplest way to manage water demand would be to have a unit price for water. In the UK, the current absence of compulsory water metering is an obvious barrier at present to all households facing a price for water. Also, the introduction of unit water pricing for households has tended to be politically challenging due to concerns about ensuring low income households can still afford the water required for essential activities. In an attempt to balance the potential conservation powers of water pricing with distributional concerns many areas have adopted IBTs.

Lu (2019) highlights the key barriers to conducting effective information-based behavioural interventions in the UK water sector. The ability of water companies to use monetary incentives or behavioural interventions to conserve water is difficult (impossible) when firms collect water consumption information at infrequent intervals/entirely absent for unmetered households. Timely and easily accessible water consumption information is essential if households are to respond to incentives. Householders are unlikely to adjust their behaviour for financial reasons unless they can see that their efforts to conserve water lead to reduced bills.

Collating frequent consumption data is also required if non-financial incentives, such as social comparison, are to be used. Of course, increasing the frequency of collecting consumption information from, and communicating information to, households should be weighed against the cost of doing so. Efforts to increase water conservation will likely require increased communications with households and, hence, additional costs.

⁷ For example, more frequent billing may be required.

⁸ See Defra (2018), 'Water Efficiency and Behaviour Change Rapid Evidence Assessment (REA) – Final Report', April 2018, available at: <https://waterwise.org.uk/knowledge-base/water-efficiency-and-behaviour-change-rapid-evidence-assessment-2018/>

One of the major issues here is that water is a relatively 'invisible good' that accounts for a small fraction of consumer expenditures. UK water consumers generally lack knowledge on the detail of their own water consumption and tariffs. As summarised in Lu et al. (2019), low engagement may be due to: (i) the UK having a temperate climate and not currently perceived as having serious water scarcity; (ii) water bills being typically small relative to household income and thus attracting little attention; and (iii) many households have an unmetered water supply.

For these reasons that pure financial incentives may prove problematic, and behavioural interventions through a better supply of information and interactivity for consumers could be fruitful. A growing trend in behavioural economics has been to illustrate how human psychology can inform useful tools to facilitate change. Examples include providing simple information and appealing to our preoccupation with social comparisons (Alcott, 2011; Brock, 2015, Brock and Borzino, forthcoming).

Regarding water conservation, evidence from a large-scale behavioural intervention in the US (Ferraro and Price, 2013) suggests that offering socially comparative feedback to households could reduce water consumption by an amount equivalent to a 12%-15% increase in average price. However, Lu et al. (2019) show that the effectiveness of behavioural interventions depends heavily on their design. There is also a lack of evidence on the persistence of the effects of interventions over the long-term. In energy, the evidence is incredibly mixed and highly dependent on the sample and treatments employed (Abrahamse et al, 2005; Allcott & Rogers, 2014; Dolan & Metcalfe, 2015).

An exception to this general lack of evidence, as summarised in Lu et al. (2019), in Zaragoza, the combination of IBTs and a reward scheme managed to achieve a 27% reduction in overall water consumption between 1996 and 2008. Under the reward scheme, households who reduced water usage by at least 40% in the first year of joining the scheme 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.

A mechanism for interventions to lower water demand is by encouraging investment by households in more water-efficient appliances. However, it is necessary to remember that purchases of large appliances, e.g. washing machines, are relatively infrequent. As such it may take a long time for a large number of households to be operating water-efficient appliances. As a starting assumption, one might expect wealthier households to replace appliances on a more frequent basis.

While a variety of behavioural interventions have been trialled in the UK, a surprisingly small number of projects sought to quantify the contribution of information provision/communication to achieving water savings. For the very few projects that aimed to capture these effects, weak experimental designs and the practical obstacle of a lack of metering prevented robust evaluations (see Lu, 2019). Robust randomised control trials of behavioural interventions that assess their cost-effectiveness appear a priority to inform effective policymaking. Evidence is still required around the conservation effects of different information types; the persistence of these effects are; how the effects vary across households with different water consumption levels and socioeconomic characteristics; and how outcomes vary according to the organisation providing/endorsing the information and the communication channel used.

There also appears to be little evidence on how different demand management interventions may interact. The policymaking objective must be to find the optimal combination of demand management measures. To gain the necessary evidence any organisation planning multiple demand management interventions needs to think carefully about phasing the introduction of

interventions so the effectiveness of individual interventions can be isolated alongside any complementarities/conflicts. The existing evidence reviewed by Lu et al (2019) on price and behavioural interventions suggests a possible complementarity between these two approaches: while the effect of information-based interventions diminishes over time, conservation-oriented pricing structures can become more effective over time. Thus combining the two types of interventions may support both immediate and sustained water conservation effects.

Water consumers, at least household consumers, tend to hold specific beliefs about water that can affect their attitudes and decision-making regarding consumption. Lu et al (2018) note a significant issue with the existing academic evidence is it relates to interventions in regions where droughts are common and the public awareness of water resource challenges is high. A survey of 1200 households in the UK suggests individuals who perceived environmental issues as a genuine threat to their own welfare were likely to save resources.⁹ This implies drought events can change households' perception of water and water consumption. Those who have experienced droughts are likely to have a deeper understanding of the importance of conservation and thus be more willing to engage in water-saving activities.

Reducing Leakage

Before considering the options for reducing leakage, there is a need to consider the cost of the water lost through leaks. Leaks should only be addressed when the value of the water lost (or the damage caused), exceeds the cost of addressing the leaks. One presumes that leaking water will feed back into the water cycle and so might not be truly lost, i.e. it may seep back into an aquifer. In this instance, one might think the real cost of the leak is primarily the cost of treating and transporting the water that leaks. As such, one may question the level of attention given to reducing leaks in popular debates.

In terms of data on leaks. Leakage has decreased by 38% from 1990 levels, when water lost peaked at over 5,112 million litres per day¹⁰. However, improvements have levelled off recently with leakage reducing by 6% over the 7 years between 2010-11 and 2017-18 (over this period water lost fell from 3,381 million litres a day¹¹ to 3,183 million litres per day¹². Ofwat has challenged companies to improve their leakage levels, and they have promised investment to reduce levels by an additional 15% over the next five years.

(d) Should government use regulations allow all water companies to implement compulsory metering, using smart meters? How should economically vulnerable customers be protected against any significant increases in water bills?

The issue of compulsory metering should be broken into two components: (i) the installation of meters to capture timely information on individual households' water demand, and (ii) whether households' water bills should be linked to consumption, i.e. whether households are exposed to a unit price of water. As discussed above, (i) does not automatically imply (ii), as non-price behavioural interventions to curb water demand still require the consumption information from household water meters, although, one would expect the potential to create price signals to conserve water to be a key benefit of metering.

⁹ Gilg and Barr (2006)

¹⁰ See Ofwat (2016a)

¹¹ Water UK (2014), 'How water companies measure leakage', available at: <https://www.water.org.uk/news-item/howwater-companies-measure-leakage/>

¹² Discover Water, Leaking pipes, <https://discoverwater.co.uk/leaking-pipes>

We support metering being compulsory, so that we know what the demand of individual households really is, we can send signals to consumers and we have a better means of detecting leaks. However, the desirability to charge consumers on the basis of their consumption potentially depends on the relative importance given to water conservation relative to distributional objectives.

Price signals, water conservation and water affordability

The key question is whether prices should be used to curb water demand. In theory, the price mechanism seems to be an effective means to constrain the use of water, but relying on water pricing may have a negative effect on poorer households given that society wishes households to always afford water for essential purposes (drinking, cooking and sanitation).

There are charging options that could strike a balance between affordability and conservation objectives. For example, Increasing Block Tariffs (IBTs) are a pricing structure under which the per-unit price varies with consumption so that prices are low for 'essential' consumption and high for 'discretionary' consumption. In practice, the success of IBTs in meeting both distributional and conservation objectives depends on their design and consumer response. Lu et al. (2019) review the international evidence on using IBTs to conserve water, highlighting the operational challenges of implementing effective IBTs. For example, it is perhaps doubtful that households can respond in a fully rational way to IBTs given their complexity. Also, setting the usage level deemed 'essential' is difficult without accurate up to date information about household occupancy. Before IBTs could be introduced in the UK a key step would be to develop a substantial body of evidence around individual households' water consumption and expenditure.

At present meters are optional in non-new build properties and so households in Britain can refuse to have a meter fitted, thereby avoiding unit water pricing. When considering the impact of metering, a reasonable starting presumption is that usage will be higher if the consumer is not subject to a unit water price as there is no financial incentive for a consumer to constrain their consumption. Hence, these high consumption households are likely to be the ones where the greatest potential water savings are located. However, analysis needs to be performed to confirm that the choice not to be metered is a rational response, i.e. those who chose not to be metered are those that would see an increase in their water bill if a meter were installed. If those currently without a meter are predominantly those who would see their water bill increase under a system of compulsory metering, one should be prepared for potentially vocal opposition to universal charging by metered volume.

If water bills increase as a result of water charging, this will in some cases create hardship while at the same time increasing the revenue received by water companies. It is worth considering whether there are specific traits of certain un-metered households that could indicate that they are at particular risk of hardship should their water bill increase. It seems reasonable to earmark some of the additional revenue for a hardship fund to deal with any adverse effect on vulnerable or poor consumers. However, there is the question who should decide on the size and nature of hardship support. In the first instance, it seems reasonable for elected democratic representatives to determine the appropriate level of support rather than individual firms or an unelected regulator.

Other metering issues

One possible issue is the placement of the meter. There is evidence to suggest that, even those with a pre-stated desire to act, might not be able to do so without information on their usage or how they can adapt this (Brock, 2015, Brock and Borzino forthcoming) If metering is to have an impact on the household's consumption, the meter (or a separate device reporting

key water consumption information) must be placed where the householder can easily see the information it provides. Households who are exposed to more consumption information are expected to have a better understanding of the relationship between their water use habits, water consumption and water expenditure (Lu et al., 2019). Even with 'accessible' water consumption information, many households may choose, rationally or otherwise, not to engage with it.

Another aspect to consider is whether there are additional conservation gains from combining the installation of a meter with the immediate start of behavioural interventions. One might suspect consumers may pay particular attention to water-related messages and water usage soon after a meter installation.

5. Does the price control process need reform, in order to give consumers a better deal, improve resilience and improve environmental outcomes?

We provide two limited observations around the price control process. The first is the scale of the process with large resulting costs for both suppliers and the regulator. This complexity also potentially increases the opacity of the process. Thought might be given to whether the process can be simplified to focus on the effective delivery of a limited set of core objectives. Piecemeal adaptation of the existing arrangements may not be the optimal solution.

Second, the current arrangements rely heavily on companies' engagement with Consumer Challenge Groups. We support the rigorous challenge of companies' plans by the consumers who have to pay for them. However, we wonder if there is a case for Ofwat itself to conduct a greater amount of research into consumers' preferences and willingness to pay for services? Ofwat having greater direct knowledge of consumers' desires may enable them to more effectively interrogate water companies' proposals. Ofwat conducting this type of activity would also address any lingering concerns about companies' abilities to influence Consumer Challenge Groups' deliberations by indirect means.

7. What combination of regulation (Ofwat action) and Government spending policies (funded from taxation) should be used to assist ensure that low-income and vulnerable customers can receive support? Or does the way financial assistance is provided to address water affordability need a more fundamental rethink?

See our response to the equivalent question for fuel poverty in your call for evidence on energy regulation. If water conservation is a primary objective, the easiest way to achieve this is with a high unit price for water. If there are concerns about particular groups of householders being unable to afford these prices, the best way to deal with this, and one which preserves water conservation incentives, is to provide these householders with increased resources (i.e. income transfers).

A key question is why water affordability should be considered distinct from general poverty? Why is a water specific intervention appropriate rather than an intervention that raises a household's income?

When delivering distributional objectives, one question is how to allocate responsibility for: (i) identifying those judged deserving of support, (ii) raising funding for activities meeting distributional objectives and, (iii) facilitating interventions. Distributional concerns involve explicit value judgements and it is appropriate for these judgements to be taken by democratically elected governments, while the progressive tax system seems a better way to fund water affordability support than a flat charge on all water bills. Where the water industry may have a legitimate role to play is in providing data on those struggling to pay their bills and

in facilitating water specific interventions (if these are demonstrated to be useful) due to their contact with customers and technological knowledge.

8. What more should Ofwat do to ensure that the water retail market reaches its full potential? Should domestic customers be able to choose their own water supplier?

Here we focus on the second part of the question concerning choice for domestic consumers and interpret this to mean the creation a water retail market for domestic consumers.

CCP has a long record of demonstrating the general and significant benefits that can be attributed to competition within markets. A good summary of this material is provided by Davies et al. (2004). Davies et al. provide a series of UK case studies to highlight the benefits that can be attributed to competition. The case studies that Davies et al consider are: retail opticians' services, international telephone calls, the Net Book Agreement, passenger flights in Europe, new cars and replica football kits.

However, a casual review of the economics literature on water provision does not reveal a great interest in considering the implications of household retail competition. Instead, the emphasis of the literature suggests that the greatest efficiency gains from introducing 'markets' relate to (i) the trading of limited water resources at the wholesale level¹³, and (ii) introducing a price signal through water metering and unit charging to reduce consumption.

Core elements of the water industry that are likely to have a strong influence on the desirability and optimal structure of retail water markets for households include:

- (i) Compulsory roll-out of water meters to all household consumers
- (ii) Whether water provision and wastewater disposal are a single or separate product(s)/market(s)
- (iii) Additional/stronger vertical separation of the water supply chain
- (iv) Creation of a single 'national grid' for the water network
- (v) Franchising vertically integrated and geographically separate water supply areas¹⁴

These parameters vary significantly in their radicalness and plausibility of implementation; when assessing the attractiveness of retail competition for householders it useful to consider how benefits change if other changes to the industry are introduced simultaneously. If these 'higher level' options are not considered and evaluated, there is the potential that the piecemeal introduction of competition into different aspects of the water sector may not lead to a 'first best' industrial/market structure. Similarly, understanding different industrial structures and their merits/weaknesses may help to identify risks and opportunities associated with introducing household retail competition within the confines of the current industry structure. Equally, it should be remembered that if changes (i)-(v) are considered beneficial, it may be possible to introduce them without introducing retail competition.

Of the elements laid out above, (i) and (ii) seem the most pressing to address. We expect it is preferable for water and wastewater to be treated as a single product. This for two reasons: firstly, we would expect significant economies and coordination benefits from combined provision and, secondly, two separate markets would significantly increase the complexity and costs of engagement for consumers.

¹³ See Foellmi and Meister (2012) for references to the academic literature on water trading.

¹⁴ Foellmi and Meister (2012) note that in France franchising is prevalent with competition occurring 'for the market' rather than 'in the market'. They also note that the German Monopoly Commission recommended the application of franchise bidding to improve the efficiency of water supply.

A basic element of consumer choice in markets for products with a non-trivial marginal cost of supply, whether regulated or unregulated, is that there is a cost associated with increased consumption for consumers. To introduce retail competition in water for all households in the absence of compulsory metering would imply a version of competition in the UK water sector that would be 'exceptional', although, the Cave review¹⁵ notes that the absence of metering does not preclude retail competition. The operation of the current 'optional' metering system in the UK is already described as "unusual" by Waddams and Clayton (2010)¹⁶ and has specific efficiency and distributional implications.

If retail competition in the water sector is to be pursued, an evidence-based approach to policy making would suggest potential lessons from other sectors, such as energy, should be studied closely.

Timing the introduction of retail competition: An interesting question is whether introducing water retail competition for households is optimal in light of projected future water prices. This to: (i) the likely politics of a newly liberalised market, and (ii) the establishment of consumer norms regarding whether or not it is worth engaging with the retail water market. From purely a political perspective, and the promotion of markets as a 'good thing', it seems easier to introduce competition when price projections predict a period of falling prices.

The more substantive benefit of introducing competition when prices are falling is that when consumers first engage with the market they will be routinely encountering improved offers involving savings (compared to the previous year's bill) and so will feel motivated to take part in the market. If competition was introduced in a period of rising prices, while there may be relative savings between suppliers, the quotes based on consumers' previous consumption are likely to show expenditure increases compared to their previous year's bill. Consumer engagement may be lower in this latter environment as consumers may feel less satisfied with the offers they are receiving. Similarly, there is the risk that political arguments, rightly or wrongly, suggesting that the removal of regulation has caused the price increases.

The authors' understanding is that over the long term the costs of obtaining clean water are likely to rise, possibly considerably. If one believed that consumers were behavioural rather than fully rational, so that they were conditioned by their initial experiences of a new market, one might be concerned about introducing retail competition in a low cost environment prior to a shift to a high cost environment. The concern would be that behavioural consumers would be conditioned in the low cost environment into believing that the savings available in the water market are small and permanently disengage from the water market.

The Potential for Consumer Gains

In terms of potential gains to consumers from greater competition they could involve lower prices due to efficiency gains, improved customer service and/or increased innovation. However, it is not certain that these gains will result. Below the discussion focuses on the potential for efficiency gains. Also, while we believe that total welfare will probably increase as a result of competition, the likely impact on consumer welfare is harder to predict.

Even if the water sector overall is considered inefficient, it is not automatic that introducing retail competition will drive significant efficiency gains. The potential for efficiency gains lies at two levels: (i) in the delivery of retail services themselves, or (ii) further upstream. There are

¹⁵ See paragraph 5.15 on pg 79 where it states: "The analysis highlights that retail competition can be introduced whilst maintaining tariffs differentiated by rateable value and geographic averaging."

¹⁶ See the fourth paragraph on pg11 of Waddams and Clayton (2010).

then two further key questions to consider: (a) will savings from efficiency gains be passed on to consumers, and (b) will potential price differentials between water retailers be sufficient to motivate active engagement by water consumers? If the answers to these two questions is negative, introducing retail competition for households is likely to face challenges and may not prove popular with consumers.

While not necessarily endorsing on the quality of the methodology, in 2016 Ofwat¹⁷ provided figures suggesting potential welfare gain from competition in net present value (NPV) terms ranged from +£2.9bn in the most optimistic scenario to -£1.4bn in the most negative scenario.¹⁸ The most optimistic scenario would be equivalent to average reduction in bills to consumers of around £8 per annum over 30 years. Also, Ofwat reported consumers' response to these small potential savings in the CC Water market research was not particularly enthusiastic.¹⁹ While the savings appear relatively small on per customer per annum basis, Ofwat notes that the most optimistic scenario for the household sector has an NPV much higher than that estimated in the impact assessment for water retail competition for businesses which was put at £211m in 2009 prices.²⁰ The range of estimates for the NPV of water retail competition for households reflects the inherent uncertainties in assessing the impact of retail competition. Table 3 in Ofwat (2016b) provides details of the assumptions employed to provide the different NPV estimates.

When thinking about the upstream efficiency gains that retail competition might induce a critical question is to understand the proportion of the upstream cost base that will plausibly be open to commercial pricing pressure. If a large proportion of costs in the water sector is attributable to its transportation, then retail competition is unlikely to drive significant efficiency gains since the water network itself is a natural monopoly and is likely to remain heavily regulated. Taking a step upwards from the water transport network is what one might term 'clean water production', i.e. the extraction, storage and treatment of water. Again it seems likely that many of the costs of clean water production are fixed exogenously by decisions taken by environmental and health regulators regarding water quality.

Also, for pricing pressure in the retail household water market to drive efficiency in clean water production there needs to be a choice of clean water suppliers for the retail water suppliers. At present, this choice, at least with respect to water treatment and storage facilities, appears to be lacking as treatment and storage facilities are vertically integrated with the transportation network. While entry might be possible, one might question the probability of this occurring (due to the regional structure of water supply networks), and the desirability of this fragmentation, if externalities exist and property rights are unclear. Also, the current regional

¹⁷ See Ofwat (2016b).

¹⁸ £856m of the difference between scenarios is accounted for by differences in how bad debts are treated. Not only may one question whether competition will (and is the only way) to reduce bad debt, there are likely to be significant distributional consequences from bad debt reduction. If the competition alters the flow of bad debt, it is possible that the reduction bad debt results in a positive process for indebted consumers with water firms helping with budgeting issues. If competition is expected to reduce the existing stock of bad debt, it is difficult to see how this can avoid tougher enforcement action to recover bad debt. Tougher debt recovery measures may well have political salience.

¹⁹ "The CC Water research identified that whilst the majority of customers supported the principle of a competitive water market, potential bill savings of £4-£8... were far below what most customers expected", paragraph 2, page 13, Ofwat (2016c).

²⁰ See page 13, Ofwat (2016b)

separation of water supply networks and existence of regional water supply companies seem to be ideal conditions to enable tacit collusion in the clean water production sector.²¹

A point made by Waddams and Clayton (2010) is that, if there is retail competition for large water users, but the household water market remains regulated, there is an incentive for water suppliers to shift costs towards the regulated household sector thereby raising household water prices. While this may be true, it is not automatic that the introducing retail competition into the household water sector would resolve this problem. Firms with full freedom to set prices tend to price discriminate between consumers with substantially different price elasticities of demand. As we discuss below, it is likely that many (most) household consumers will be 'sticky' and, hence, one might expect to see household consumers being charged relatively higher prices than commercial users.

The Likelihood of Retail Competition Generating Pricing Pressure

The transfer of efficiency savings to reductions in bills is not automatic in plausible competitive processes (unlike under explicit price regulation). Instead the pass through of efficiencies is complex and probably uneven across consumer groups; hence, the impact of competition on total welfare may be different from that on consumer welfare.

Competition is an ongoing process rather than a static outcome and for it to work effectively consumers must have a reason to take the time and effort to engage with the market. Our scepticism towards households, taken as a whole, exerting substantial pricing pressure on water supply firms is based on a substantial body of empirical evidence from CCP's research programme. It seems probable that a retail household water market would separate into: a small highly competitive market for those consumers willing to switch regularly and a much larger 'stagnant' market for the majority of households who do not engage with the market.²² There are particular reasons why we think competition in the household water market may face greater challenges than the current account or domestic energy markets.

If some consumers do not engage and firms price discriminate, there is no guarantee that their water bills will fall for inactive consumers and there is a risk that their bills could rise. Given the high likelihood of non-engagement by many consumers, the issues discussed in our accompanying response to the Liberal Democrats' call for evidence regarding energy regulation, especially around alternatives to the energy price cap become relevant. Aside from 'backstop' price regulation for inactive consumers, one possibility for effective price competition in water would be a centralised auction process where water retailers bid to supply blocks of consumers in a process similar to an opt-out collective switching scheme. Here competition would be 'for the market' rather than 'in the market'.

CCP has conducted considerable research using surveys and commercial data to understand consumer behaviour in regulated markets. The core results from this research can be summarised as the following:

1. The size of monetary savings is consistently a core driver of consumer switching, although, the presence of substantial monetary savings does not guarantee consumers will switch
2. The level of switching varies systematically across different types of consumers

²¹ Note that a key driver of early competition in the liberalised retail energy market was the presence of a national competitor, British Gas, who had an incentive to challenge all regional incumbents within their home regions through competitively priced 'dual fuel' deals.

²² This was the essence of the CMA's concerns regarding the effectiveness of consumer response and competition in the UK energy market. See CMA (2016).

3. Consumers may make 'mistakes' regarding the tariff they choose so they pay more than they have to, although, through learning, these mistakes tend to diminish through time.

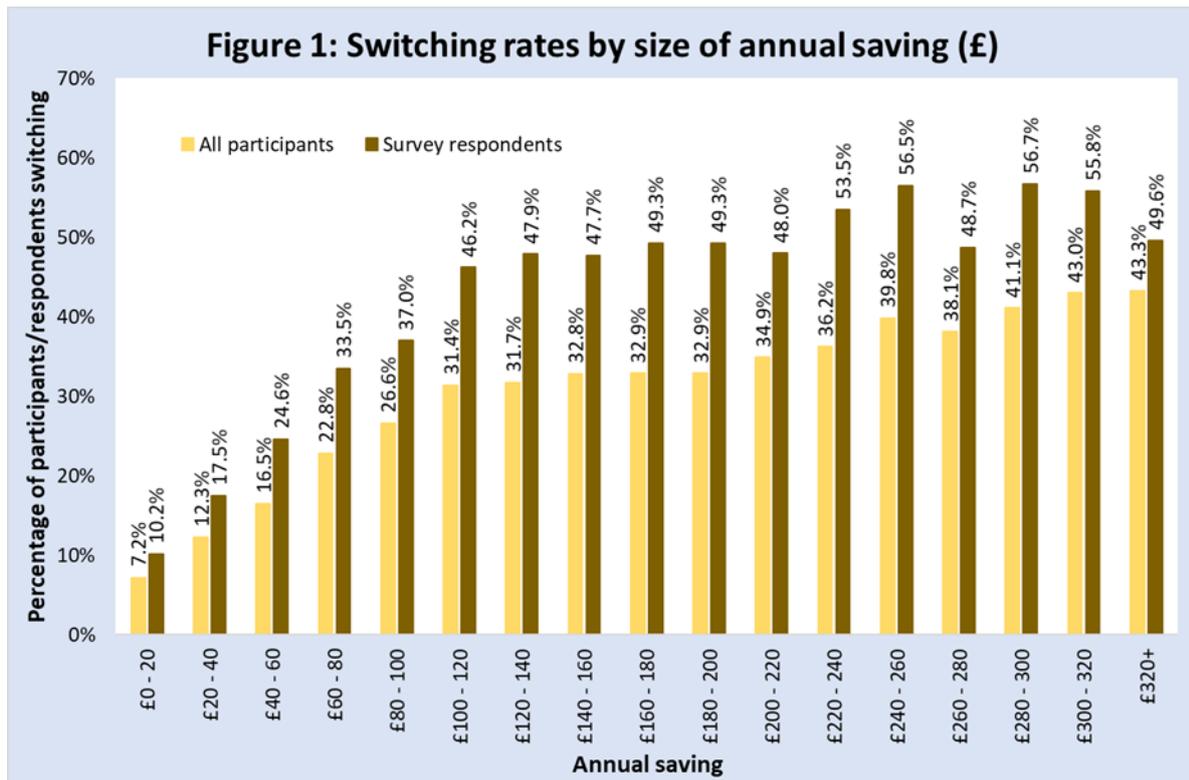
Monetary Savings and Switching Behaviour: The importance of monetary savings as a central drive of consumer switching is demonstrated by: Waddams Price and Zhu (2016a), Deller et al. (forthcoming), Flores and Waddams Price (2018) and Giulietti, Waddams Price and Waterson (2005). Point 1 is the main reason why the authors question the likely effectiveness of retail water competition for households.

What might be the possible magnitude of price differentials in the water sector to stimulate switching? The average water bill is around £400²³. Assuming that incumbent and entrant retailers have similar efficiency, price differences between retailers will depend on differences in the profit margins they charge. Consider a scenario that likely accentuates the difference between incumbents and entrants: suppose incumbents achieve a profit margin of 10%²⁴ due to 'sticky' consumers, while an entrant initially acts aggressively to grow and accepts a 0% profit margin. In this plausible 'upper bound' scenario, the direct financial saving to an average household from switching is £40 per annum. £40 is substantially smaller than the savings observed in either the banking or energy markets, markets which are often commonly labelled as having 'worryingly low switching rates'.

That large monetary savings by themselves are insufficient to guarantee switching is clearly illustrated by Deller et al (forthcoming) who studied a collective switching event in the UK energy market entitled 'The Big Switch' (TBS). Even when consumers were offered annual savings of more than £300 (see Figure below), only around half of consumers actually switched. These results are particularly striking given consumers receiving an offer in TBS had already expended some effort to provide their full energy details, and were expecting to receive to an offer which required little further action to accept. As TBS was linked to Which?, the UK consumer association, we also expect that those who took part are likely to be more informed and engaged than an 'average' consumer.

²³ See the article 'Average water and sewerage bills for England and Wales to fall by £17 in 2020/21' by Water UK, available at: <https://www.water.org.uk/news-item/average-water-and-sewerage-bills-for-england-and-wales-to-fall-by-17-in-2020-21/>

²⁴ The argument would not change substantially if the operating margin was 5% or 15%.



For a rational consumer to consider switching, and therefore be a driver of competition, the expected gains²⁵ from switching must exceed the expected costs. The expected costs take three main forms: (i) the opportunity cost of time spent searching for cheaper tariffs and actually completing a switch, (ii) contractual terms, such as exit fees, that impose costs and (iii) uncertainty regarding the quality of the new supplier.²⁶ That engaging with a market imposes costs on consumers is key point that needs to be considered when evaluating different options for structuring the retail water market; two benefits of regulated prices or an ‘opt out’ collective switching system are that consumers do not incur the opportunity cost of engagement and the chosen mechanism does not rely on consumer engagement to be effective.

Differences Across Consumers That different consumers respond in different ways to particular monetary savings is emphasised in Waddams Price and Zhu (2016a) and Flores and Waddams Price (2018). After controlling for a full range of factors, Waddams Price and Zhu find a U-shaped relationship between age and propensity to switch, with the middle aged being least active. They also show that those on lower incomes are more likely to switch than those on higher incomes after controlling for other factors²⁷, although, those on low incomes

²⁵ Uncertainty about the likelihood of quoted savings being realised means that a consumer is substantially less likely to respond to a quoted saving of £40 than to a decision that is guaranteed to provide immediately £40 in cash.

²⁶ Deller et al (forthcoming) empirically confirm that a wide range of non-price factors influence the decision to switch even in the market for a ‘homogenous’ good such as energy. These factors include: confidence in quoted savings, concerns about issues with the switching process, preferences regarding firms’ ethical and environmental behaviour, time pressures at the point of making the switching decision and the demographic/socio-economic characteristics of households.

²⁷ That particular groups receive lower expected savings on average is one potential reason for why groups often perceived as ‘vulnerable’ are often observed as having raw switching

are not significantly more likely to search. Also, those on lower incomes were found to be less responsive to monetary gains, but more sensitive to the time spent on the process than higher income households. Similarly, those from lower educational backgrounds were found to be more responsive to expected monetary gains, and the time taken to switch was a greater deterrent to searching, than for higher educational groups. These results suggest that the introduction of competition for household water consumers will affect consumers in different, and potentially complex, ways. That different consumers respond to differing extents to the offers that they receive suggest that any potential benefits of water retail competition will be distributed unevenly across households.

Also, the research of Waddams Price and Zhu (2016a) and Flores and Waddams Price (2018) find a positive association between switching in different sectors, i.e. if a consumer switches supplier in one market it is associated with the consumer being more likely to switch in other markets as well.²⁸ This suggests that the consumers who will capture gains by switching in a competitive water market are likely to be those who are already 'active' and have had positive experiences of engaging with other service markets.

Consumer Choice and 'Mistakes' The discussion above, concerning monetary savings, is based on a fully rational model of consumer behaviour. In the past decade increasing attention has been given to behavioural economics and how consumers may not behave in ways that conform to a fully rational model of behaviour.²⁹ A relevant example of these issues is the potential for consumers to make 'mistakes' when making purchasing decisions. If consumers make mistakes, it means that, even if good deals exist in a market, consumers may not be able to identify and secure them. Evidence of consumers consistently making mistakes would reduce the attractiveness of introducing household water competition. However, the evidence on this issue produced by CCP researchers is mixed. Wilson and Waddams Price (2010) report that among those UK energy consumers who switched exclusively for price reasons less than half of the total gains available were actually captured by switching consumers. Even more significantly, at least 17% of consumers reduced their monetary surplus after switching supplier.

In contrast, Ketcham et al (2012), who consider a radical change to US healthcare insurance, emphasise that, while consumers may initially make mistakes leading to overpayments, through learning, these errors are reduced through time. 'Overpaying' in a new environment may result from rational individuals having incorrect expectations regarding future consumption rather than the consumers behaving in a non-rational manner. Similarly, Miravete and Palacios-Huerta (2014) find that when optional metering was introduced into the Kentucky telephone market in 1986 consumers again rapidly corrected initial mistakes regarding a simple tariff choice problem. Miravete and Palacios-Huerta find that households learn at different rates: those households who faced a more challenging choice problem were more likely to make mistakes and took longer to correct them.

rates which are lower than the average in market research reports published by UK sector regulators.

²⁸ Although Flores and Waddams Price show that this effect is not present in all groups of consumers.

²⁹ For an overview of how behavioural economics influences competition and relates to consumer policy see the CCP book, 'Behavioural Economics in Competition and Consumer Policy' available to download at:

<http://competitionpolicy.ac.uk/documents/8158338/8193541/CCP+economics+book+Final+digital+version++colour.pdf/30214557-cace-4b0b-8aac-a801bbde87bc>

Other Factors Affecting Household Switching in Water: Deller, Hviid and Waddams (2015) note that one might expect consumer engagement in regulated service sectors, such as water, to be lower than in other consumer facing product markets, such as supermarket food items, due to the reliance of the choice decision on written, frequently numerical, information. Additionally, delayed consumption, consumption uncertainty and pricing uncertainty mean that consumer purchasing decisions for utility services are closer to the purchase of financial services than purchasing items in a supermarket. Furthermore, many citizens may consider water to have a 'special' status since it is essential to life. Such citizens may simply not consider the commoditisation of water and its treatment as a consumer product to be legitimate. It seems likely, that among those who hold this view, engagement with the market will be lower.

Also, certain types of households may face additional barriers or disincentives to market engagement. For example, the CMA's Energy Market Investigation has identified that those living in rented accommodation may face extra barriers to participation in the energy market. These barriers may include: (i) a limited time period in a particular property (thereby limiting the expected gains from switching); (ii) difficulties identifying where the meter is located in a property; (iii) responsibility for utility bills resting with the landlord (an agency problem); and (iv) multiple tenants sharing joint responsibility for dealing with utility bills (a public good problem).

While the evidence above suggests that a saving of £40 is unlikely to generate substantial switching by water consumers, opening the household water sector to competition may have greater importance if, rather than separate markets for water, energy and telecoms etc., a combined market for 'home services' emerges in the future. Here potential savings from household water competition may be important if, when combined with savings from other markets, the expected gain to a consumer is sufficient to induce a switch between home service providers. However, the role of the water sector in such a scenario should not be overplayed since if water forms a small proportion of the total service cost, and a small proportion of total savings, the increase in switching at the margin which can be attributed to a competitive retail water sector is likely to be small.

However, for bundling to be a benefit of competition, it must be that bundling cannot take place in the current regulated environment. What is stopping an energy or telecoms supplier from establishing contractual relationship with the existing regional monopolists to provide a multi-utility package?³⁰ If there are regulatory restrictions barring this type of relationship, these restrictions be removed independently of residential water competition. Similarly, if significant supply side cost savings from multi-utility bundling exist, why are conglomerates combining energy, telecoms and water subsidiaries not more common (unless regulations specifically forbid this)? The absence of such conglomerates suggests that cost savings are small.

Competition between regional incumbents: The nature of retail competition in water will be strongly influenced by the presence of regional incumbents; the energy market provides a plausible example of competition when regional incumbents are required to enter into regions controlled by other incumbents. The result of this process may be heightened awareness of regional price differences among consumers, which can bring its own challenges for the sector and the regulator. These issues, the potential for firms to set different prices in 'home' and 'non-home' regions and the dangers of non-discrimination clauses are discussed in Waddams and Zhu (2016b) and Hviid and Waddams Price (2012).

³⁰ The contractual relationship could simply cover water being supplied to consumers at existing regulated prices within each region.

When considering the feasibility of residential water competition it is essential to check that the potential value of the market and individual consumers is sufficient to stimulate entry and effective competition. As Ofwat (2016d) correctly highlights, unlike the energy market there is no national player (British Gas) to provide a natural competitor to the regional water incumbents.³¹ Effective competition in the residential water retailing is dependent on incumbents' entering rival regions and/or new entrants.³² To understand firms' entry incentives it is necessary to understand the potential profit of an additional consumer and the costs of acquiring such a consumer.

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³¹ Highlighted box, page18

³² A simple strategy for incumbents to implement (entirely legal) tacit collusion would be not to enter areas outside their home region or (probably more likely) make product offerings in non-home regions that represent little competitive threat.

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