Thames Water: Consultation on Water Resources Management Plan 2019

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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CCP Response to Thames Water's Consultation on Water Resources Management Plan 2019

The authors welcome the opportunity to respond to Thames Water's consultation on its Water Resources Management Plan 2019 (WRMP19). With the core theme of designing WRMP19 being securing a long-term balance between supply and demand thus implying improved drought resilience, Thames Water has proposed a preferred plan that in the short-term (AMP7) focuses on demand management (DM). As DM options typically require consumer engagement, this response comments on customer priorities and preferences as well as the DM options considered. This response has three sections: 1. comments on DM options as the short-term priority, 2. comments on customers' views on water resource and DM options, and 3. specific comments on non-price behavioural interventions that are likely to conserve water.

1. Demand management options as the short-term priority

1.1 Thames Water has set out ambitious targets to make the best use of available water resources and firmly states that "it is only when demand reduction is no longer able to keep pace with the growing deficit that we consider the requirement for new supplies."[1] We believe this strategy is appropriate only after careful consideration of the likely effectiveness (in terms of value for money) of DM options in meeting targets. Robust evidence needs to be gathered to show that: (a) the DM options pursued can reduce aggregate water demand on the necessary scale, and (b) DM options represent a lower cost/more desirable solution to consumers than increasing supply. A necessary pre-condition for most effective DM is the roll out of meters of sufficient sophistication. The roll out of meters is an infrastructure cost and both price and non-price DM are likely to involve increased administrative costs compared to the status quo.[2] Subject to the above conditions, we agree DM options are consistent with a more sustainable and innovative approach to cope with water resource challenges. DM has been adopted extensively in some dryer locations in other countries,[3] and has been emphasised by the regulator Ofwat over the past decade.[4]

1.2 The proposed DM plan, with meter installation as a priority, also appears reasonable given the current relatively low degree of meter penetration in the Thames Water region (c.38%). Increasing meter penetration and combining it with unit pricing is an obvious means to reduce aggregate water demand. Nevertheless, as meters are optional in non-new build properties there may be constraints on their ability to limit/reduce demand. Setting uniformly a higher unit price of water for metered consumers will increase water conservation, but a higher unit price,

[1] Thames Water (2017) Our water resources management plan 2019, Section 0: Executive summary, p.2.
[2] For example, more frequent billing may be required.
[3] For example, Australia, Spain and the US.
[4] Ofwat (2010) Delivering sustainable water – Ofwat's strategy; Ofwat (2015) Reliable services for customers – Consultation on Ofwat's role in resilience.

implies a greater probability that switching to a meter will result in a household seeing an increase in their water bill. Well-informed households facing a higher bill post-meter installation seem unlikely to voluntarily accept the installation of a meter.[5] Unfortunately, these high consumption households are likely to be the ones where the greatest potential water savings are located.

1.3 The currently low meter penetration may also constrain a wider application of non-price DM options, as accurate and frequent consumption measurements can be a pre-requisite for DM methods to be used/to be effective. Not only does Thames Water need to seek the best combination of supply and demand options to secure long-term resilience, there is also the need to choose the best combination of alternative DM options. It is not automatic that a DM approach effective in one region or time period will be effective in all situations. We will comment more on this in Section 3.

1.4 WRMP19 explains the preferred plan has a higher cost than the least cost solution based on water resource development options. The preferred plan is chosen on the grounds that maximising the use of DM options meets consumer expectations and provides better performance. First, this means the chosen plan is dependent on the robustness of the evidence regarding customer preferences and the weightings given to different factors e.g. the environment versus resilience, etc. It seems notable that consumer preferences have only been sought regarding specific programmes of the plan, rather than also seeking views regarding consumers' preferences between the overall plans. The attractiveness of the preferred plan over the least cost solution would seem more robust if consumers had additionally been asked which of the overall plans (including their full costings) was preferable.

1.5 Second, the selection and deliverability of the preferred plan depends fundamentally on the estimated effectiveness of DM. Below we explain how further robust research is needed to understand with confidence the engagement and responses of water consumers.

2. Customers' views on water resources and DM options

2.1 While Thames Water has consulted customers regarding their views of water resource challenges and their preferences over different options, the summary suggests most customers are unaware of these challenges and fail to demonstrate a good understanding of resilience. When the challenges and planning options are presented, customers in all zones strongly prefer DM to water resource development. In particular, the top two preferred options are water efficiency campaigns and reducing leakage. The main reason suggested for these preferences is that consumers consider it important not to waste water.[6] While this may reflect consumers' true opinions, the underlying finding of limited understanding

[5] A higher uniform price also raises fundamental questions around affordability and equity for low income and high occupancy households.
[6] Thames Water (2017) Draft water resources management plan 2019 Appendix T: Our customer priorities and preferences, p.40.

regarding water resource challenges suggests it is probably difficult to predict precisely the responses of consumers to DM interventions seeking to change consumers' water use.

2.2 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)[7] review existing evidence on two particular forms of DM: increasing block tariffs and behavioural interventions. 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.[8] 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.

2.3 That the UK has a temperate climate and the threat of a substantial water deficit is not immediate may explain the currently low awareness of consumers but may also imply the effectiveness of DM in the UK setting is uncertain. Lu *et al* (2018) also highlight research that finds UK households have a low understanding of their water consumption and bills, as well as a limited ability to rank household activities by water use.[9] These findings suggest consumers may need to be educated that water resource challenges are real and immediate before the DM interventions studied deliver significant water consumption reductions.

2.4 Beyond increased metering and leakage reduction, the effectiveness of the other DM options proposed by Thames Water, such as water efficiency campaigns and incentive schemes, depends critically on the interventions' precise design regarding the information messages delivered to consumers.

2.5 We wish to highlight that households' stated preferences for DM options, especially water efficiency campaigns, does not guarantee households will respond in the desired fashion when subject to an intervention. Meeting the targets set out in WRMP19 (in particular the short-term targets) appears reliant on convincing a substantial proportion of consumers that they should care about water resources and be prepared to incur the costs (at least in terms of time and mental effort) of understanding their water consumption.

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[7] Lu, L., Deller D., and Hviid M. (2018) Price and behavioural signals to encourage household water conservation in temperate climates, Centre for Competition Policy Working Paper 18-1. This working paper is based on the Centre for Competition Policy (2017) report Price and behavioural signals to encourage water conservation, commissioned and funded by Anglian Water.

[8] Gilg, A. and Barr, S. (2006) Behavioural attitudes towards water saving? Evidence from a study of environmental actions. *Ecological Economics*, 57(3), pp.400-414.

[9] Waddams, C. and Clayton, K. (2010) Consumer choice in the water sector. Centre for Competition Policy report published by Ofwat as part of Future Regulations project.

3. Programmes seeking to generate behavioural changes

3.1 In this section we comment on how metering, water conservation campaigns and incentive programmes may complement each other when trying to reduce water demand.

3.2 Consistent with its DM focussed strategy, Thames Water has proposed a range of engagement methods to encourage water conservation behaviours. These methods include social media promotion, mailshots, billboard advertising and school educational events, etc.[10] While these cover alternative channels of communication, as important is considering the content of the messages delivered. Lu *et al* (2018) provide a comprehensive overview of the academic evidence in this regard.

3.3 When planning DM it is critical to perform robust trials to establish the effectiveness of the interventions being rolled out. Increasingly the performance of different information-based interventions is assessed through natural or constructed experiments, which allow direct comparison of the conservation impacts achieved by alternative information types in particular settings.[11]

3.4 The existing evidence on behavioural interventions is limited. However, Lu *et al* (2018)'s review points to initial findings[12] that, among the types of information considered, socially comparative feedback, i.e. feedback comparing a household's water use to the average usage of similar neighbours, appears most likely to effectively reduce households' water consumption.

3.5 We think trials of well-designed information-based interventions should be included in Thames Water's water efficiency campaigns for several reasons:

- Compared to large-scale educational campaigns, neighbourhood or household-level interventions can deliver targeted messages that may be considered more relevant by consumers and so more likely to achieve a demand response.

- Trials mean new insights are obtained to identify the most cost-effective way to deliver water conservation messages in different settings and the likelihood that behavioural DM techniques will deliver the scale of water demand reductions required.

[10] Thames Water (2017) Draft water resources management plan 2019 Appendix O: Water efficiency, p.16.

[11] The information types considered in the existing literature range from technical water-saving advice and norm-based conservation messages to different forms of feedback on actual water consumption. See Section 3, Lu *et al*. (2018) for a comprehensive review of the information-based interventions trialled in dryer locations such as Australia and the US, the interventions' effectiveness in reducing household water consumption, and how this effectiveness may depend on household characteristics.

[12] For example, see Ferraro, P.J. and Price, M.K. (2013) Using nonpecuniary strategies to influence behavior: Evidence from a large-scale field experiment. *Review of Economics and Statistics*, 95(1), pp.64-73.

- The trials (and other communications) may help 'set the scene' regarding the importance of water conservation should there be the need to introduce innovative water tariffs at a later date. Setting the scene should hopefully increase consumers' preparedness for possible bill increases in the future and increase their reaction to price signals.

3.6 An obvious challenge to carrying out behavioural interventions in Thames Water areas is that interventions involving usage feedback require metering as a pre-requisite. Nevertheless, trials and behavioural interventions can be performed among those households that currently possess a meter. Learnings from these trials can then be applied to additional households as they adopt meters.[13]

3.7 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. However, any trial of this type would need to be carefully designed to enable identification of the separate effects of metering and behavioural interventions on consumption.

3.8 A second issue is uncertainty around the length of time behavioural change induced in a household will last. Thames Water has flagged in WRMP19 that the total life of behavioural changes resulting from its water efficiency programmes is assumed to be seven years, reduced from a half-life of ten years assumed in WRMP14.[14] The effects generated from information-based behavioural interventions are likely to diminish over time, and the limited existing evidence[15] around the persistence of effects indicates Thames Water's assumption in WRMP19 could still be too optimistic.

3.9 A more general point is that as Thames Water is planning multiple DM interventions careful thought should be given to phasing the introduction of interventions so the effectiveness of individual interventions can be isolated alongside any complementarities/conflicts. The objective of Thames Water must be to find the optimal combination of DM measures. The existing evidence reviewed by Lu *et al* (2018) on price and behavioural interventions suggests a subtle 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, probably due to households investing in water saving devices.

[13] It is important to monitor the performance of interventions in households with newly installed meters as one might suspect that early adopters of meters are systematically different to late adopters.
[14] Thames Water (2017) Draft water resources management plan 2019 Appendix O: Water efficiency, p.21.
[15] Ferraro *et al*. (2011)'s experimental research finds the effect from socially comparative feedback persisted for more than two years but the magnitude of the effect fell over time, but the effects of technical water-saving advice and norm-based conservation messages disappeared within a year. Ferraro, P.J., Miranda, J.J. and Price, M.K. (2011) The persistence of treatment effects with norm-based policy instruments: Evidence from a randomized environmental policy experiment. *American Economic Review Papers and Proceedings*, 101(3), pp.318-322.

Thus combining the two types of interventions could lead to both immediate and sustained water conservation effects.[16]

3.10 Innovative tariff structures are briefly discussed in WRMP19,[17] but it is stated they will not be considered until the 2030s when meter penetration is expected to be at least 65%. We believe it is sensible to be cautious around introducing innovative tariffs, such as increasing block tariffs. While increasing block tariffs are a potential pricing solution that may balance water conservation aims with the affordability of essential water consumption, the empirical evidence on their effectiveness is mixed due to challenges in their design and operation.[18] In particular, not only is metering fundamental to the charging of such a tariff, only once a water company can use meter data to obtain a deep understanding of how different households respond to price changes can innovative tariffs be designed to have predictable effects. The relative difficulty of designing innovative tariffs is a central factor in the attractiveness of achieving DM through non-price behavioural interventions.

[16] Lu, L., Deller D., and Hviid M (2018), p.19.

[17] Thames Water (2017) Draft water resources management plan 2019 Section 8: Appraisal of demand options, p.41-42.

[18] See Lu *et al*. (2018) for a discussion of the operational challenges of implementing effective increasing block tariffs including limits on consumers' decision-making capacity and a review of the existing applications of increasing block tariffs in dryer locations such as Australia, Spain and the US.