Chapter 4

Mobilising the public to reduce household water use in Essex and Suffolk Water

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ABSTRACT

The south-eastern region of the UK is facing water scarcity due to population growth and insufficient rainfall to meet household water demand. One of the regulatory requirements for water utilities is customer engagement to increase water efficiency. This chapter aims to identify key barriers to delivering engagement activities promoting household water efficiency and opportunities for improving practices in Essex & Suffolk Water (ESW) – a UK water utility operating in areas of serious water stress. A reflection is made on the water utility's Every Drop Counts (EDC) home visit campaign, an annual household water efficiency initiative, with particular focus on insights from its face-to-face delivery during Asset Management Plan 6 (AMP6, 2015−2020). The pilot of the EDC campaign's virtual initiative comprising of 66 virtual home visits is examined, with focus on drawing out lessons learned as Asset Management Plan 7 (AMP7, 2020−2025) begins during the coronavirus disease 2019 (COVID-19) pandemic.

Whilst the virtual home visit campaign was found to reach a broader customer base, save financial and environmental costs, and address the season and place constraints typically posed by the face-to-face campaign, fewer water saving devices were installed per property (4.4) compared to the face-to-face campaign (6.4), and calculating measured water savings was impossible due to customers failing to take water meter readings independently during the COVID-19 lockdown. Face-to-face home visits should therefore not mean an end to virtual

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home visits and vice versa, but rather serve as a twin-track strategy for delivering the campaign.

Key strategies that emerged as improving face-to-face home visits in ESW include increasing the use of customer insight; varying the frame for water efficiency communications; improving the face-to-face engagement strategy; enhancing knowledge training; and creating feedback mechanisms between water efficiency managers and plumbers on the frontline. To better maximise virtual home visits, it is recommended that the behavioural change aspect of water efficiency education is delivered as a key and complementary aspect of appointments, and customers are better supported to self-install a wider range of water saving devices.

This chapter bridges the gap between water management theory and practice by providing a better understanding of how practitioners are putting concepts into action on the ground and by so doing, contributes to building a learning culture in the global water sector.

Keywords: water demand, water scarcity, water efficiency engagement.

4.1 INTRODUCTION

Water scarcity is an issue set within a socio-environmental context in the UK. According to the Office of National Statistics (ONS) (2018), the UK population is at an all-time high due to births and immigration outweighing deaths and emigration. The ONS projects that the UK population will increase to 73 million people by 2041, a 46% growth in seven decades. In response to population growth, total household water use is expected to rise. The densely populated south-eastern region of England already has an average annual rainfall which is around 500–600 mm less than Sudan, or Perth, Western Australia. There is therefore insufficient fresh water available to meet people's future needs. Adding complexity to this problem is climate change, which is expected to further reduce supply and may also contribute to increasing demand (Adaptation Sub-Committee, 2016).

Since the privatisation of the UK water industry in 1989, water utilities undergo a 'Price Review' (PR) every five years, wherein the economic regulator, Ofwat, assesses the companies' business plans to set a price limit for water. Following the completion of a PR, the five-year period within which the water utilities deliver their plans is known as the Asset Management Plan (AMP) cycle. The UK water sector completed its seventh cycle of PR in 2019 (PR19) and the delivery of AMP7 is now underway.

The significance of the PR in this discussion is that it defines the period for water resources planning (Hamling *et al.*, 2018). Water resources planning is key for water efficiency engagement because it is the process through which the UK

environmental regulator, the Environment Agency, assesses water utilities' Water Resources Management Plans (WRMPs) to balance water demand and supply. Companies achieve this balance using a range of interventions including water efficiency engagement. For their customer engagement activities during the previous PR in 2014 (PR14), which is discussed below, water utilities were guided by Ofwat's (2011b) policy (which gives guidelines about who to engage, what to engage about, when to engage, and how to engage). And their customer engagement activities for long-term resilience during AMP6 drew guidance from this policy.

Following PR14, the UK water sector regulator, Ofwat, has continued to task water utilities with strengthening their resilience in the face of threats to water resources. An aspect of this requirement is the promotion of water efficiency via 'education' initiatives intended to encourage the public to reduce their water usage. Typically, these water efficiency education activities are expected to increase the public's awareness and knowledge about water and motivate them to change the way they use water with the hope that a reduction in per capita consumption (water usage) is achieved. However, many water efficiency education initiatives fail to fulfil their demand management potential. Difficulties arise because the attention is entirely focussed on the public's responsibility to act for change. The role of water utilities in impacting on the public's water usage and efficiency is not often at the fore of project-planning. There is therefore the potential to increase the effectiveness of utilities' water efficiency education practices.

Essex & Suffolk Water (ESW) is building resilience to water scarcity through water efficiency education on the frontline. However, there is a recognition that details about education strategies and techniques used by water utilities to support household water efficiency are not robustly shared across the water sector, and when shared, do not highlight challenges faced and lessons learned.

Guided by the message-audience-channel (MAC) heuristic for understanding water efficiency engagement, the purpose of this chapter is to present and reflect on ESW's water efficiency education activities, particularly in relation to the Every Drop Counts (EDC) home visit campaign. The MAC heuristic is a framework for examining water efficiency engagement practices in the context of who is engaged, what the engagement is about, and how the engagement is delivered (Ajia, 2021). The water utility's education practices undertaken during AMP6 (2015–2020) are examined. Barriers to effective water efficiency education on the part of the water utility are identified. Practice improvements that the utility implemented during the AMP6 cycle are shared. Further, the challenges to the EDC home visit campaign brought about by the coronavirus disease 2019 (COVID-19) pandemic are identified, and innovations emerging as water efficiency education is delivered in the current Asset Management Period 7 (AMP7, 2020 to 2025) are expanded on.

The next section contextualises the problem of increasing household water demand in the UK. This is followed by a review of the main water efficiency

engagement approaches taken across the water industry in the third section. The fourth section gives a collective account of the EDC home visit campaigns delivered during AMP6 (2015–2020) with particular focus on engagement experiences on the frontline, challenges faced, and learning points. The penultimate section covers how the water utility is adapting water efficiency education considering the COVID-19 pandemic, culminating in a conclusion to the chapter in Section 4.7.

4.2 THE PROBLEM OF INCREASING HOUSEHOLD WATER USE IN THE UK

The Environment Agency and Natural Resources Wales (2013: 2) classified certain areas in the South East of England as experiencing 'serious water stress' because their 'current demand for water is a high proportion of the current rainfall available, and/or because the future household demand for water is likely to be a high proportion of the rainfall available'.

And although eight additional water utilities have been classified as seriously water-stressed for metering purposes, the focus here is solely on classification due to insufficient rainfall to meet water demand (The Environment Agency, 2021). In addition to causal factors such as climate change and population growth, securing the UK's future water supply is challenging due to planning, legal and public challenges that have prevented the building of new reservoirs for decades, low levels of water transfer from areas having surplus water to those in deficit, the non-operation of the major desalination plant in London due to cost implications, wastage of public water supply via leaky infrastructures, and the high levels of water usage in households.

In this chapter, of concern is the centrality of household water use to the issue of water stress in the UK. Evidence from the Department for Environment Food and Rural Affairs (DEFRA) (2018) suggests that while usage in the UK's industrial sector has continued to decrease in recent years, reductions in household water use in recent years have flatlined or even increased. Specifically, in England, the consumption level of an average person (143 litres of water per day) is higher than the UK Government's aspirational target of 130 litres of water per person per day (l/p/d) by 2030 and is also 85 l/p/d higher than the average usage recorded in the 1960s (Lawson *et al.*, 2018). England's average per capita consumption between 2015 and 2020 stalled between 139 and 142 l/p/d. Of greater concern is that in the South East of England, the case study utility, ESW, has seen a steady annual increase in per capita consumption of 1 l/p/d from 2015/2016 up until the outbreak of the COVID-19 pandemic. Since then, ESW has seen an approximate 10% increase in per capita consumption.

Unmanaged household water demand poses a threat to the UK's water security and has been described by authors such as Browne *et al.* (2013) as one of the most significant concerns for UK water utilities. The necessity to act by involving

the public in water efficiency becomes more apparent when the occurrence of drought events (such as seen in 1995–1996, 2006, and 2010–2012) causes the Government and water utilities to call upon the public to urgently reduce its usage. For example, due to dry periods and high levels of water demand, the past two decades have seen increased public appeals by ESW urging people to use water less and differently.

The need to address the problem of increasing household water demand is being driven by regulation. While the water resources planning conducted by UK water utilities for PR09 (AMP5) showed more reliance on supply-side measures than demand-side measures, following PR09, the UK Government advocated increased customer engagement to encourage water efficiency in water utilities (Ofwat, 2011a). A decade ago, Owen *et al.* (2009) conducted research for DEFRA to examine the public's understanding of sustainable water use in the home. The authors found that people were not fully aware of the water situation in the UK and lacked the knowledge and motivation to reduce their usage. Their report attributed high per capita consumption partly to the low value people put on water which means that the public uses the resource without giving much thought to their usage. It is in response to such findings that the Environment Agency and Natural Resources Wales (2013: 4) recommended that in all water utilities, 'there should be some activity to ensure that water is used more efficiently and effectively'. However, a review of seriously water-stressed utilities' plans for water efficiency education in PR14 conducted by Ajia (2018) indicated that the newness of public engagement to reduce household water demand means that the practice in the UK water sector is still in the developmental stage. Post-PR14, water efficiency education in water utilities is being increasingly promoted by regulatory and academic stakeholders in the water industry as a measure to ensure a resilient water system.

Average per capita consumption in ESW in 2019/2020 was 155 l/p/d. The water utility continues to seek sustainable ways to secure future water supplies, and people that save water are a key focus. Amongst other demand-side interventions such as leakage and wastage reduction, using water efficiency education to address customers' water-related behaviours is one way to reduce demand and meet the regulatory expectation to increase household water savings.

The next section reviews more broadly, the demand-side resilience strategies that appear to be prioritised in the water management literature.

4.3 CURRENT WATER EFFICIENCY ENGAGEMENT APPROACHES IN THE UK WATER INDUSTRY

Water efficiency engagement refers to water utilities' actions and interactions to control the public's use of water and motivate behaviours and usage practices that can result in a reduction in per capita consumption (Ajia, 2021). In the UK, water utilities are adopting a twin-track approach (supply-side and demand-side) to

balance water demand and supply and to ensure a resilient water system. Such interventions include seeking new water sources, reducing leakage, increasing meter penetration, and promoting water efficiency. Although water efficiency education is the focus of this chapter, it is useful to reflect on the ways through which water utilities seek to increase household water efficiency in the demand management landscape.

Currently, water utilities use water saving devices, education, and the smart water meter to achieve water efficiency. The reduction in water usage achieved using water saving devices or the smart water meter has been referred to as techno-efficiency by Browne *et al.* (2019) while water savings derived from education that influences the behaviours of water users is understood to be edu-efficiency (Ajia, 2021). Ajia categorises water efficiency engagement into four approaches based on the interventions used to seek water efficiency: technical approach; educational approach; combined approach; and sociotechnical approach. These will now be discussed within the UK context, in turn, in the subsequent subsections.

4.3.1 Technical water efficiency engagement

Technical water efficiency engagement is typified by metering or retrofitting household water systems with water saving devices to reduce per capita consumption.

The water efficiency literature suggests that although the initial aim for metering was to simplify billing, the smart water meter evidently 'motivates' people to reduce wastage and pay attention to how they use water. The UK Government considers metering to be an effective measure for reducing water demand and evidence shows that usage is lowest in the most metered areas (Parliamentary Office of Science & Technology, 2012). This is because installing a smart water meter in a household implies billing accuracy and this has a psychological effect on people. It is as though the smart meter 'speaks' to the public in a language it understands when authors such as Orr *et al.* (2018) assert that metering makes people 'change' their usage pattern so as not to pay more than they desire.

Another popular form of technical water efficiency engagement across all UK water utilities today is the retrofitting of household water systems with water saving devices to reduce the amount of water needed for domestic usage activities. Retrofitting is claimed to be capable of delivering up to 50% water savings (Dworak *et al.*, 2007), although some experimental studies particularly in the UK only reported 4–6% reduction in per capita consumption following the installation of water saving devices in households (Smith & Shouler, 2001; Keeting & Styles, 2004). Reasons for the low yield of water savings from retrofitting can be found in critiques of the water efficiency engagement approach. For instance, Knamiller *et al.* (2006) brought the long-term sustainability of water savings realised through retrofitting in ESW into question when the authors found that water usage returned to historic levels because

people lacked the awareness about their retrofitted devices. Further, Browne *et al.* (2019) criticised retrofitting for reproducing individualistic paradigms of behaviour change.

Collectively, metering and retrofitting interventions to reduce per capita consumption, if done in isolation, present the risk of reducing or completely excluding the interaction between water utilities and the public as such interventions can 'mute' both parties in the engagement process. The challenge is that when people's behaviours and values relating to water use are not addressed, their usage may not change if circumstances were different. For example, the usage of a person living in a metered but rented bills-inclusive property may not decrease because usage is not personally paid for. Likewise, whilst a person's water usage could reduce following the installation of a low-flow shower head at home, their usage attributed to showering may differ when in an environment with inefficient water systems. This raises a pertinent question about what is truly central to the achievement of water efficiency – technology or people, or both?

4.3.2 Educational water efficiency engagement

The consensus amongst social scientists is that addressing people's conscious behaviours is equally as (if not more) important as using technical measures to achieve household water efficiency. This notion has popularised interventions that seek to 'educate' the public about water to motivate them to reduce their usage.

Behavioural change education feeds into DEFRA's wider policy agenda to enhance efficient and sustainable water use by addressing fundamental psychological factors that influence water usage. The educational water efficiency engagement approach is typified by Behaviour Influencing Tactics such as information sharing, awareness building, persuasion and so on, with these strategies embedded in messages communicated to people to cause them to take a desired line of action (see Koop *et al.*, 2019). Unlike two decades ago when drought events in the UK were met with light-touch campaigns such as the distribution of water efficiency leaflets to the public, Waterwise (2013) reported that response to the recent 2012 drought event in the country and other spates of low rainfall seasons have been characterised by media campaigns encouraging the public to change how they use water. Water efficiency education that relies on effective messaging is thus emerging as an influential demand management intervention. An experimental study conducted by ESW in fact showed that customers who received messages relating to behavioural change recorded more water savings (by 7 l/property/day) than those who did not receive any message (Ross, 2015).

4.3.3 Combined water efficiency engagement

More widely, water utilities in countries belonging to the Organisation for Economic Co-operation and Development (OECD) now complement technical measures with

educational interventions to achieve water efficiency (Grafton *et al.*, 2011: 2). This is in essence the combined water efficiency engagement approach.

The compound water savings that can be realised from techno-efficiency and edu-efficiency have inspired increased calls for combined water efficiency engagement in the UK water sector (see Waterwise, 2015). Waterwise's 2015 report demonstrates that water efficiency home visits are by far the most popular type of initiative used by UK water utilities to deliver combined water efficiency engagement on the frontline. In doing so, water efficiency home visits centre around installing water saving devices in households and 'educating' residents about water efficiency.

The challenge with combined water efficiency engagement, however, is that water utilities are critiqued by practice theorists as merely tinkering with water efficiency education. Combined water efficiency engagement is portrayed to be simplistic whereas it can be indeed complex because diverse usage practices mean that utilities tend to engage with people flexibly when using this approach. But water utilities' narrow tactics for educating people about using water wisely render the maximisation of water efficiency challenging. For instance, home visit campaigns still tend to focus more on how devices can assist people to reduce usage and the financial savings that bill-paying customers can make as a result, rather than equally focussing on addressing the complex factors that impact water efficiency such as institutions, attitudes, norms, resources, technology, and water systems. In doing so, these home visit campaigns fail to consider water efficiency as an outcome of public engagement, water management practice, and other externalities as much as it is an outcome of the end use of water. There is therefore a need for practitioners to look at how they engage with the public about water efficiency and seek opportunities to reconfigure day-to-day strategies for encouraging people to think differently about water and their usage. This brings to the fore the relevance of sociotechnical water efficiency engagement discussed in the next subsection.

4.3.4 Sociotechnical water efficiency engagement

Discussions about the sociotechnical approach to water efficiency engagement is new in the demand management literature compared to the other approaches. Sociotechnical water efficiency engagement draws on practice theory which locates water usage within a social and material context (see Browne *et al.*, 2013) and advocates robust tackling of water demand by targeting the multiple socio-material factors that influence patterns of water usage such as norms, values, resources, socio-economic conditions, institutions, environment, technology, and water systems (see Watson *et al.*, 2020).

Sociotechnical water efficiency engagement factors in internalities and externalities that shape patterns of water usage, for example, people's normative beliefs (e.g., linking cleanliness to laundering or showering), age, individual

values, awareness about water, communal values, the nature and extent of water efficiency support utilities provide to people, people's level of trust in their water utility, lived experiences of water restrictions, home ownership, garden ownership, and the presence or absence of efficient water systems in households and so on (see Ajia, 2021). If executed effectively, this approach could bring about a reflexive multi-stakeholder co-production of water efficiency. However, whilst traces of this approach can be found in the UK water industry (e.g., liaisons seen between some water utilities and local authorities and housing associations to enhance water efficiency in social houses), sociotechnical water efficiency engagement is still an aspiration due to its newness.

The next section introduces ESW's EDC home visit campaign as an illustration of water efficiency engagement in practice, including barriers faced on the frontline and practice improvements made during the last AMP6 period, and the state of the matter as the utility is keeping engagement going during the current AMP7 period despite the challenges faced due to the COVID-19 pandemic.

4.4 WATER EFFICIENCY EDUCATION IN ESW

The impacts of climate change and population growth seen in the UK between the 1990s in the forms of low reservoir levels, drought events, and increased water usage motivated ESW to re-evaluate its action plan to increase household water efficiency and create its water efficiency team in 1997. At this time, the water efficiency team distributed water saving packs to households and self-installation of these devices was advised to encourage customers to take responsibility for measuring and reducing their usage. However, the utility's quick recognition that water savings from self-installation of water saving packs had plateaued led to a decision that water efficiency needed to be promoted on a more robust and systematic scale. It was in this light that the H2eco project was developed in 2007, and then redeveloped and rebranded as the EDC campaign in 2015.

The EDC campaign is a novel annual catchment-based initiative forming a key part of ESW's new water efficiency strategy. This water efficiency strategy was to contrast the self-installation approach to supporting the public to retrofit their water systems which was seen decades ago. The EDC campaign seeks household water efficiency via retrofitting and direct public engagement and advice-giving to change how people use water in the home. More broadly, the campaign draws upon wider perspectives that locate water efficiency within the behaviour change context, and its engagement activities seek to target habits relating to patterns of water usage. Whilst the face-to-face water efficiency home visit is the staple of the EDC campaign, it must be noted that the water utility also delivers plays and workshops in schools and holds gardening events and other awareness events in its catchment area to promote key water efficiency messages. Marketing campaigns are also held in public spaces such as town centres to give water efficiency advice and encourage members of the public to sign up for a home

visit. However, these peripheral activities are not the primary focus of this book chapter.

In the summer of every year, qualified plumbers visit households registered for a home visit in a particular town to audit their properties, retrofit their water systems, and have educative conversations with residents about positive behaviours and practices that can yield water savings. Thus, in line with the focus of this chapter, the next subsection reflects on the barriers faced and practice improvements that were implemented by ESW to increase resilience as the water efficiency team and the plumbers worked to deliver home visits during AMP6 (2015–2020).

4.4.1 The home visit campaign during AMP6: barriers faced and practice improvements made

During AMP6 (2015–2020), the EDC home visit campaign was designed and delivered to maximise multiple demand management interventions. In what can be seen as a combined approach to water efficiency engagement, strategies for home visits centred around retrofitting water systems and encouraging people to adopt positive behaviours around water use whilst also promoting the installation of the normal water meter, if necessary, to increase its uptake and maximise water savings.

The water efficiency home visit campaign was delivered in Leigh-On-Sea in 2015, in Lowestoft in 2016, in Witham in 2017, in Barking in 2018, and again in Leigh-On-Sea in 2019 (see Figure 4.1).

A typical home visit during AMP6 spanned 45–60 minutes. On arrival at the customers' homes, the plumbers would introduce themselves and then discuss the aim of the home visit with the residents, drawing upon an engagement script which they had been trained to use. Following a safety assessment, the plumbers would read the water meter if the property has one, and then conduct a water efficiency audit. This audit would entail assessing the property to determine which water saving devices can be installed, after which the plumbers would then retrofit water systems wherever necessary whilst also educating available residents about water efficiency.

In retrospect, significant effort went into the fusion of face-to-face water efficiency education with technical water efficiency engagement during AMP6 in ESW. However, invaluable lessons were learnt from the barriers to water efficiency engagement faced during the annual home visit campaigns. And the water efficiency team saw these barriers as opportunities to improve and maximise engagement techniques on the frontline. These practice improvements concerned: (1) linking household space, instruments of change, and messaging during engagement; (2) raising the stake of the behavioural change education aspect of home visits; (3) enhancing the plumbers as a channel of communication; and (4) improving customer insight development and maximising its use. These practice improvements will now be discussed

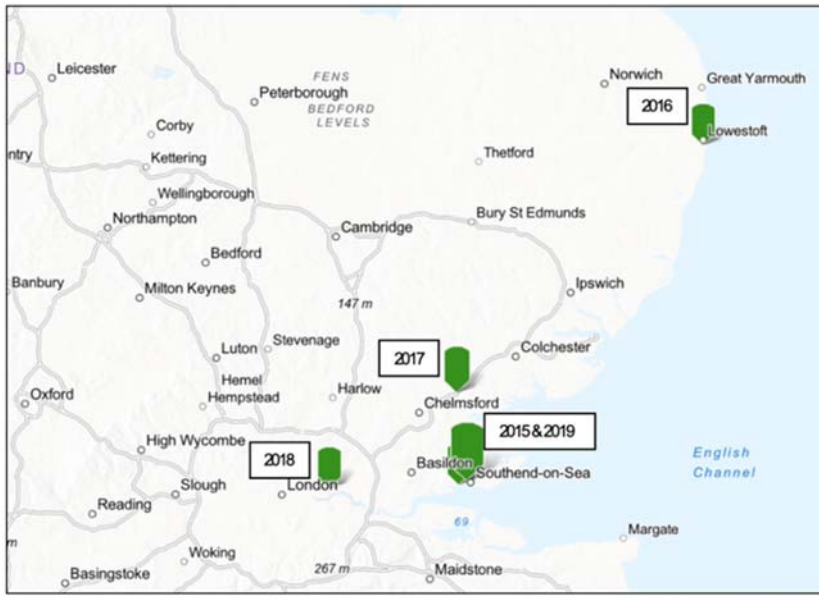

Figure 4.1 Areas where the EDC water-efficiency home visits were delivered during AMP6. *Sources*: Generated by authors.

collectively as they are interconnected in the way they impact the quality of water efficiency engagement.

4.4.2 Maximising the links between household space, water saving devices, and water efficiency messaging

It emerged that the plumbers had a peculiar pattern of movement in and around spaces whilst auditing households, following a set order: retrofitting in the kitchen, cloakroom, toilet(s) and the bathroom(s), and other spaces within the premises such as the garden (Ajia, 2021). Typically, whilst the plumbers were checking for leaks in the kitchen, toilets, and bathrooms, they would check taps in the kitchen and garden; and they would audit cistern(s) and taps in toilets and bathrooms. Upon completion of home audits, the plumbers would give residents non-plumbing water saving devices such as the trigger hose gun, water crystals, bath buoy, plate scraper, and shower timer, and a water butt if required and necessary. Then, the plumbers would also give the residents an information pack containing literature about behavioural change and a product guarantee card to conclude their home visit.

The challenge however was that the plumbers did not always actively *follow the space* in making the connections between the water saving devices being retrofitted

and the key water efficiency messages that could be powerfully communicated in those moments. Observation of the plumbers on the frontline and their own reflections on their engagement techniques revealed some disorganisation between the physical space, water saving device, and message. For example, the use of the shower timer to 'excite' customers rather than being discussed as an instrument to nudge a reduction in showering time, or the assumption that everyone knows the function of a dual-flush rather than probing to understand residents' level of awareness about its use.

4.4.3 Enhancing behavioural change education in the engagement process

The challenge with organising water efficiency conversations with related water saving devices and the physical spaces in households brought the water efficiency team to a realisation that although the plumbers were delivering a combination of technical and educational water efficiency engagement on the frontline, they could benefit from enhanced training around how to motivate behavioural change. The content of the plumbers' training was thus improved to better equip the plumbers with the skills to be able to make linkages between various elements that influence household water usage such as norms, technology, water systems, knowledge, and values. The plumbers were also trained to hold water conversations with residents, whilst concurrently auditing, repairing, and retrofitting water systems, and installing water saving devices, as well as recording installation data (such as measurements, flow rates, leak details, and before and after photographs of retrofitted water systems) in their personal digital assistant (PDA) devices.

4.4.4 Maximising plumbers as a channel of communication

Observation of the plumbers on the frontline and their own reflections on their engagement techniques revealed that they were more confident about the technical aspects of the home visit than about the education aspect of the water efficiency engagement. This is perhaps not surprising for a set of people who have a technical background, with little explicit training in relation to in relation to the educational aspects of their role. The role of the plumbers in the achievement of household water efficiency and the need to maximise this human asset therefore came to the forefront during AMP6 more than ever before.

Considering that existing studies in the environmental literature position personnel on the frontline as a channel of communication (see Mony, 2007; Mony & Heimlich, 2008), the water efficiency team recognised that the plumbers were carriers and influencers of water efficiency messages and engaged with academia to provide them with social science-led training.

The plumbers' training was improved to equip the plumbers with the ability to use communication techniques to keep household residents within proximity

during home visits engaged and encouraged to actively participate in their home visit experience. For example, the format of the plumbers' training was expanded to include role playing so that they could enact and prepare for encounters on the frontline.

Further, a practical aspect of the water efficiency home visit campaign that was inculcated and was increasingly emphasised during the plumbers' training in AMP6 was behavioural change education that is not just about information provision and product demonstration but also dialogue. Of course, information sharing ensures that household residents are aware of the reasons for water saving device installations and retrofits. And such information sharing helps mitigate the risk of a resurging high water usage that may occur when residents lack knowledge about their water efficiency interventions. However, the role of information sharing during home visits in ESW was further enhanced to include dialogue and feedback so that on the part of residents, their appreciation for water increased and on the part of the plumbers, customer insight was gained for the purpose of practice improvement. This reimagining of information sharing during home visits fostered lesson-learning and has increased the co-creation of practice improvement by the plumbers and the water managers which will be discussed in the next subsection.

4.4.5 Customer insight development and use in practice improvement

The water efficiency home visit campaigns during AMP6 exposed how the plumbers were a trove of customer insight for ESW, and how working with the plumbers could help the water utility further improve its practices.

The home visit data recorded in the PDA devices usually centred around the plumbers' arrival and completion times, the size of the household, the number of toilets and bathrooms, the reason(s) why water saving devices were not installed, and photographs of water systems before and after retrofitting and so on. However, whilst these aforementioned data are useful, they provide little understanding of customers' water values, behaviours, and usage.

Although light-touch customer insight came from the customer satisfaction survey administered to households seven weeks after their home visit, it did little to advance the utility's understanding of its customers. The customer satisfaction survey aimed to understand customers' interaction with their newly installed water saving devices, test the effectiveness and sufficiency of the information in their information pack, and understand the unmeasured impact of home visits.

The study conducted by Ajia (2021) revealed that the plumbers were privy to invaluable qualitative customer insight information which was not being captured in the PDA devices, and hence remained unknown to water managers. For example, whilst the plumbers would know who had a garden and may be a suitable invitee for other gardening events to enhance household water efficiency,

such information was not being passed on to the water efficiency team. This is because the plumbers were far removed from designing and project-planning the water efficiency home visit campaign. This barrier was however addressed in real time during the delivery of the 2017 water efficiency home visits in Witham. That year, the water efficiency team created a plumbers' forum to bridge the communication gap between the water managers and the plumbers and this has led to increased feedback and collaborative work between the parties, enhancing the extent of customer insight for practice improvement. This is because the plumbers' forum has offered a regular informal setting for the plumbers and the water managers to share knowledge, reflect on practices and lessons learned on the frontline, and (re)design engagement processes throughout the life cycle of the EDC home visit campaigns.

Having discussed some of the practice improvements that ESW made to water efficiency engagement on the frontline during AMP6, the next section discusses new challenges that have emerged at the beginning of AMP7 (2020–2025) considering the COVID-19 pandemic and pragmatic adaptations being made to the utility's water efficiency engagement approach to maintaining resilience to water scarcity.

4.5 THE HOME VISIT CAMPAIGN DURING AMP7: NEW CHALLENGES AND ADAPTATIONS

ESWs delivery of water efficiency education in AMP7 (2020–2025) has commenced atypically as the world is going through unprecedented times with the COVID-19 outbreak. In March 2020, the water utility paused the planning of the 2020 EDC home visit campaign due to the spread of COVID-19 and the need to put health and safety first. The early pause of the 2020 EDC home visit campaign meant that no arrangements for face-to-face water efficiency engagement were initiated with customers at all, and other demand reduction interventions such as fixing leaky loos in homes and face-to-face water efficiency education in schools were suspended temporarily.

4.5.1 New challenges due to the Covid-19 pandemic

WaterBriefing (2020) reported that in 2020, the UK saw the driest May since records began. The hot summer season also coincided with the first COVID-19 lockdown and widespread public health messages promoting frequent handwashing and general cleanliness to help prevent the spread of COVID-19. Considering that more people were spending more time at home and increasing the frequency of their water usage activities, it is no surprise that the water industry saw an increase of 20–40% in household water use (Water UK, 2020).

A preliminary survey conducted by Essex & Suffolk in July 2020 revealed that the number of customers working from home increased from 7.45% before the first

COVID-19 lockdown to 28.31% after the lockdown. It is thus expected that water usage practices such as cooking, flushing, dishwashing, showering, handwashing, gardening, use of hot tubs, paddling pools and swimming pools would have compounded the demand−supply imbalance faced due to the dry summer and impacted on customers' water bills. And low rainfall meant that whilst outdoor water usage increased, water harvesting using water-butts reduced.

Therefore, whilst a conclusion about the level of increase in per capita consumption particularly in Essex & Suffolk could not be drawn at the time of writing (March 2021), the assumption can be made that household water usage has increased due to transfer of usage from external non-residential spaces to residential spaces.

It must be noted that ESW already had established preparedness measures for meeting increased demand during exceptionally hot and dry summers, and the water utility's leaky loo intervention to repair leaking toilets resumed towards the end of 2020. Nevertheless, it is still imperative that the water utility continues to seek creative and new ways to mobilise the public to reduce their water usage to relieve pressure on water resources and considering that more customers are requesting support to understand why their water bill is rising or to obtain bill payment holidays. Thus, in addition to maximising other alternative modes of customer engagement, such as social media, the water utility launched its virtual water efficiency home visit campaign in September 2020.

4.5.2 The virtual water efficiency home visit campaign

A typical virtual home visit is delivered via video conference (Figure 4.2) on a safe and secure platform. The development of the virtual water efficiency home visit campaign was a collaborative effort between contractors and some internal business functions including the water efficiency team, procurement, marketing and communications, and the systems team. Like the face-to-face home visit campaign, the aim of the virtual home visit campaign was to increase household water savings. The campaign was piloted (from September 2020 to October 2020) in 66 households in 2 rural areas of Suffolk and participants were recruited via email invitation and follow-up phone calls, representing a 3.78% uptake rate.

To commence the home visit process with the plumber at a scheduled time, the customer (usually the bill-payer who agreed to the visit) clicks on a dedicated link which would have been emailed to them previously. Like the face-to-face home visit, the virtual home visit relies on the participation of the customer to conduct an audit of the property, provide tailored water efficiency advice, and identify water saving devices suitable for the water systems in the property such as taps, toilets and showers. Then, the identified water saving devices are posted to the customer to self-install. Whilst the virtual home visit is not an entire departure from the physical home visit experience, distinctions can be inherently found in

Figure 4.2 An illustration of the virtual water efficiency home visit. *Source*: Aqualogic.

its format which causes increased customer involvement during and after engagement has taken place. This is because the plumber is very reliant on the customer to show them around the house and taking water meter readings and self-installation of water saving devices are ultimately up to them – the customer. Although customers are provided with an option for a follow-up video call to be assisted with their self-installation, none of the participants during the pilot of the virtual home visit campaign requested to have one. And follow-up contact with the participants revealed that they were all able to self-install easily.

4.5.3 How success of the virtual water efficiency home visit pilot campaign was measured

ESW does not currently have smart water meters. The calculation of measured water savings is therefore based on manual readings of water meters taken before and after home visits. Due to the COVID-19 pandemic and lockdown restrictions, the water utility did not visit households to take water meter readings during the virtual home visit pilot campaign but relied on householders to do so independently and provide their readings to the utility. There was a low submission rate (for meter readings) as only 10% of participating households provided readings before self-installing their water saving devices. As a result, it was not possible to accurately determine the measured water savings yielded from the virtual home visits.

The level of success of this pilot campaign was determined based on the number of water saving devices posted to households. The newness of the virtual home visit campaign means that opportunities to maximise and improve this form of water efficiency engagement are emerging and the ways to measure effectiveness are still developing. Going forward, the water utility will improve the reconciliation between the aim of the virtual home visit campaign and how performance is measured, and it will strengthen its liaison with householders to determine measured water savings.

Nevertheless, the average number of water saving devices fitted per property during the virtual home visit campaign (4.4) was lower than the average fitted per property during face-to-face home visits (6.4) (Figure 4.3).

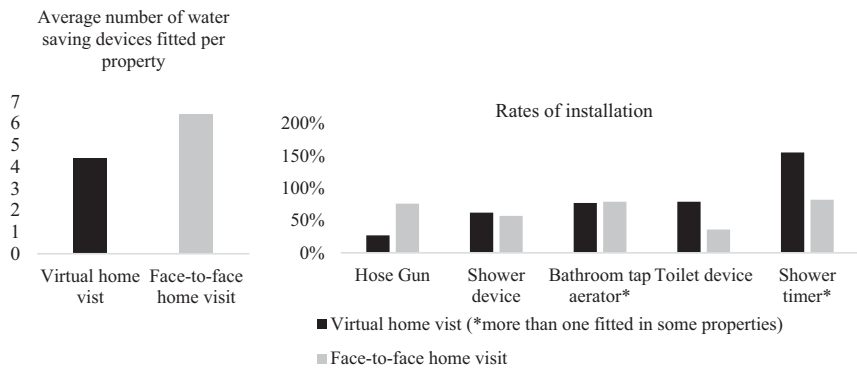

Figure 4.3 Comparison of rates of fitting of water-saving devices between home visit types. *Source*: Generated by authors.

Whilst Figure 4.3 shows similar rates of installation for shower and bathroom devices during the virtual and face-to-face home visit campaigns, it must be noted that the fixing of leaky taps and some water saving devices (e.g., the ecoBETA device for retrofitting single-flush toilets and shower heads) were not provided to properties during the virtual campaign. Also, the rates of installation for the virtual campaign were estimated based on the number of devices posted to properties, not necessarily confirmed as self-installed in properties. This contrasts the rates of installation for the face-to-face campaign which are accurate since the water utility installed the water saving devices.

In view of the above and based on historic data which suggests that face-to-face water efficiency home visits during AMP6 delivered an average measured water saving of 21 litres/property/day, the conclusion can thus be drawn that the unmeasured water savings realised from the virtual water efficiency home visit pilot campaign were lower than the measured water savings from the face-to-face home visit campaign.

4.6 LESSONS LEARNED

Venturing into virtual water efficiency home visits has caused ESW to think more creatively about how water efficiency support can be better provided to the public. The lessons distilled from the pilot campaign include the following eight points:

- Although pausing the face-to-face home visit campaign meant that ESW lost some of the social benefits conventionally gained from delivering peripheral community outreach and marketing events, increasing social media engagement, direct emails, letters, phone calls and text messages to customers has helped the water utility to maintain visibility. Also, the occurrence of COVID-19 has increased the public's awareness of water. Work is therefore underway to find ways to sustain customers' engagement with water efficiency and the water utility on a long-term basis.
- Recruitment of households for the virtual home visit pilot campaign via email was relatively ineffective. The water utility is therefore exploring other recruitment channels to improve the uptake rate for the future.
- Virtual water efficiency home visits contrast the water efficiency engagement that is normally seen in the annual face-to-face home visit campaign which is season-based and town-based. For the future, customers in ESWs catchment area could be engaged regardless of time and place. Given that the water utility has an ambitious goal to engage with every single customer (at least two million participating by 2025), virtual home visit campaigns could increase customer reach through water efficiency engagement.
- On the part of the water utility, virtual water efficiency home visits have led to reductions in travel time to conduct water efficiency home audits, financial and environmental costs, and carbon footprint. These have helped increase ESWs adaptation to uncertainty and shock.
- On the part of the customers, virtual home visits have afforded them greater flexibility as well as increased their involvement in and responsibility for water efficiency. ESW however recognises that visiting households to support retrofitting or to take meter readings ultimately defeats the purpose of the virtual home visit campaign. The effective execution of virtual home visits in the future should therefore include increased support to customers to self-install a wider range of products and to take meter readings independently.
- There was a high uptake of water saving devices to support customers to shower for shorter durations. Work is therefore underway to improve the design and delivery of water efficiency messages around this water usage activity to maximise water savings.
- There was a quick realisation that virtual home visits should not preclude face-to-face home visits and vice versa. Going forward, the virtual and face-to-face home visits will serve as a twin-track strategy for the flexible delivery of water efficiency engagement in ESW.

- Feedback from the virtual home visit pilot campaign suggests that the campaign was satisfactory for supporting customers to determine product suitability and know more about the water saving devices that will be posted to them. However, more could be done to increase the water efficiency education aspect of the campaign. Going forward, ensuring that conversations and dialogue about water efficiency and residents' water usage behaviours occur as a complementary rather than supplementary aspect of virtual home visits will be a priority. In addition, the development and use of insights from water efficiency education during virtual home visits will be prioritised.

ESWs next and immediate plan is to deliver 1350 more virtual home visits to households in Suffolk and more broadly in the water utility's catchment area before the end of March 2021. The water utility's long-term ambition beyond 2025 is to meet the National Infrastructure Commission's target to reduce per capita consumption to 118 l/p/d by 2040 (NIC, 2018). It is therefore crucial that the water utility implements follow-on actions from lessons learned and continues to improve its mobilisation of the public to increase household water efficiency.

The next section brings this book chapter to a close by consolidating how innovation in ways of working on the part of the water utility can contribute to the advancement of water efficiency engagement as a practice.

4.7 CONCLUSION

There is a water scarcity crisis in the UK and water utilities are under pressure to find new and innovative ways to reduce household water usage. During the previous AMP6 period (2015−2020), ESW sought to achieve both techno-efficiency and edu-efficiency. It came to the fore that to advance water efficiency engagement, there is the potential to begin moving towards sociotechnical change. It is beneficial to upskill plumbers in the aspect of water efficiency education; engage with academia during project-planning; and maximise the linkages between staple and peripheral water efficiency activities. Further, the occurrence of the COVID-19 pandemic as the water industry begins delivering the current AMP7 (2020−2025) has shown that uncertainties and shocks, however disruptive, can motivate innovative practice improvement. Emerging ways to further water efficiency engagement as a practice thus include the delivery of virtual water efficiency home visits side by side with face-to-face home visits, and the improvement of the quality of complementary water efficiency education delivered with retrofitting on the frontline. Flexible virtual home visits that are not season-bound or town-specific address the time and place boundaries that accompany face-to-face home visits. This can open opportunities to engage new segments of the public such as working families and rural area dwellers. But it must be noted that virtual water efficiency engagement can exclude other

segments of customers such as other household occupants besides the bill-payer and bill-paying customers who do not have access to or choose not to use online technologies for engagement.

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