Tracking Customer Priorities

Desk Review Report for SSC PLC

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Executive Summary

In developing their business plans, water companies are required by Ofwat to actively and effectively engage with customers and stakeholders in order to gain an in-depth understanding of their needs and priorities. In its customer engagement policy statement for PR19, Ofwat laid out the principles for good customer engagement that would apply to water companies at PR19[1]. This included, among other principles, the requirement for water companies to engage with their customers on a continual and ongoing basis. Continuous engagement is expected to help water companies better understand the change in their customers' priorities and the factors that drives such changes.

As part of this requirement, South Staffs Water & Cambridge Water (SSC) have asked PJM and Accent to conduct research for tracking their customers' priorities on a consistent and regular basis throughout AMP7. The key objective of this research is to understand how customers' priorities have changed since PR19, what has driven these changes and to provide an "early warning" system to highlight changes in priorities over time during AMP7 so as to allow SSC plans to be quickly adapted to align to any shifts in priorities.

Accent/PJM has put forward three key stages of research i.e. desk research, qualitative research, and quantitative research in order to meet this objective. This report focuses on the first stage. Its key aim is to lay the groundwork for the remaining two stages of research by reviewing the following:

- current SSC understanding of its customers' priorities, as reported in SSC research outputs
- methodologies for customer priorities measurement, including a review of research conducted by other water companies for PR19
- Ofwat expectations for PR24, as set out in Ofwat's recent Time to Act strategy paper.

Our report begins with a review of the baseline SSC customers' priorities. In our review, we first present an overview of the customer engagement activities that SSC conducted for PR19 and after PR19 to help identify its customers' priorities. Next, we present a synthesis of findings from these customer engagement activities. For the synthesis, we take each source of SSC customer data, review and extract relevant views and preferences and summarise these to yield the key customer engagement messages.

The synthesis reveals a considerable degree of consistency in SSC customers' priorities expressed throughout the various customer engagement activities. Based on this, we derive a list of core priorities or "hygiene factors" that customers want SSC to deliver on. These "hygiene factors" include:

- high-quality and reliable water supply
- fair, accurate and affordable bills
- great customer service
- reducing leakage on pipes

[1] Ofwat's customer engagement policy statement and expectations for PR19, May 2016

- protecting the natural environment – habitats and water sources and
- helping those customers who may need extra support – both through financial support and other support when needed.

Besides the core priorities, others emerged as future "hygiene factors" through the customer engagement programme. These include:

- giving customers more control of their water usage (e.g. smart metering) and providing education on how to use water responsibly, particularly for the younger generation (16-25)
- planning for population growth and managing the impact of climate change
- ensuring affordability of bills vs ensuring long-term resilience of assets to meet future demand
- meeting the challenge of rising energy costs by lowering carbon footprint; and
- investing in innovation to drive improvements in operational and customer services.

Having identified the key priorities for SSC customers, the next part of the report addresses the question of how to measure SSC customers' priorities during AMP7. This includes a discussion of the requirements for priorities measurement; the types of priorities to be measured; approaches to developing candidate lists of priority areas; measurement techniques, and issues around the aggregation and triangulation of priorities. Our discussion of these areas is based on a review of reports from across the water industry including work conducted by other companies for PR19, and guidance from Ofwat, Consumer Council for Water (CCW) and UK Water Industry Research (UKWIR).

Water companies elicited customers' priorities for a number of purposes at PR19, including to understand attitudes and opinions on specific issues such as water use and efficiency, billing and affordability, and the environment; to better understand the needs and requirements of specific customer and stakeholder groups; and to prioritise over investment options for the business plan and the water resources management plan.

Uninformed research was typically used to obtain high-level, top-of-mind, customers' priorities as a means of understanding customers 'as they are', primarily for communication purposes. By contrast, informed research was used for prioritisation over specific policy choices or initiatives, whilst formal economic valuation techniques, including Willingness-to-Pay (WTP) research, were used where cost-benefit analysis was required to set performance commitment levels, and for the setting of outcome delivery incentive rates. We accordingly recommend that SSC use a mixture of uninformed, informed and economic valuation research for PR24.

In general, water companies used qualitative research methods such as deliberative workshops and focus groups to elicit candidate lists for prioritisation, including for uninformed, informed and WTP research studies. The nature of the lists required varied in each case, however, with successively more information and judgement being required for informed, and then for WTP research.

In the case of WTP research, quantitative uninformed and informed priorities research, in addition to qualitative research, often played a key role at PR19 to identify service measures for valuation. Additionally, some companies developed 'valuation strategies' detailing how the required valuations for cost-benefit analysis and outcome delivery incentives could best be obtained from multiple potential sources.

For the present study, we conclude that a deliberative research approach, as proposed, is appropriate to obtain a list of key customers' priorities that will help guide the development of the quantitative tracking survey for the third stage of our research.

With respect to measurement techniques, a variety of ways were used at PR19, including scoring methods; top 1,2,3; full ranking and the MaxDiff method to measure customers' priorities. An even broader range of techniques were used to obtain economic valuations, including a variety of stated preference and revealed preference techniques plus some innovative alternative methodologies. For the quantitative phase of the present study, we recommend using the MaxDiff method to track and measure key customers' priorities throughout the AMP7 period. This method is evaluated as being objectively superior to other comparable methods for priorities measurement.

With respect to WTP measurement, we recommend using a stated preference (SP) methodology as the core technique for measuring WTP for service level changes at PR24, supplemented with additional revealed preference, wellbeing research, further stated preference research, and/or value transfer/SROI analysis to the extent that the research budget allows.

Two other important issues related to customers' priorities are aggregation and triangulation of priorities. Aggregation of customers' priorities is an important element of business decision making. Although in many cases, one might take a majority, or average, viewpoint as the 'voice of the customer', a monopoly water company may sometimes choose to take a different line, for example giving greater weight to vulnerable customers. This is likely to have implications for an optimal sampling strategy insofar as it would imply the inclusion of more vulnerable customers in the sample than there are in the population.

With respect to triangulation, we recommend using both qualitative and quantitative approaches to assemble and triangulate priorities on an ongoing basis, in line with CCW guidelines[2] and the Accent-PJM approach developed for SSC at PR19[3]. Qualitative approaches involve taking each source of customer evidence, extracting the relevant views and preferences and then creating a qualitative synthesis of customer insights around business plan outcomes. Quantitative approaches involve utilising a range of data sources to obtain estimates of, and ranges around, key quantitative measures such as willingness-to-pay (WTP) values for service improvements.

In summary, this report provides an up-to-date view of SSC customer priorities and offers insights into how customers' priorities should be identified, measured, aggregated and

[2] ICF (2017) Defining and applying triangulation in the water sector, 7 July 2017, Report for Consumer Council for Water.
[3] Accent-PJM (2018) PR19 Data Triangulation, July 2018, Report for South Staffs Water.

triangulated. These insights should provide a robust basis for developing the subsequent stages of the study.

1 Introduction

1.1 Background

During PR19, South Staffs Water PLC (SSC) employed both qualitative and quantitative approaches to measure the priorities of its customers, and brought all the evidence together within an innovative triangulation framework to ensure that customer insight was collated and used effectively within its business plan. SSC now wishes to embark on a strategy to track customer priorities on a consistent and regular basis throughout AMP7.

The following business objectives are sought:

- Understand how customers' priorities have changed since 2017, and what has driven these changes
- Provide an "early warning" system to highlight changes in customers' priorities over time during AMP7 to allow plans to be quickly adapted to align to any shifts in priorities
- Make customer priority tracking business as usual as a means to better inform and also reduce the large investment needed for willingness to pay (WTP) studies, which will likely be needed as part of PR24.

To ensure that the research is designed and undertaken using best practice approaches, the first stage of the process needs to include a review of work conducted by SSC and other water companies into customer priorities' measurement. This will enable lessons to be learned from the wide range of work that has been undertaken for PR19 across the industry.

1.2 Objectives

SSC have put forward three key stages of research i.e. desk research, qualitative research, and quantitative research in order to meet the requirements of the study. The key objective for the first stage of research, on which this report is based, is to lay the groundwork for the remaining two stages of the study.

This report achieves this objective by reviewing the following:

- current SSC understanding of its customers' priorities, as reported in SSC research outputs
- methodologies for customer priorities measurement, including a review of research conducted by other water companies for PR19
- Ofwat expectations for PR24, as set out in Ofwat's recent Time to Act strategy paper.

1.3 Report Structure

In line with the overall objectives of the research, this report begins with a review of the work conducted by SSC into customer priorities' measurement to date. This is contained within Chapter 2, which includes a synthesis of SSC customers' priorities and values as currently understood.

Next, in Chapter 3, we discuss the key issues and methodologies pertinent to the research design for tracking SSC customers' priorities during AMP7.

Chapter 4 concludes and provides recommendations for the second and the third stages of the study.

The Appendix to this report contains summaries of customer engagement activities conducted by 16 water companies to identify and establish their customers' priorities for PR19 alongside a summary of Ofwat's response to the submission in its Initial Assessment of Plans.

2 Baseline SSC Customer Priorities

2.1 Introduction

This section presents a synthesis of the work conducted by SSC into customer priorities' measurement for and after PR19. For the synthesis, we take each source of SSC customer data, review and extract relevant views and preferences and summarise these to yield the key customer engagement messages.

2.2 Overview of SSC Research

SSC conducted an extensive programme of customer engagement that informed its PR19 business planning process. A wide range of customer evidence was used to deliver on its business plan outcomes which included, identifying customer priorities, assessing the value that customers place on service improvements, reshaping customer experience, defining customer promise and validating the business plan and strategy.

The following lists the engagement activities that SSC conducted for and after PR19 that helped identify its customers' priorities.

- Qualitative Foundation research to establish customers' priorities
- Quantitative Customer priorities research to validate customers' priorities
- WRMP research to obtain customer priorities on a range of supply-side and demand management options
- WTP core research (two waves) to understand customer priorities for investments and charges across a range of service measures and a performance commitment slider study to develop some of SSC's performance commitments with regards to the levels of stretch.
- Customer Tracking research to monitor customer satisfaction against three key metrics i.e. overall service satisfaction, value for money and affordability and brand perception and trust and to obtain customer perceptions of SSC service performance
- Customer contacts and complaints
- H2Online Customer community priorities research to understand customers' priorities and gain their feedback on service issues
- Customer forums to understand customer views regarding SSC service and encourage discussions around how to build water efficient houses

- Retail Operational Plan
- Deep dive study focussed on hard-to-reach customers to understand their priorities and service expectations
- Non-household retailer engagement to improve service delivery and define performance commitment
- Young Innovator's panels comprising of sixth form school students to understand their views and priorities regarding services
- PR19 data triangulation study focussed on developing a robust customer priority index, by region, with respect to water resources management plan (WRMP) supply and demand supply options and developing a robust and proportionate evidence base on customers' WTP for different areas of investment.

Details regarding these research studies are presented in the Appendix.

2.3 Synthesis of Customer Priorities

The findings from the above customer engagement activities can be synthesised and brought together within a qualitative triangulation framework to identify key customer priority areas.

At the start of its PR19 customer engagement process, SSC conducted a foundational research study that focused on:

- understanding customers' attitudes to water
- understanding customers' brand and service perceptions of SSC
- exploring customers' uniformed and informed views of their priorities for investment, now and in the future
- understanding customers' views around whether SSC offered value for money.

The foundational research revealed the following key uninformed priorities that were found to be consistent across all customer groups i.e. household and non-household customers including hard-to-reach and future bill-payers:

- quality of water
- continuity of supply
- customer service
- fair and accurate billing
- investment to maintain and improve infrastructure
- reducing leakage-especially among older household and larger business customers.

The above priorities which were previously identified as key priorities in the SSC PR14 research were now identified as "hygiene factors" that customers wanted SSC to deliver on. The research also revealed that customers were now expecting SSC to deliver on some

additional key priorities which were not mentioned in their PR14 research and which included:

- investment in innovation, covering education (i.e. information and advice to help them have more control of their water usage e.g. providing smart meters); built-in water recycling systems (for new builds/refurbishments and other rainwater harvesting solutions to reduce demand) and infrastructure and operations (such as more resilient materials for pipes and use of alternative energy sources to power the network)
- addressing environmental factors and the impact of climate change.

Once customers were prompted with relevant information, there appeared to be a shift in some of the priorities with the following moving up the list:

- planning for population growth
- assisting vulnerable customers
- managing the impact of climate change
- protecting and enhancing the natural environment
- managing the impact of increasing energy costs
- ensuring financial stability
- ensuring affordability of bills vs ensuring long-term resilience of assets to meet future demand.

However, the core "hygiene factors" remained at the top of the list of priorities for the majority of the customers.

The Foundation research study revealed that customers considered their water bill good value for money. Further it was found that the majority of customers provided good feedback on service performance and positive brand perceptions but viewed SSC as a "hidden brand".

In order to validate findings from the Foundation priorities study, SSC conducted a Customer Priorities survey which resulted in a list of key uninformed priorities shown in Table 2. A comparison of the Foundations and Customer priorities research results shows that the provision of a high-quality water supply was ranked as the highest priority by customers in both studies. The other top priorities that emerged from the Foundation research i.e. continuity of supply, leakage, fair and accurate billing and planning for the future were also identified to be the top priorities in the quantitative priorities study.

Following the Foundational research study, customers were continually asked about their priorities in different contexts to identify if there were variations in their priorities. This process was initiated via the WRMP research studies which included deliberative workshops, an online survey and roundtable events with stakeholders and large business customers.

The top priorities revealed at the start of the WRMP workshop were[4]:

[4] Note that the list provided to customers in the workshops did not include reliability of supply. However, when asked about this service measure, customers in the WRMP groups identified it as a key priority area.

- ensuring water quality
- keeping bills affordable
- reducing leakage.

At the end of the workshop, once customers were provided with relevant information, their priorities were reassessed. In both the SSW and CAM regions, this led to an increased importance being placed on the following two measures:

- encouraging people to use less water and
- installing more meters.

The key unprompted and prompted priorities that emerged from the WRMP workshops were consistent with the priorities expressed in the Foundations priorities and the quantitative customer priorities research.

In the follow-up WRMP online survey, customers expressed their priorities for the various demand management and supply-side options presented to them within the survey. The results of the survey are shown in Figure 1, found in the Appendix.

The key priorities that emerged from the WRMP online survey was consistent with the unprompted priorities expressed in the WRMP workshops in that water quality, affordable bills and reducing leakage were found to be the top 3 priorities. However, encouraging people to use less water and installing more meters were voted as low priorities in the online survey which was inconsistent with the prompted priorities expressed in the WRMP workshops.

The key unprompted priorities that emerged from the roundtable events with stakeholders and large business customers, were largely similar to the unprompted priorities expressed in the WRMP workshop.

Following the WRMP research studies, SSC conducted its WTP research to understand both household and non-household customer priorities for investments and charges across a range of service measures. The results of the core WTP research is shown in Figure 2 and Figure 3.

The key priorities resulting from the (Wave 1) WTP research were related to water quality and reliability of water supply:

- For household customers, water not safe to drink emerged as the top priority, followed by unexpected loss of water supply, taste and smell and lead pipes.
- For non-household customers, the top priorities included taste and smell, water not safe to drink, discolouration of tap water, water hardness, loss of supply and lead pipes.

These results were consistent with the findings from the Foundations research. However, lead pipes did not emerge as a priority from the Foundation research, thus suggesting

that customers may not place much importance on this area until they are informed about this issue.

SSC conducted a performance commitment slider study to help them evaluate the extent that customers wanted to achieve for 11 of their performance commitments and also help them understand how much customers would like SSC to spend for each of these performance commitments to deliver the service that they want. The main output from this survey comprised the service levels chosen by the respondents and their associated bill amounts. The insight from this research was used to develop some of SSC's performance commitments with regards to the levels of stretch – specifically, in the case of leakage in the South Staffs region and the scope of SSC's education outreach programme.

In addition to conducting bespoke customer research, SSC also utilised customer satisfaction and daily contacts data to better understand priorities. For example, an analysis of SSC unwanted contacts revealed key priorities that included unexpected temporary loss of water supply, discoloured water, bad tasting or smelling water and low water pressure and fair and accurate billing. These findings are consistent with the core priorities that emerged from the Foundational customers' priorities research.

An analysis of household customer complaints provided an indication of customers' priorities that included, among others, good customer service and fair and accurate billing. Again, these matched closely with customers' priorities expressed through the previous research activities.

Both the customer service tracker analysis (conducted from 2017-2019) as well as the Customer tracking research (conducted in 2019/2020) revealed key customers' priorities to include water quality, reliability of supply, leak repairs and offering a value for money service. All these service measures correlate closely with the core priorities expressed via the Foundational research thus indicating a consistent theme.

The H2Online Customer community which has been set up recently by SSC to engage in a two-way dialogue with its customers. This included SSC-led and member-led discussions.

- The three areas initiated by SSC that attracted the highest number of responses were 'how often should they read water meters', 'what are your thoughts on going paperless with bills?' and 'New CAM logo - part 1'. The topic areas attracting the lowest number of responses were 'how is life in lockdown? – discussion', 'assure communications campaign – SSW' and 'great customer service'.

- The top three topics of member-led discussions were billing issues and frequency/charges, water meters – location and lack of reads and the perceived high cost of water. The bottom three topics of member-led discussions were satisfaction with supply reliability, poor customer service experience and Covid-19.

With respect to the ranking of member-led discussion areas, we note that these are in contrast to the findings of the Foundation research in which customer service had emerged as one of the core priorities and water metering was an additional important

priority. However, it is important to note here that the H2Online Customer community is a self-selected sample of customers who are more tech-savvy and more likely to have a meter than the customer base as a whole. Hence direct comparisons of the findings from the H2Online Customer research with the Foundation research should be treated with caution.

Furthermore, although Covid-19 emerged as one of the least discussed areas by online customers during the trial period from November 2019 to end of March 2020, it is nevertheless reasonable to assume that there may be significant changes in customers' priorities in the near future owing to this crisis. In fact, very recently SSC, via their H2Online Customer community, sought feedback on their Covid-19 response plans which garnered significant attention from customers. In a recently published report by Frontier Economics (2020), it has been suggested that water companies should build a robust evidence base to enable Ofwat to adopt the most appropriate regulatory steps in response to the crisis. This evidence base should involve details of innovative activities undertaken by water companies to deal with the crisis, changes in customer preferences and behaviour due to the crisis, dealing with bad debt, etc.

In addition to the above engagement activities that involved household and non-household customers, SSC has conducted several other research projects to better understand priorities for specific groups of customers such as vulnerable customers, future household customers and non-household/business market retailers. These projects have been aimed at understanding priorities and customer experience in order to provide tailored and personalized services to these customer groups.

SSC held qualitative interviews with NHH business retailers in April 2018. The key objectives of this engagement were to explore perceptions of the SSC brand as a wholesale provider and to understand the aspects of service provision that NHH retail customers valued the most. The main priorities that emerged from this engagement included the following:

- desire for a consistent approach across the water industry, in terms of RMEX, online portals, processes, etc.
- ongoing regular and ad hoc communication to keep retailers updated and
- having a known contact that can be reached quickly

SSC conducts ongoing point of contact surveys with its household customers. The survey results were analysed via a correlation analysis. An analysis of rolling 12 months of survey data (Feb 2019 to Jan 2020) showed that the key drivers of overall satisfaction related to customer services were:

- first contact resolution e.g. whether issue has been resolved?
- customer effort e.g. how easy was it to resolve the query?
- knowledge e.g. how knowledgeable was the customer representative?
- professionalism - e.g. how courteous and professional was the representative?

SSC also conducted a deep dive study focussed on hard-to-reach and vulnerable customers in 2018 to understand their priorities and service expectations. Consistent with

the findings based on the Foundation, WRMP and WTP research as well as the customer tracker and daily customer data, the deep dive study found that reliability of supply was the highest rated priority for financially vulnerable customer segments. These included:

- Unexpected temporary loss of supply
- Low water pressure (SSW only)
- Traffic disruption
- Temporary use ban (only for significant improvement)
- Environmental: managing impacts on rivers and streams and renewable energy (less consistent).

SSC conducted specific research to understand the views and priorities of future bill-payers regarding services and expectations. In addition to including future customers in the Foundation and WTP research, SSC formed a Young Innovator's panel comprising of sixth form school students to educate and raise awareness regarding water usage and understand their priorities. Overall, it was found that future customers prioritised environmental issues, taste & smell and giving customers control of their water services.

Therefore, findings from the engagement activities involving vulnerable customers, future household customers and non-household/business market retailers indicates supply reliability and great customer service to be the top priorities, which is consistent with the findings from the Foundation research. However, the highest rated priority of future customers is protecting the environment, which should also be considered as a core "hygiene factor".

In addition to the engagement activities related to priorities, SSC developed a robust customer priority index, by region, with respect to WRMP supply and demand supply options. This index was used to fully reflect customers' preferences within SSC's Multi Criteria Analysis investment tool.

The customer priorities that emerged from the WRMP triangulation work is shown in Figure 4 and Figure 5. The customer priorities index showed that increased metering and leakage were the highest rated priorities for SSW while building a new reservoir and reducing leakage were the highest rated priorities for CAM. This is consistent with the core priorities expressed via the Foundational research.

Overall, therefore, a considerable degree of consistency was found in customers' priorities expressed throughout the various customer engagement activities[5]. Based on the synthesis, we are able to derive a list of core priorities or "hygiene factors" that include:

- high-quality and reliable water supply
- fair, accurate and affordable bills
- great customer service
- reducing leakage on pipes

[5] Note that the list of core priorities and additional priorities derived from our synthesis is similar to the list developed by SSC for PR19 (see Appendix A2: Identifying customer priorities)

- protecting the natural environment – habitats and water sources and
- helping those customers who may need extra support – both through financial support and other support when needed.

However, some variation in priorities were noticed across the customer groups which included:

- SSW customers placed more importance on water quality and affordable bills while Cambridge customers placed more importance on reducing leakage and protecting the environment.
- business customers placed more importance on reducing leakage. Further, unlike household customers who placed the highest level of importance to water safety, business customers assigned broadly similar levels of importance to water safety, taste and smell, loss of supply, lead pipes, use of renewable energy, discolouration and water hardness.
- hard-to-reach customers placed more importance on providing financial and other support to vulnerable customers and customers aged above 60 years were more likely to choose leakage as one of their top priorities.
- future customers (i.e. 18 - 25 who are yet to start paying a water bill) consistently placed more importance on protecting the environment and delivering services through digital platforms. This was consistent with the priorities expressed by the 19, 16-17-year olds, who took part in the first SSW first Young Innovators' Panel.

Besides the core priorities, some other important priorities also emerged as future "hygiene factors" through the customer engagement programme. These included:

- giving customers more control of their water usage (e.g. smart metering) and providing education on how to use water responsibly, particularly for the younger generation (16-25)
- planning for population growth and managing the impact of climate change
- ensuring long-term resilience of assets to meet future demand (whilst balancing this against the need to ensure affordability of bills)
- meeting the challenge of rising energy costs by lowering carbon footprint
- investing in innovation to drive improvements in operational and the services.

Some of the aforementioned priorities such as strengthening long-term resilience of assets to meet future challenges related to climate change and population growth, making the environment central to all water sector activities and driving improvements in customer engagement activities that meet needs of the diverse water customer base including vulnerable customers have been highlighted by Ofwat as key areas that water companies need to focus on for PR24 (Ofwat, 2019).

Having identified the list of key customers' priorities for SSC, we provide a discussion of some key issues pertinent to the tracking of SSC customers' priorities during AMP7 in the next section.

3 Tracking Customer Priorities for AMP7

3.1 Introduction

This section discusses key issues pertinent to the tracking of SSC customers' priorities during AMP7. The following issues are discussed:

- Requirements for priorities measurement
- Developing candidate lists of priority areas
- Types of priorities: informed and uninformed
- Measurement of priorities and WTP
- Aggregation and equity
- Triangulation of priorities.

3.2 Requirements for Priorities Measurement

Customers' priorities are measured by water companies for a number of purposes which include, among others:

- to gain a general understanding of customers' issues and concerns regarding service expectations and explore their attitudes and opinions on business priorities such as affordability, water efficiency, the natural environment etc.
- to better understand the needs and requirements of specific customer and stakeholder groups e.g. vulnerable customers, future customers, customers on social tariff, customers from lower socio-economic backgrounds and ethnic minority groups, customers disrupted by supply interruptions, water retailers.
- to estimate the WTP or economic value that customers place on water and wastewater services. The resultant WTP valuations help water companies understand the benefits of investments that improve or maintain service levels. These WTP valuations ultimately feed into the Cost Benefit Analysis of investment options which helps water companies to prioritise investment across the range of services they provide (e.g. wholesale, retail; water, wastewater) and is used to set performance commitments (PC) and incentive rates (ODIs).
- to obtain priorities among the WRMP demand management and supply-side options for effective water resource planning.
- to gain customer and stakeholder views on services received, value for money, reputation and rating as a corporate citizen
- to gain a better understanding of customers' billing preferences i.e. what they don't understand about their bill, what they would prefer to see on their new bill, test proposed new bill design etc.

In addition to eliciting priorities, water companies are required to triangulate their findings to "build a robust, balanced and proportionate evidence base to genuinely understand their customers' needs and requirements" (Ofwat, 2016)[6].

Recommendations

Although identification and measurement of water customers' priorities is a key requirement for business plans, the regulatory requirements are not always well specified. Water companies must develop for themselves, in conjunction with their customer challenge group, a framework for ensuring priorities are well measured and applied in business plans.

The remainder of this section discusses issues around the types of priorities that will be required in relation to the above areas, assuming a similar set of requirements for PR24 except where noted on the basis of more recent reports.

3.3 Types of Priorities: Informed, Uninformed and WTP-Based

Once the areas for which customers' priorities are sought have been identified, water companies need to decide whether to measure informed or uninformed responses from customers and stakeholders. Informed priorities are based on questions that give customers relevant information about the service area such as the current service level, possibly in comparison to the rest of the industry, and the cost of any potential improvement as well as details of what improvement they might expect to see. Uninformed priorities, by contrast, are those gathered from unprompted questioning or questions regarding a simple list of service areas/initiatives with no detail.

The recent Blue Marble study for CCW[7] makes several recommendations on these issues. The study recommends using uninformed responses for business-as-usual activities such as understanding and improving responses to service failures, obtaining high-level views about water companies e.g. trust in water companies and evaluating business plans e.g. bill preference and acceptability research. To elicit such uninformed responses, the study emphasises the use of well-presented, accessible and high-level surveys to obtain top-of-mind customers' priorities for the wide range of service areas/initiatives.

The Blue Marble study recommends using informed responses for research on specific business plan areas such as WTP, future resilience and performance incentives. The study argues that since these are highly complex and technical aspects of a business plan, informed responses are essential for the research output to be meaningful and valid.

The study recommends using deliberative approaches (which includes accessible, visually engaging and effective survey materials such as videos, display boards, showcards etc.) and online consumer panels consisting of 'expert consumers' to elicit informed responses

[6] Ofwat's customer engagement policy statement and expectations for PR19, May 2016
[7] Blue Marble (2020) Engaging water customers for better consumer and business outcomes, Report for CCW, May 2020.

on important topics, obtain feedback on proposed policies and track customers' priorities and attitudes over long periods of time. The study does not, however, mention anything regarding what information should be given to customers to elicit informed priorities or the recommended balance between uninformed and informed responses in water sector research.

Our review of PR19 research shows that water companies used uninformed research to obtain high-level customers' priorities and informed research to identify customers' priorities regarding specific areas of their business plans. Uninformed customers' priorities were, in general, used to determine the outcomes for business plans, based on which water companies developed their performance commitments for PR19. Informed priorities were elicited to gather customers' views and opinions on specific aspects of the business plan. WTP valuation results were utilised to set performance levels and rewards and penalty rates.

Our review of PR19 research also reveals examples of the type of information that was provided by water companies to obtain informed customers' priorities. For example, as part of its PR19 research, SES Water conducted workshops to obtain customers' views and acceptability of their 'Helping Hand Scheme'. This scheme was designed to provide support to financially vulnerable customers. Since not all customers were aware of this scheme, it was important for SES Water to provide them with the relevant information. In order to obtain informed responses, SES Water, therefore, presented the workshop participants with information on what constitutes financial vulnerability, background on social tariff including Defra's role in it, SES Water's current scheme and eligibility conditions as well as the different funding options. Once customers were prompted with such information, they endorsed this as a priority service and expressed their willingness to contribute to the scheme. SSC followed a similar approach in its latest social tariff contribution testing in 2019.

Another relevant example is the focus groups conducted by Northumbrian Water (NWL) to understand customers' priorities regarding leakage, resilience and the environment. Initially participants were asked to rate their priorities without access to any relevant information. However, once NWL presented relevant comparative and cost information to participants, they were able to take more informed decisions and thereby revise their priorities for e.g. when initially asked about leakage, the majority of the participants remained unconcerned. However once participants were presented with the relevant information, more than two thirds of customers opted to bring the level of leakage down.

Our review also revealed examples of studies wherein water companies tested the effects of framing in the information that was provided to customers for elicitation of informed priorities. For example, Yorkshire Water conducted a behavioural experiment to estimate values that customers place on changes in service levels. The behavioural experiment took the form of an interactive online tool, which allowed participants to adjust service levels and observe, in real time, the effects that this has on their bill. The study tested the impacts of alternative ways of presenting the choices to respondents. This included testing the impact of three alternative treatments on the amounts that customers said they wanted to see their bills change by:

- Showing respondents the impact of bill changes on their disposable income

- Showing respondents comparative information on industry average service levels and
- Changing how the likelihood that unlikely events will occur is presented. Specifically, attribute service levels that involved low probabilities were presented as frequencies instead of quantities (e.g. instead of how many properties are affected per year, respondents were told every how many hours a property is affected).

The findings that emerged from this study revealed the following:

- At the aggregate level, the disposable income treatment did not have a significant impact on the chosen service levels
- Results for the comparative industry positions treatment revealed a higher tendency for participants' chosen service levels to cluster around the industry average when this information was shown.
- Reframing the service levels of the relevant attributes as frequencies (rather than quantities) had a statistically significant impact on the service levels chosen for a number of different attributes. In particular, a worse level of service was typically chosen when the levels were reframed in terms of frequencies. However, the service level treatment effects were not matched by statistically significant chosen bill changes from the reframing of the service level attributes. Further, it was found that presenting the attributes as frequencies instead of quantities made respondents less able to understand the choices.

Water companies balanced the use of both uninformed and informed research to obtain customers' priorities and values. In some cases, informed research stemmed from uninformed research. For example, most water companies including SSC, Anglian Water, Northumbrian Water and Welsh Water used uninformed research (and business-as-usual research) to help identify and confirm a list of high-level priorities which were then used to determine the list of PR19 performance commitment measures for subsequent customers' valuations studies.

In other cases, uninformed research has been used to test key findings from informed research. For example, several water companies have used uninformed research to test the acceptability of their business plans. The acceptability testing of plans in this manner was considered to be suitable for replicating the experience of the majority of customers who did not have sufficient information about the price review process.

In addition to eliciting uninformed and informed priorities, water companies also engaged with customers to obtain their WTP for service improvements. WTP measures and customers' priorities are fundamentally related to one another as both drive customers' viewpoints within business planning. Importantly, customers' priorities depend on cost as well as benefit and so an understanding of cost curves is potentially important to feed into a prioritisation exercise. Put simply, the economic order of priority with regard to company expenditure is given by dividing marginal WTP by marginal cost. This gives the benefit per pound of expenditure, and an economic priority order is given by the ranking of potential service improvements in terms of the benefit per pound spent.

A review of the PR19 research shows that water companies measured customer priorities separately from WTP. In the initial phases, water companies used customer engagement activities to identify a list of customers' priorities. These customer priorities were then

used to determine the list of PR19 performance commitment measures. Subsequently, these measures were either combined with the core WTP measures in a triangulation framework to produce robust measures of customers' priorities or they were used to cross check or validate the triangulated WTP results.

Recommendations

In line with the Blue Marble study, we recommend using uninformed research to obtain high-level customers' priorities and informed research to identify customers' priorities regarding specific areas of their business plans. Uninformed priorities should be used to inform communications with customers, and to provide a steer on company decisions where detailed information is not necessary, for example preferences over customer service options. Informed priorities, by contrast should be relied upon to steer key company decisions where information/education is necessary to suitably understand the decision being faced by the company, for example WRMP options.

We recommend using qualitative research methodologies to establish and understand both uninformed and informed priorities of customers, both in the short and long term. Specifically, this involves understanding the following keys areas of importance:

- what are customers' uniformed priorities (short term and long term)
- what are customers' informed priorities (short term and long term)
- what factors drive any changes in priorities between uninformed and informed priorities
- understand which priorities are driven by conscious vs unconscious needs
- how have these priorities changed since PR19 and what has driven these changes?
- understand what are the "hygiene factors" which is what we define as an area (e.g. water quality, supply interruptions) that the vast majority customers are no longer willing to accept any deterioration of service standards vs second tier priorities
- For hygiene factors – to understand what impact (if any) macro trends are having on customers' priorities – e.g. Southern Water scandal, COVID, etc.

The process of developing the candidate list of such priorities is discussed in the next section.

3.4 Development of Candidate Lists for Prioritisation

Water companies develop their candidate list of priorities based on the specific context for which such priorities are required. Uninformed priorities are usually obtained to understand customers' top-of-mind views regarding their experience and expectations of the service that they receive from water companies and their general attitudes and perceptions to business priorities such as affordability, water efficiency, natural environment, social tariff etc. A review of the PR19 business plans indicate that water companies have conducted traditional and innovative qualitative engagement activities to obtain uninformed priorities. Examples of traditional activities include ethnographic interviews, 'signpost' discussion groups, focus groups, customer forums and deliberative workshops. Examples of innovative engagement activities include bus tours, water

festivals, customer surveys at various public events via Facebook 'Chatbot' (see Figure 8); customer workshops in which participants write a postcard to a friend or record a 'water moments' diary-for-a-day (see Figure 10 and Figure 11); board engagement programmes in which board members actively engage with customers via multiple channels such as customer events, contact centre visits, customer open days and magazine surveys that include questionnaires (see Figure 17) in company magazines.

Informed priorities are developed to gain customer feedback on specific aspects of the business plan such as bills and affordability, metering, water quality, vulnerability issues etc. Given that the water sector is regulated, customers are usually not aware about what their water company is responsible for and often have little interest in its activities. Since specific aspects of the business plan can be highly complex and technical, informed responses are essential for the research output to be meaningful and valid.

A review of the PR19 business plans indicate that water companies have conducted a mix of qualitative and engagement activities to obtain informed priorities. For example, SSC used qualitative activities that consisted of discussion groups and depth interviews to understand customers' priorities for service delivery both at present and over the longer term (uninformed and informed). The initial list of uninformed responses resulting from this research was reprioritised once customers were prompted with the relevant information. Other companies such as Affinity Water and Yorkshire Water obtained informed priorities via online customer community panels using quantitative activities such as online surveys, step boards and quick polls. Some of these activities started off with uninformed views but allowed customers to become informed customers as they moved along the price review process.

In line with UKWIR (2011)[8], the candidate list of service measures to be included in WTP surveys have usually determined by water companies based on the following factors:

- The benefits value has the potential to make a significant difference to companies' investment plans,
- The company believes it will need the benefits value to justify the investment plan to the regulators; or
- The service measure ranks high among customers' priorities, as demonstrated by qualitative research (e.g., surveys, focus groups, customer contacts), so the value of further improvements should be kept up to date.

Water companies utilised multiple valuation methods at PR19 including a variety of stated and revealed preference methods, behavioural experiments, value transfer methods, subjective well-being approaches, gross value-added (GVA) approaches, deliberative valuation workshops and market price studies to obtain customers' valuations for service measures.

[8] UKWIR (2011) Carrying out Willingness to Pay Surveys, Report ref 11-RG-07-22.

Recommendations

In line with our proposal for the present study, we continue to recommend using paper-based pre-tasks to obtain uninformed customers' priorities centred around:

- Customer's household use of water
- Customer's community and the area where they live
- The supply area

The uninformed priorities that will emerge from the pre-tasks can be used to compare with the findings from the SSC Foundation research to understand if and how priorities have changed since PR19.

The uninformed priorities from our study will be subject to extensive discussion with customers via focus groups or extended deliberative workshops. During the deliberative session, we will prompt customers with relevant information in order to elicit informed priorities. We will first conduct a gallery exercise to help tease out the key priorities. The gallery exercise will be followed by a pyramid exercise to understand the hierarchy of the list of priorities i.e. derive the list of high, medium and low priorities. The output from the deliberative workshops will be a list of key informed customers' priorities that will help guide the development of the quantitative tracking survey in Stage 3.

Our recommended approach is consistent with the views expressed in the Blue Marble Research study which notes the following:

"*Where used, deliberative research is received very positively and seen as a long-term investment in understanding at a principle level what consumers want. Foundational deliberative research to debate high-level principles prior to plan development was seen to have served as an excellent platform for all future research activity" (page 29).*

3.5 Measurement of Priorities

Once the candidate list of priorities has been determined by water companies, it is important to use appropriate methods to measure these priorities. There are no best-practice guidelines available from Ofwat, CCW or the Central Government regarding the methods that are most suitable for measurement of customers' priorities. A review of the PR19 research shows that customer priorities have been measured in a variety of ways by water companies. The most common methods used is listed below.

Scoring method

In this case, water companies asked customers to score the priority or importance of a service area/initiative on a scale from 1-10 or 1-5. For example, Affinity Water used scores to measure priorities for its PR19 business plan outcomes. Affinity Water conducted an online survey in its initial phase of customer engagement to obtain quantitative evidence of customers' agreement for the inclusion of each of its four PR19 business outcomes. Accordingly, the survey asked participants to score the importance of the four outcomes

as well as different aspects of each of the four outcomes on a scale from 1-10. Based on the responses, a mean score was calculated for each of the four outcomes as well as their different aspects. These mean scores were then used to derive a priority ordering for the outcomes.

Although the scoring method is easy for participants to answer, these types of questions do not require any trade-off to be made and can result in high scores being attached to all options, which limits the information obtained.

Top 1,2,3 method

In this case, water companies asked which service area/initiatives from a long list, customers would most like to see, next most like to see, etc. For example, SSC used this method to validate findings from its foundation qualitative priorities study. SSC conducted a Customer Priorities online survey which asked customers, uninformed, to choose their top three priorities from three areas: water quality & water supply, customer service & bills and planning for the future and then asked customers to choose their top three priorities from all the options together.

The Top 1,2,3 method is easy for participants to answer and require participants to order the alternatives. On this basis, they are typically more informative than, and hence preferable to the scoring method.

Ranking method

Several water companies, including Affinity Water, Anglian Water, Bristol Water, South West Water, asked customers to put a full list of service area/initiatives into priority order. This method generates priority orderings for their PR19 service areas/ initiatives.

The ranking method is generally easy to answer but can be difficult for customers when there are lots of areas that need to be ranked. However, the ranking method obtains substantially more information about people's preferences than the Top 1,2,3 question and so are to be preferred on that basis.

MaxDiff method

MaxDiff exercises present customers with a sequence of questions asking which of a short list of four or so service areas/initiatives shown they would like to see given highest priority and which they would like to see given lowest priority. The set of service areas shown varies across the sequence of choice scenarios. The responses obtained from a MaxDiff exercise are used to estimate an econometric model of the average impact of each service measure on choices. The final output from the MaxDiff choice exercise is an index that summarises the relative priority given to each service improvement. A number of water companies including SSC, Anglian Water, Welsh Water and United Utilities used this approach at PR19.

Similar to the other ordering methods (i.e. the Top 1,2,3 and the ranking methods), the MaxDiff approach are typically more informative than scoring questions. Comparing

across the ordering methods, we find that the MaxDiff method obtains more information about people's preferences than the Top 1,2,3 method and so are to be preferred on that basis. In comparison with a ranking question, the MaxDiff approach is substantially easier for participants to answer as it requires only a few areas to be considered each time, and also only requires the highest and lowest points to be identified without discrimination between the middle two or three options, which are generally the hardest ones to discriminate between. MaxDiff questions can thus be considered superior to ranking questions whenever there are several attributes that require ordering.

Recommendations

We recommend using the MaxDiff method to track and measure key customers' priorities throughout the AMP7 period.

In comparison to the scoring method, all the three ordering methods have the advantage that they require customers to make trade-offs and thus we obtain similar type of information. Further, a comparison among the ordering methods, indicate that the MaxDiff method provides superior information to all other approaches except a full-ranking question. However, since MaxDiff questions provide the same information content as a full ranking question while being easier to answer, we recommend the former approach.

3.6 Measurement of WTP

WTP is defined in economics as the amount of money consistent with a person, or household, being indifferent between having the good or service improvement in question and making the payment, and not having the good or service improvement but also not having to make the payment. Estimates of WTP are used whenever there is the need to evaluate the social value, or benefits, of a scheme for inclusion in economic appraisals.

Where goods or services are traded in well-functioning markets then WTP is simply equal to the market price. However, where values are needed for improved service levels provided by monopoly utilities, or for public goods more generally, there is no functioning market and so there is a need for non-market valuation methods. Such methods include SP, revealed preference (RP), subjective well-being valuation (WV) and value transfer (VT) techniques. In the following we provide an overview of these approaches and set out their pros and cons at a high level.

Stated Preference Methods

Stated preference (SP) methods involve asking survey participants a series of carefully designed questions to explore their preferences in relation to the object of the study. When used for social valuation, SP methods invariably involve participants having to make a trade-off between having more or less of the good or service in question and having to make, or receive, a higher or lower payment. It is the trade-off between money and the provision of the good or service that defines the value measure.

The most common SP methods include the following:

- **Contingent valuation**
  A question, or series of questions, aimed at obtaining a value estimate for a specific improvement or initiative. Typically, these questions involve a choice of whether to have the improvement in question and agree to a payment such as a bill increase, or not to have the good or service improvement but also not to make the payment.

- **Discrete choice experiments (aka choice-based conjoint)**
  A series of questions asking for the preferred choice from two or more options where each is characterised by a number of attributes (typically 3-6). Econometric analysis of the data allows for valuation of each of the attributes individually.

- **Best-worst scaling (includes MaxDiff)**
  A series of questions asking for the most and least preferred alternative from a set of 4-6 options, or for the most and least important item from a list of 4-6 options. Econometric analysis of the data allows for an importance or priority index of options to be estimated.

- **Contingent ranking**
  Questions asking participants to rank a list of options. Econometric analysis of the data allows for an importance or priority index of options to be estimated.

Of these methods, only the first two typically allow for valuation estimates to be obtained. However, it is possible to combine two or more of these methods within a single survey to good effect. For example, several studies include a contingent valuation exercise to obtain the value of a broad package of improvements, coupled with a discrete choice experiment to derive the relative values of individual attributes. [See, for example, Metcalfe et al. 2012.][9]

Revealed Preference Methods

In contrast to SP methods, RP approaches involve the analysis of behavioural choices made by people in the real world. The most common RP approaches include the following.

- **Averting behaviour**
  This method assumes that expenditures incurred on averting (i.e., defensive) behaviour are indicative of the value avoiding the issue in question. This method is used in the water sector, for example, by investigating purchases of bottled water and other expenditures incurred when there is a water service incident as a means of obtaining a value for avoiding the incident in the first place.

- **Travel cost / site choice**

[9] Metcalfe, P. J., et al. (2012), An assessment of the nonmarket benefits of the Water Framework Directive for households in England and Wales, Water Resour. Res., 48, W03526, doi:10.1029/2010WR009592.

Analysis of which sites people choose to visit in connection with attributes of those sites, including how far away they are, can be a good means of estimating the value of allowing access to a given site and/or the value of key site attributes.

- **Hedonic pricing**
  Variation in house prices can sometimes be used to derive valuations of environmental features such as noise levels or the presence of local amenities. This approach relies on the fact that properties with good local environment features tend to be more highly valued, and hence more highly priced, than other properties all else equal.

These approaches thus have the advantage that they are based on real world behaviour but come with the disadvantage that there are often no real-world situations where choices reveal values for the issues at stake. For example, this may be because the issue in hand is to value an initiative that has not previously been carried out, or it could be because people sometimes value things for reasons that go beyond any behavioural interaction they may have. Such 'non-use' value can be a significant component of the total economic value of an initiative or improvement, but it leaves no behavioural trace and so cannot be valued using RP methods.

Well-being Valuation

A more recent innovation in the field of non-market valuation involves the analysis of subjective well-being data to derive value estimates. Typically, the question used for WV analysis is: "Overall how satisfied are you with your life these days?", with answers recorded on a scale from 1-10. This is a widely asked question, including in national UK government surveys, and there are a number of estimates in the published literature concerning how much each point on this wellbeing index is worth in money terms. Thus, if there are data available to compare a population's wellbeing with and without some service variation then there is a means to derive a monetary measure of that service variation's value to the population.

The use of the WV method has grown in recent years and has recently been included in HM Treasury Green Book official guidance as a suitable method for valuing non-market impacts. The method has the advantage over SP methods, where it can be applied, in that the impacts measured are real impacts on well-being rather than stated choices on a survey.

However, its domain is more limited than in the case of SP research since it cannot value prospective changes that have not previously been experienced anywhere. Furthermore, it cannot reliably value impacts that have only a minor impact on wellbeing. Additionally, as with RP research, WV studies are not experimentally designed and so can suffer from the presence of confounding factors in the analysis beyond that which it is possible to control for in the analysis. Finally, WV studies rely on the assumption that subjective well-being, as defined in these studies, is able to adequately capture everything that people care about. If people care about the environment beyond their local area, for example, then they may be willing to pay for improvements even if those improvements have no measurable impact on their subjective well-being.

Value Transfer / SROI

The final method widely used for monetary social valuation is the value transfer / social return on investment (SROI) technique. This methodology takes value estimates from other sources, including SP, RP, WV or market prices, and translates them to be as applicable as possible to the initiative or improvement being valued. The advantage of this method is that it is often substantially quicker and less costly than undertaking a primary valuation study. However, there will generally be an error introduced when transferring values from one study to another and this may be substantial. Moreover, there may simply be insufficient evidence in important areas of interest to apply this methodology in some cases.

Recommendations

We recommend using a stated preference (SP) methodology as the core technique for measuring WTP for service level changes at PR24, supplemented with additional revealed preference, wellbeing research, further stated preference research, and/or value transfer/SROI analysis to the extent that the research budget allows. Additional studies will provide greater assurance around the ultimate triangulated WTP values used in the PR24 business plan.

The key advantages of the stated preference method, for the purposes of the core valuation research, are the following:

- Anything can be valued. By contrast, other techniques are often highly limited in the range of impacts that can be valued.

- The impacts to be valued can be described precisely and in the correct context. By contrast, value transfer techniques draw on evidence that is typically obtained in a variety of contexts and is thus correspondingly less accurate.

- The methodology is endorsed by UK Government as a robust monetary valuation technique.[10]

Issues with SP arise, amongst other reasons, when descriptions are inaccurate, difficult to understand or ambiguous, where there are incentives for participants to misrepresent their preferences, or where participants treat the survey as inconsequential and do not consider their preferences carefully. All of these issues can be avoided with careful design and testing of the kind that we employ as a matter of course. Nonetheless, it is important to recognise that no research is without error and, as such, it is good practice to measure and appraise the validity of the results, as carried out in this study, rather than simply rely on them in good faith.

We anticipate that the core WTP measurement will be undertaken separately from the priorities tracking research that is the focus of stages 2 and 3 of the present study. This is

[10] HM Treasury (2018) The Green Book: Central Government Guidance on Appraisal and Evaluation

because the WTP research requires the survey to set out the scope of service improvements to be valued, whereas it is anticipated that the present priorities research will focus on high level priority areas.

As at PR19, however, it may be possible to use outputs from the priorities research, in conjunction with other sources of data, within the triangulation exercise to arrive at overall estimates of WTP and the ranges around them. To support this triangulation, and to provide early and regular indications of customers' WTP for service improvement, it may be advantageous to include WTP questions within the priorities research itself. However, this will depend on the nature of the candidate list of priorities and the extent to which a package of service improvement can be defined that is suitable for valuation. We would recommend re-examining this issue once the candidate list of priorities for the present research is established.

3.7 Aggregation of Priorities

A key overarching business planning objective for companies has been to ensure and demonstrate 'customer support' for the plan. This is made complicated by the fact that there is no definitive measure of customer support, and different potential measures can run into conflict with one another.

Considering the business planning process as a whole, the typical stages relevant to ensuring and demonstrating customer support have included:

- Research on customer priorities and valuations
- Cost-benefit analysis to set performance commitments (PC)
- Bill impact modelling
- Acceptability testing of the resulting plan, including its bill impact
- Ofwat's risk-based review, including an 'affordability' score.

There are several objectives to operationalise 'customer support' that are potentially in conflict with one another here. Table 1 presents a list of such measures.

Table 1: Objective Measures of Customer Support

Criterion	Description
CBA / Efficiency	Maximise net benefits to customers (current, and also possibly future), or society at large. – the usual rule applied in cost-benefit analysis.
Acceptability	Maximise 'acceptability score', or proportion with a positive net benefit.
Affordability	Minimising the bill impact, particularly on low income/vulnerable customers; or, maximising the proportion viewing the plan as affordable.
Equity	E.g. prioritise groups with poor current service, or low incomes; balance the interests of current vs future generations of customers; maximise proportion viewing the plan as fair.

These measures may be correlated with one another in several ways. For example, acceptability scores are likely to be higher, particularly on an uninformed basis, if

affordability scores are higher. This is because both are influenced primarily by the bill impact. Additionally, acceptability scores are likely to be correlated with scores for fairness due to the fact that these can sometimes be interpreted as synonyms for one another.

However, there may be important conflicts between CBA / Efficiency and other measures of customer support. For example, adopting the CBA rule will conflict with equity since no account is taken within CBA to prioritise those currently receiving low levels of service, or those with low incomes, or to balance the interests of future vs current generations of customers.

In general, following the CBA rule may also result in levels of acceptability below 50%. This is because WTP tends to be right-skewed, due to the fact that it is generally bounded from below at £0 but unbounded from above. This has the implication that mean WTP tends to be greater than the median, i.e. 50th percentile, so using the mean measure within CBA results in a level of service that would be supported by less than 50% of the customer base. Thus, a water company may reasonably decide that following the CBA rule is not appropriate if the aim is to maximise customer acceptability.

There are also potential conflicts between equity and other objectives. The reasonable desire to achieve an equitable treatment of customers, including balancing the interests of current and future customers, may lead to decisions that may legitimately over-ride a pure cost-benefit calculation, particularly if customers can be shown to support the decisions taken at the level of the principle as opposed to solely at the level of the personal preferences over service levels and bills. Given that the notion of acceptability captures fairness concerns as well as personal net benefit concerns, the testing of principled decisions based on equity concerns may be a necessary/desirable feature of the business planning process to introduce alongside customer value measurement in order to achieve high acceptability scores when tested.

The optimal plan will, in general, depend on how important the various measures are considered to be in relation to one another. Attaching some weight to equity, affordability and acceptability measures will result in a plan that departs, potentially significantly, from that derived purely via a cost-benefit rule.

The optimal research strategy, including sample design and analysis methodology, will also depend on how important the measures are in relation to one another. For example, if a high priority is to be given to the affordability of the plan, then analysis of customer values should focus on the values of the low income/vulnerable groups, and focus should be given to how bills can be kept as low as possible for those with affordability concerns. This implies that an optimal sampling strategy for both WTP research and acceptability research would include a bias towards low income/ vulnerable groups. That is, a higher proportion of these types of customer should be included in the sample than there are in the population.

Recommendations

Taking account of customers' priorities in decision making requires choosing some way of aggregating them. Although in many cases, one might take a majority, or average, viewpoint as the 'voice of the customer', a monopoly water company may sometimes choose to take a different line, for example giving greater weight to vulnerable customers, or considering future customers rather than just current customers as having standing, when choosing service levels or priority areas. Customers themselves should ideally be engaged on how they would like to see the company balance these objectives. Such engagement would provide legitimacy to its adopted strategy.

We recommend considering issues related to aggregation, and its equity implications, in order that the strategy moving forward is clear-sighted with respect to how our results might be used in decision making. This will have important implications on the research approaches taken, for example in deciding where to focus sample designs.

3.8 Triangulation of Priorities

With regard to the establishment of customer priorities (and WTP), evidence is available from external sources as well as from a company's own customers. Although evidence from own customers is, all else equal, to be preferred to evidence from elsewhere, there are good reasons for incorporating external evidence in order to better measure customers' own priorities (and WTP). By so doing, companies can generate new perspectives and insights to help better understand their customers' priorities and preferences.[11] This process of triangulation is seen as a good practice to follow as part of business planning for all decisions where evidence on customers' preferences is relied upon to justify important decisions.

Ofwat's customer engagement policy statement for the 2019 price review included the guideline that companies should draw evidence from a wider range of customer research sources (internal and external) and, in addition, operational data including contacts and complaints, to supplement their stated preference WTP survey results.

Despite calling for triangulation, Ofwat has not itself provided any detailed guidelines for companies to follow. Instead, the key reference point for triangulation is a report commissioned by CCW, ICF (2017) *Defining and applying 'triangulation' in the water sector*, which sets out a suggested triangulation framework for PR19. The suggested triangulation framework consists of seven steps as listed below:

- Specify high level research objectives and existing hypotheses/questions
- Identify possible data sources and research methods
- Identify key findings from analysis of each evidence source
- Weigh-up evidence, compare and contrast findings
- Assess existing and new hypotheses
- Communicate and test findings and

[11] Ofwat (2016), p.14-16.

- Coordinate with business planning

Thus, the ICF framework covers the span of activities from strategic planning of research priorities through to concluding and feeding into business planning. However, its suggested triangulation framework does not provide any guidance on how to combine evidence from multiple sources in such a way as to arrive at a set of numbers based on the evidence as a whole. The focus was instead on the use of multiple sources of evidence to challenge pre-specified hypotheses and potentially generate new hypotheses.

In March 2017, Frontier Economics in a report for Ofwat, recommended three options that could be used to combine the different customer data sources. Following Frontier Economics (2017), these options are presented as follows:

- mechanistic rule: using either simple averages or weighted averages of the different values, with weights defined in advance
- systematic judgement: using reasoned judgement based on a pre-defined criterion – for example, treating revealed preference as a lower bound value for supply interruptions because it does not account for the 'inconvenience' associated with such interruptions.
- multi-input CBA: testing how sensitive CBA is to different customer valuations- for example, using a range of evidence on customer valuations to generate upper and lower bound WTP estimates and developing PC ranges based on these different levels.

A review of PR19 business plans suggests that water companies used a qualitative and/or a quantitative approach to triangulation.

Customers' priorities obtained from engagement activities were used for triangulation in one of the following ways:

- combined directly with core WTP measures in a qualitative framework to produce a list of triangulated priorities
- used to cross check and validate triangulated WTP results
- used to make a number of adjustments to the core WTP values and combined to derive their "triangulated" values.

Examples of water companies that used a qualitative framework to derive triangulated priorities include Anglian Water, Thames Water SES Water, Portsmouth Water. The triangulation process involved taking each source of customer evidence, extracting the relevant views and preferences and then creating a synthesis of customer insights around business plan outcomes.

Examples of water companies that used customers' priorities to cross check and validate their triangulated WTP measures include South West Water and Thames Water. The triangulation process involved bringing together outputs from their customers' valuation studies to produce triangulated WTP values which were then validated against priorities generated from a wider customer evidence base comprising of customer contacts data and qualitative customer research studies.

Examples of water companies that used customers' priorities to make adjustments to their core WTP values to derive their "triangulated" values include Anglian Water, SSC, United Utilities, Wessex Water, Yorkshire Water, Severn Trent Water and South East Water.

SSC, Anglian Water and United Utilities combined customers' priorities with WTP measures by assigning weights to all the different customer evidence sources based on theoretical and statistical validity criteria and then taking the weighted average of these values to derive triangulated WTP values for use in cost-benefit analysis.

Wessex Water and Yorkshire Water combined customers' priorities with WTP measures by adjusting weights assigned to triangulated WTP values. As an example, the triangulation process of Wessex Water consisted of assigning weights to each of the valuation studies based on a number of criteria including cognitive validity, choice architecture, completeness and statistical significance. Next, these weights were adjusted to take account for other study characteristics such as the age of the research. Additional adjustments were made to the weights based on evidence emerging from qualitative customer research studies and finally the results were combined to produce triangulated customer valuations. The details of how adjustments were made based on the qualitative evidence is not provided in the publicly available reports.

Severn Trent Water and South East Water used their own judgement to combine customers' priorities with WTP measures. The triangulation process involved utilising customer valuation studies in a triangulation framework to generate triangulated WTP values for customers. Next, the valuation studies were critically assessed against a number of criteria such as statistical validity, cognitive validity, research approach etc. and assigned weights accordingly. Further, the triangulated valuation results were cross-checked against customer contacts data and the qualitative customer research data and decisions were made based on sound judgement by internal experts on how to combine the results in order to generate WTP values for use in cost-benefit analysis.

Overall, triangulation serves a useful purpose in improving the customer evidence base that is crucial for effective decision-making. However, there are some challenges associated with triangulation, the most important being the complex nature of the approach and its sensitivity to analyst judgements. Further, there is a lack of detailed guidance for water companies on how to approach triangulation.

We recommend using a qualitative framework to derive triangulated customers' priorities. The uninformed and informed priorities that will emerge from our study can be combined with all other SSC customer insight sources to yield triangulated priorities.

Two issues that warrant mention in this regard are:

- SSC should focus on obtaining and maintaining an updated record of its BAU activities This is because these data sources convey important information regarding customers' needs and requirements which can be combined with the output of our study within a triangulation framework.

As the Blue Marble study notes:

"….. water companies should be using their BAU research and insight to determine current consumer priorities by listening to their needs. This is particularly important for vulnerable, future and NHH customers who are either less able or less willing to engage with business planning research processes"

- SSC can set up an interactive digital platform like the Customer Insight Hub set up by United Utilities (see Figure 16) which can collate customer contacts data and outputs from bespoke customer research projects in one structured location. This tool should prove to be effective in accessing, analysing and triangulating customer insights for long-term business planning. Further, this tool could also prove useful if water companies decide to participate and share data on a water sector-wide digital platform, as recommended by Ofwat in its recent "Time to Act, together" strategy paper.

4 Conclusions and Recommendations

The present report represents the first stage of a three-stage study comprising desk research, qualitative research, and quantitative research. The overall objective for this desk research stage was to lay the groundwork for the remaining two stages of the study. This report achieves this objective by synthesising baseline SSC customer priorities, as currently understood, and discussing issues relevant to the measurement and application of priorities looking forward.

Our review and synthesis of SSC customer priorities data revealed a considerable degree of consistency in customers' priorities which enabled us to derive a list of core priorities or "hygiene factors" that customers wanted SSC to deliver on. In addition, some other important priorities also emerged as future "hygiene factors". However, some variation in priorities was identified across the different segments of its customer base.

Having identified baseline priorities for SSC, we presented a detailed discussion of some of the key issues pertinent to the tracking of SSC customers' priorities during AMP7. These included requirements for priorities measurement; types of priorities; developing candidate lists of priority areas; aggregation of priorities and triangulation of priorities. Our discussion was primarily based on lessons learned from the PR19 customer engagement work undertaken by water companies.

Based on our discussion, we make the following recommendations to SSC for the remaining two stages of the study:

- To use deliberative research methods in order to elicit uninformed and informed priorities regarding SSC's wholesale and retail services, both in the short and long term
- To use the MaxDiff method in order to measure such priorities. The results of the MaxDiff exercise would be used to derive a population-weighted index of priority for the key service measures/ initiatives
- To consider aggregation and equity issues which is likely to have implications for optimal sampling
- To utilise a qualitative triangulation approach that will combine priorities emerging from our study with all other SSC customer insight sources to yield robust triangulated priorities.

In summary, the findings of this study provide an up-to-date view of SSC customer priorities and valuable insights into understanding and measurement of customers' priorities and we recommend them to SSC for this purpose.

Appendix A

Review of PR19 Evidence

South Staffs and Cambridge Water

The main customer engagement activities that contributed to the identification of SSC customers' priorities for PR19 were:

- Foundation Priorities research
- Customer Priorities survey
- WRMP core research

Foundation Priorities Research

The Foundation priorities research program was conducted in June 2017 by Accent, on behalf of SSC to understand household and business customers' priorities for service delivery both at present and over the longer term (uninformed and informed). The research program was based on a purely qualitative methodology and consisted of pre-tasked extended discussion groups, home interviews with customers in vulnerable circumstances and telephone depth interviews with larger non-household customers. 96 customers took part.

The research revealed the following key uninformed priorities that were found to be consistent across all customer groups i.e. household and non-household customers including hard-to-reach and future bill-payers:

- quality of water
- continuity of supply
- customer service
- fair and accurate billing
- investment to maintain and improve infrastructure and
- reducing leakage-especially among older household and larger business customers

The above priorities which were identified as key priorities in the SSC PR14 research were now identified as "hygiene factors" that customers wanted SSC to deliver on. The research also revealed that customers were now expecting SSC to deliver on some additional key priorities which were not mentioned in their PR14 research and which included:

- investment in innovation, covering education (i.e. information and advice to help them have more control of their water usage e.g. providing smart meters); built-in water recycling systems (for new builds/refurbishments and other rainwater harvesting solutions to reduce demand) and infrastructure and operations (such as more resilient materials for pipes and use of alternative energy sources to power the network)
- addressing environmental factors and the impact of climate change.

Once customers were prompted with relevant information, there appeared to be a shift in some of the priorities with the following moving up the list:

- planning for population growth
- assisting vulnerable customers
- managing the impact of climate change
- protecting and enhancing the natural environment
- managing the impact of increasing energy costs
- ensuring financial stability and
- ensuring affordability of bills v ensuring long-term resilience of assets to meet future demand.

However, the core “hygiene factors” remained at the top of the list of priorities for the majority of the customers.

Customer Priorities Research

In order to quantify findings from the Foundation priorities study, SSC conducted an online Customer Priorities survey. The survey respondents were recruited via a pop-up link to the online survey on the SSW and CAM website home pages. The survey which ran from early December 2017 to the end of January 2018 was completed by 291 SSW customers and 166 CAM customers completed the full survey.

The survey asked customers to choose their top three priorities from three areas: water quality & water supply, customer service & bills and planning for the future. Customers were then asked to choose their top three priorities overall. To mirror the Foundation research, customers viewed the options in the survey with no context setting (e.g. how much each option might cost) and no comparative data provided (e.g. how SSC is performing relative to other water companies).

In order to provide a robust priority ordering, SSC used an econometric model (rank ordered logit) to derive a priorities scale based on all the three statement choices.

The research revealed the following key priorities:

Table 2: Priority order index by region from the Customer Priorities Research

Options	SSW Priorities scale	CAM Priorities scale
Providing a high-quality water supply that is always safe to drink	26%	24%
Making sure water always comes out of the tap - i.e. no supply interruptions	6%	8%
Offering fair and accurate billing	6%	8%
Reducing the amount of water that leaks from our pipes	6%	7%
Having plans in place to ensure we have enough water for a growing population	6%	6%
Ensuring the water always tastes and smells good	6%	4%
Making sure we fix all leaks as quickly as possible	6%	7%
Making sure we balance offering affordable bills against the need to invest in our network for the long-term	5%	3%
Installing systems that capture rainwater and non-toxic used water for use in flushing toilets and the garden	4%	5%
Making sure the water is never discoloured / cloudy / has particles in it	4%	2%
Offering great customer service	3%	3%
Investing in new technology and ways of working that help customers better control their water usage: such as smart meters & apps	3%	2%
Managing the impact of climate change – such as increased heavy rainfall leading to flooding, burst pipes due to extreme temperatures	3%	5%
Protecting and improving the natural environment for wildlife and plants	3%	3%
Assisting more customers who need extra support the most: financial and/or special services	3%	1%
Educating customers on how to use water more responsibly (and save money)	2%	2%

Source: SSC Appendix A2: Identifying customer priorities. Note: Only the top 16 priorities are included in the above table

Core WRMP Research

In July and August 2017 SSW commissioned a comprehensive programme of qualitative and quantitative engagement with a broad range of its customers and stakeholders, the findings of which were to be used to inform the WRMP and business plan. The research consisted of three elements in both South Staffs Water (SSW) and Cambridge Water (CAM):

- Two phase deliberative workshops (SSW/CAM) with household, non-household SME's and future customers – 62 customers in total
- Roundtables with stakeholders and large business customers – 21 in total across both regions.
- An online survey with 512 household customers across both regions.

Each of the demand management and supply-side options presented to the participants in both the WRMP workshops and the online survey, used verbal and/or visual scales to provide them with a feel for the relative service measures of each option in terms of volume, cost, environmental impact and future proofing.

At the WRMP workshops, participants saw, discussed and stated their priorities for the various demand management and supply-side options presented to them on 'Top Trumps' cards. Customers expressed their priorities at the start and end of the sessions using interactive keypad voting technology. Customers' priorities expressed in the workshops were measured using three measures:

- Overall score = a qualitative measure based on all feedback (1 = very positive, 2 = positive, 3 = neutral / polarising, 4 = negative, 5 = very negative);
- Votes allocated = the number of overall votes an option received (participants had six votes each to spread out as they saw fit) and
- Least preferred = the number of people who chose this as the option they liked least (participants could vote for one option only).

The top three priorities revealed at the start of the workshop were:

- ensuring water quality;
- keeping bills affordable; and
- reducing leakage.

At the end of the workshop, once customers were provided with relevant information, their priorities were reassessed. In both the SSW and CAM regions, this led to an increased importance being placed on the following two measures:

- encouraging people to use less water and
- installing more meters

The list provided to customers in the workshops did not include reliability of supply. However, when asked about this service measure, customers in the WRMP groups identified it as a key priority area.

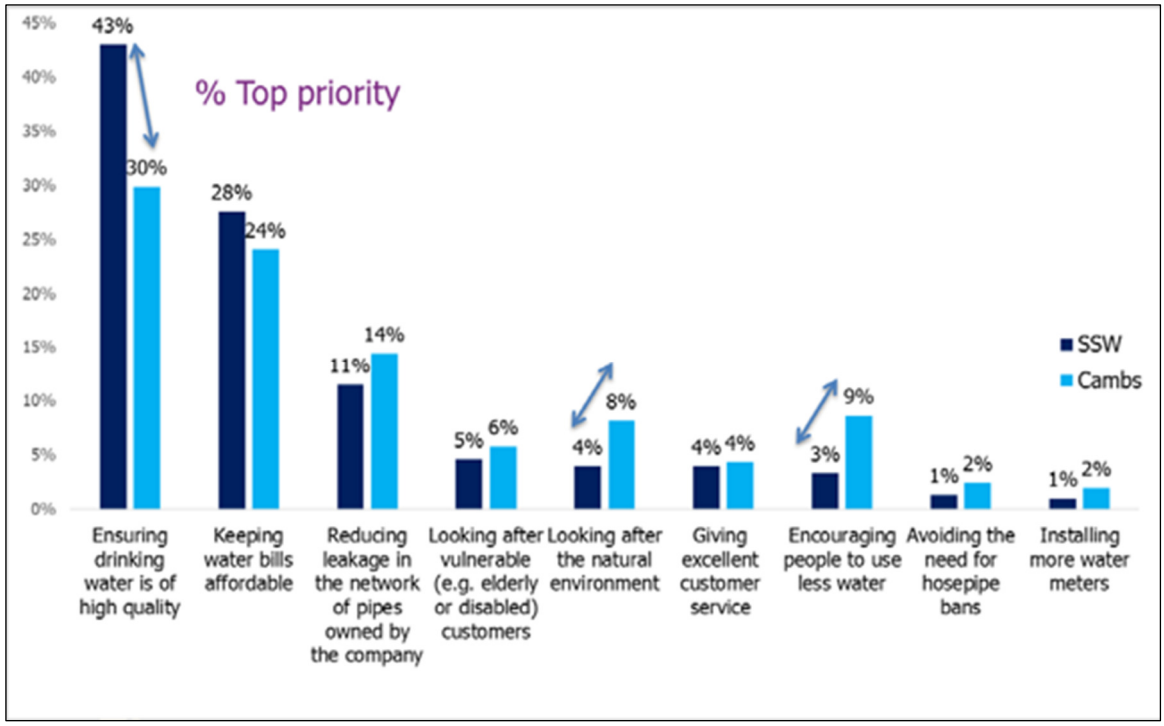
The key unprompted priorities that emerged from the roundtable events with stakeholders and large business customers, were largely similar to other customers. However, these priorities were based on a more informed position and concerned planning for the future and ensuring resilience of water supply.

In the follow-up WRMP online survey, participants stated their priorities amongst the various demand management and supply-side options presented to them within the survey. This list of options was similar to the list presented to workshop participants. The participants were asked to what extent they were for or against each option from +2 = 'strongly for'; -2 = 'strongly against' and 0= neutral midpoint. Customers' priorities expressed in the online survey were measured using four measures:

- Mean score = an average figure considering all responses to the question on the extent they were for or against each option
- Proportion for = the proportion of people for an option
- Most preferred = the proportion of people choosing an option that they liked best overall and
- Least preferred = the proportion of people choosing an option they liked least overall.

The top priorities that emerged from the WRMP online survey are shown in Figure 1 below. These priorities were broadly consistent across all customer groups. However, hard-to reach customers were found to place a higher importance on looking after vulnerable people and customers aged above 60 years were more likely to choose leakage reduction in their top three priorities.

Figure 1: Customers' top priorities in our WRMP on-line survey, by supply region.



Source: SSC Appendix A2: Identifying customer priorities

Customers' priorities resulting from the Foundation research, Customer Priorities survey and the WRMP research were used to choose attributes for the WTP research.

Core WTP Research

The core WTP research studies that contributed to the valuation of the SSC customers' service priorities are:

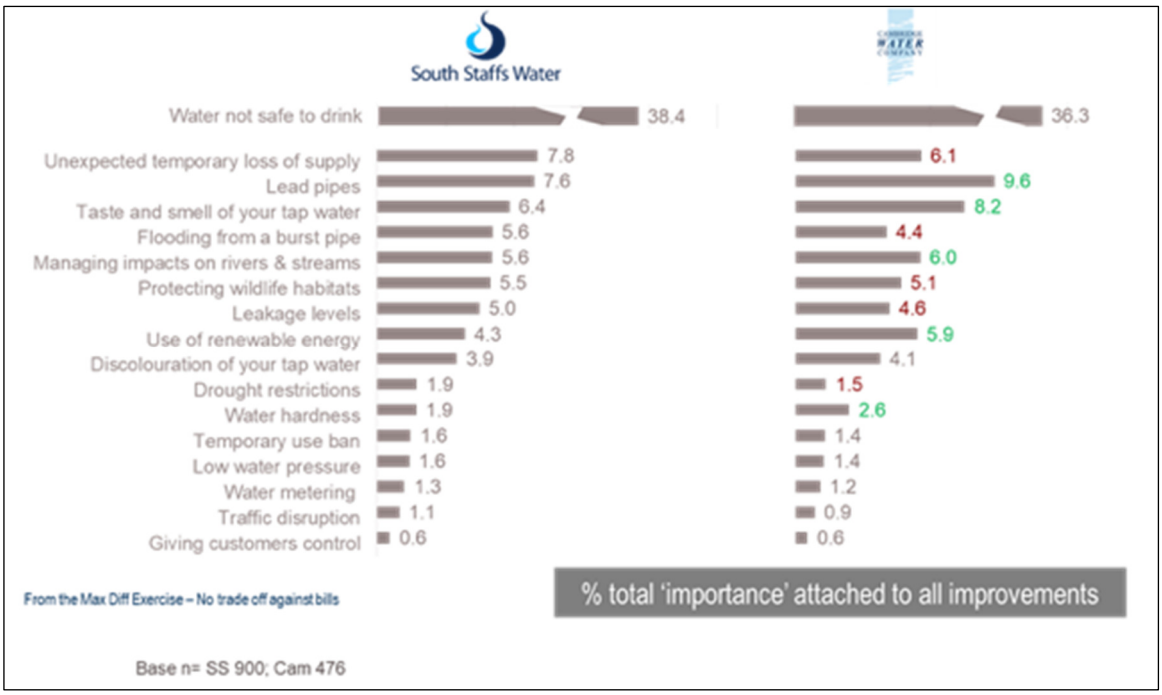
- Wave 1 WTP research and
- Wave 2 WTP research

SSC conducted WTP research which primarily consisted of two large quantitative surveys (Wave 1 and Wave 2) in order to study customers' willingness and ability to pay for different service and investment levels for water services. The Wave 1 survey included a discrete choice experiment and a MaxDiff choice exercise to assess customers' willingness to pay for significant service improvements across various service measures. Unlike the discrete choice experiment, there was no mention of bill amounts in the MaxDiff choice exercise so it was said to be ambiguous whether costs were, or were not, considered by customers when choosing their priorities amongst options.

In the main stage of the survey, there were 1,573 interviews that were conducted in October and November 2017. These interviews were combined with the surveys from the pilot survey. This resulted in 1,999 interviews overall with 1,309 surveys completed in South Staffs, and 690 completed in Cambridge. A total of 333 NHH interviews were completed across the two regions.

The results of the MaxDiff choice exercise for household customers revealed the priority indices for the 17 attributes presented to participants, shown in Figure 2 below.

Figure 2: SSC MaxDiff exercise: Household customer priority index

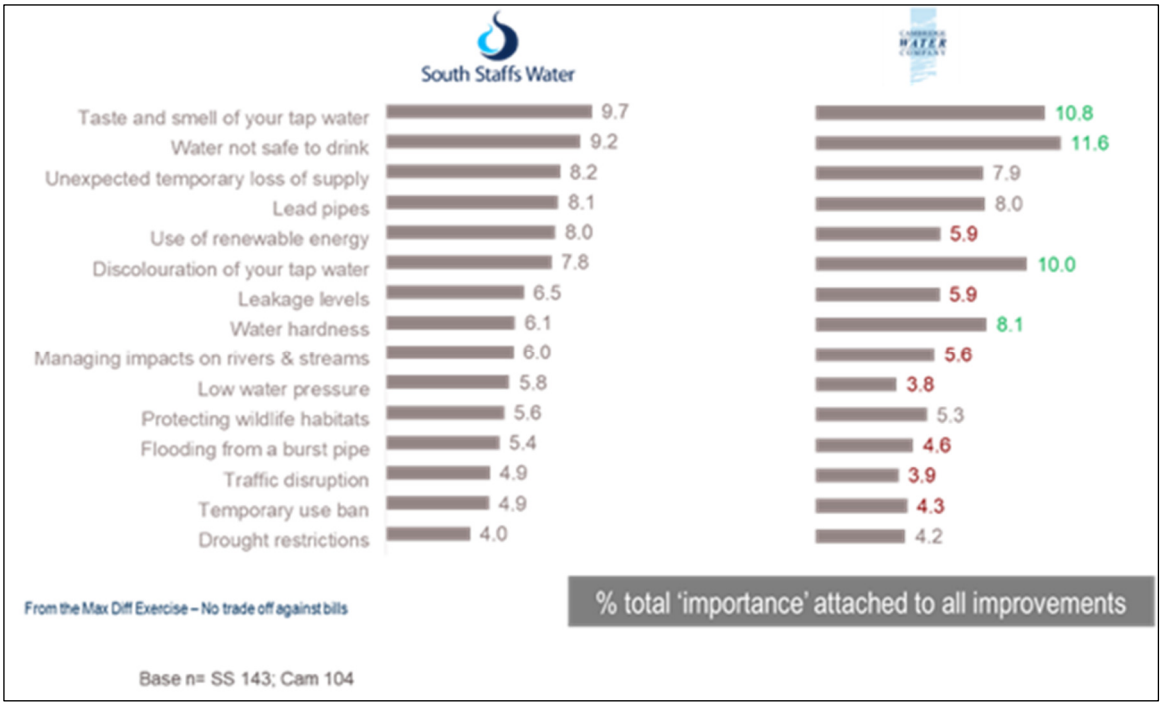


Source: SSC Appendix A2: Identifying customer priorities. Note: Significant differences between our two supply regions are highlighted in green and red.

The above figure shows that, for household customers, the highest priorities were, in general, related to water quality and reliability of water supply. For example, 'Water not safe to drink' emerged as the top priority for customers in both regions. This was followed by 'Unexpected loss of water supply', 'Taste and smell of your tap water' and 'Lead pipes'.

The results of the MaxDiff choice exercise for non-household customers revealed the priority indices for the attributes presented to participants, shown in Figure 3 below. As shown, the top priorities for non-household customers included 'Taste and smell of your tap water', 'Water not safe to drink', 'Discolouration of your tap water', 'Water hardness', 'Unexpected temporary loss of supply' and 'Lead pipes'.

Figure 3: SSC MaxDiff exercise: Business customer priority index



Source: SSC Appendix A2: Identifying customer priorities. Note: Significant differences between our two supply regions are highlighted in green and red.

The Wave 2 survey, which included a discrete choice experiment, was a 'follow-up' customer valuation study carried out to further explore results for specific attributes and refine the scope of attributes included. In Wave 2, the levels of improvements displayed to respondents were amended, and new attributes relating to retail/community included (i.e. investing in community projects, educating future generations and supporting customers facing difficult situations). 982 interviews were conducted in April and May 2018 across South Staffordshire and Cambridge. These interviews included 142 pilot interviews where the new attribute wording and new community attributes were tested. A lower-bill WTP exercise was completed with 290 customers across the two regions while 692 saw the standard WTP version. 719 surveys were completed in South Staffs, and 263 in Cambridge. A total of 244 non-household interviews were completed across the two regions.

Performance Commitment Service Sliders

A performance commitment 'slider' study was conducted by Explain Research in 2018. This research, which was conducted online, surveyed 559 and 225 customers from SSW and CAM regions respectively.

The questionnaire asked customers to move sliders up and down for each of 11 attributes as a means of choosing their preferred service level. The impact on their bill was calculated and shown dynamically. The customers could see the levels for each performance commitment which drove the sliders, for example, they could see the bill impact if they wanted, say, an additional 50 hectares of land to be managed by SSC in order to protect and improve areas for wildlife and plants in the places where they operate. This task was designed to help SSC evaluate the extent that customers want to

achieve for these 11 performance commitments and help them understand how much customers would like SSC to spend for each of these performance commitments to deliver the service that they want. The main output from this survey comprised the service levels chosen by the respondents and their associated bill amounts.

This data source was subsequently combined with the core WTP measures within a quantitative triangulation framework. Individual WTP values were derived as the ratio of the difference between the bill amount chosen and the lowest bill amount and the difference between the highest and the lowest service levels. In obtaining this measure, it was assumed that an individual's WTP was equal to the bill amount at the service level that they chose in the survey and equal to zero for all service levels above the chosen service level. This represents a lower bound assumption.

In addition to conducting specific research into identification and measurement of customers' priorities and values, SSC utilised various supplementary data sources to identify and validate customers' priorities. These included the following data sources:

- Daily customer contacts and complaints data
- Customer satisfaction tracker data
- Bright and SIM surveys
- SSC Web surveys
- SSC Customer Tracking Research
- H2Online Customer community priorities

SSC Contacts and Complaints

SSC collated data on the number of unwanted contacts from customers pertaining to a number of service areas. An analysis carried out by SSC of the number of unwanted contacts per affected household properties over the 3-year period i.e. April 2017-Feb 2018, Feb YTD 2016/17 and Feb YTD 2015/16) revealed the following top priorities:

- unexpected temporary loss of water supply
- discoloured water
- bad tasting or smelling water and
- low water pressure.

In addition, a large number of contacts related to billing queries also highlighted the importance of fair and accurate bills.

Unwanted customer contacts were subsequently combined with the core WTP measures within a triangulation framework. Unwanted customer contacts were considered to be a potentially valid source for WTP triangulation on the basis that it seemed reasonable to suppose that customers were more likely to contact SSC, having experienced a service issue of some kind, if the service issue affected them substantially than if it had only a very minor impact on them. Generalising this intuition resulted in considering as a candidate measure for triangulation the number of unwanted contacts about each type of service issue as a proportion of the number of customers affected that service issue.

Like unwanted contacts, household customer complaints also provided a measure for triangulating customers' priorities. SSC household complaints for 2018/2019 were related to the following areas:

- billing
- metering
- training and soft skills – mainly linked to customer service expectations around how customers want to be treated
- water supply issue – mainly linked to no water and low-pressure following works
- rehab – mainly linked to workmanship and shutting of water supply and
- leakage

SSC Customer Satisfaction

SSC also collated information on customer satisfaction data. The main sources of such data were:

- Customer service tracker data
- SIM and Bright surveys and
- SSC web surveys

Customer service tracker research was conducted to establish customer perceptions of SSC service performance. This research comprised of a quantitative telephone study conducted in 2017-2018 covering 302 SSW customers and 100 CAM customers. The main output from this study was service perceptions and brand service measure ratings assigned by the customers.

Accent conducted a regression analysis using the Customer service tracker research output to identify the drivers of overall satisfaction. This research estimated several regression models to study the impact of satisfaction with water supply aspects and value for money on overall satisfaction and the impact of service failures on overall satisfaction. These models were estimated separately for the SSW and CAM regions to explore regional variations in customer perceptions.

The regression analysis revealed the following areas to be of importance to customers:

- safe drinking water (SSW region)
- a reliable water supply;
- water that is not discoloured and in the South Staffs region tastes/smells bad
- fixing visible leaks quickly and
- offering a value for money service – this is often found to be driven by the price customers pay for their service against the quality and reliability of the water supplied through their taps.

The Service Incentive Mechanism (SIM) survey was introduced by Ofwat in 2010 to encourage water companies to improve their customer service. The overall objective of the study was to measure customer satisfaction at the key interaction points i.e. billing and operations. The research explored the reasons for consumers making a contact with their water supplier and assessed how satisfied consumers were with their water company's overall handling of their contact.

The main output from this research included mean customer satisfaction scores (ranging from 1 to 5 where 5 = very satisfied and 1= very dissatisfied) for all water companies based on the survey results.

A 'Bright' survey also gathered customer data through various channels e.g. email, phone, web etc. and assigned scores to companies based on their handling of customer contacts.

A pop-up web surveys was run on both SSW and CAM websites between June and August 2017 to assess customer perceptions of SSC service performance. This survey asked similar questions to those in the Customer service tracker. A total of 4,658 customer completed the survey of which 3,699 were SSW customers and 959 were CAM customers. The main output from this survey comprised responses to qualitative questions as well as mean satisfaction scores (1-5) regarding the performance of SSC related to various service measures.

Like unwanted contacts, customer satisfaction data sources were combined with the core WTP measures within a triangulation framework. However, only the customer tracker data was included in the quantitative triangulation process since the information contained in the SIM and Bright surveys and the SSC web survey was not sufficient to translate these into measures comparable to WTP.

Given that satisfaction scores do not themselves necessarily correlate with WTP for improvement (since WTP is a measure associated with a change rather than a static state), the satisfaction scores were translated to a comparable unit by using the results of a regression analysis which examined how the impact of a service failure affected overall satisfaction. The principle adopted in using this as a measure of WTP was that a WTP index for one fewer service failure in the future of each type of service failure should be proportional to the relative impact of each type of service failure on satisfaction. This measure was similar in nature to the measure based on customer contacts: in the case of unwanted contacts, welfare impacts were taken to be proportional to the relative propensity to contact the company in response to a service issue; in the case of customer satisfaction, welfare impacts were taken to be proportional to the relative impact on overall satisfaction.

SSC Customer Tracking Research

SSC conducted Customer Tracking Research through a mix of telephone and online interviews across a representative sample of its household and non-household customers. This research was aimed at monitoring customer satisfaction against three key metrics i.e. overall service satisfaction, value for money and affordability and brand perception and trust. The study used Shapley regression models to derive the relative importance of a range of features (e.g. reliability of water supply, colour and appearance of tap water, speed of leak repairs) in impacting overall satisfaction, value for money satisfaction and trust scores. These derived importance measures were used to assess customers' priorities and were included within the quantitative triangulation process.

The research revealed the the following areas to be of importance to customers in the most recent period i.e. 2019/2020:

- offering a value for money service
- reliability of supply
- safe drinking water and
- leak repairs

SSC Retail Operational Plan

The most important priority that emerged from SSC's engagement with customers in the new connection market (such as developers and self-lay providers and NAVs) and with business retailers, conducted in July 2018, was offering great customer service. Specifically, this included the following priorities:

- ongoing regular and ad hoc communication is vital to keep them updated;
- having a known contact that can be reached quickly; and
- having effective processes that allow efficient administration to avoided wasted time and cost.

SSC conducted point of contact surveys with its household customers in Summer 2018 and analysed the survey results via a correlation analysis. The results showed that the key drivers of overall satisfaction related to customer services were:

- first contact resolution e.g. whether issue has been resolved?
- customer effort e.g. how easy was it to resolve the query?
- knowledge e.g. how knowledgeable was the customer representative?
- professionalism - e.g. how courteous and professional was the representative?

Other Research

SSC also conducted engagement activities that were designed to elicit the views and priorities of specific customer groups For example, customer forums and workshop sessions with school students were undertaken to understand their views and preferences regarding services; a deep dive study was carried out to understand the priorities and service expectations of hard-to-reach customers and a metering study was conducted to understand customers' reasons for not switching to a meter. Since data from these engagement activities were subject to caveats they were used only as a potential indicator of customers' priorities.

PR19 Triangulation

The output from the PR19 customer engagement activities were brought together in a quantitative triangulation framework covering the following two areas:

- WRMP priorities: Developing a robust customer priority index, by region, with respect to water resources management plan (WRMP) supply and demand supply options. This index was to be used to fully reflect customers' preferences within SSC's Multi Criteria Analysis investment tool.

- WTP: Developing a robust and proportionate evidence base on customers' WTP for different areas of investment. The triangulated values were to be used within SSC's investment optimisation tool to undertake Cost Benefit Analysis of investment options and as part of the process of setting PC levels, and for setting ODI rates.

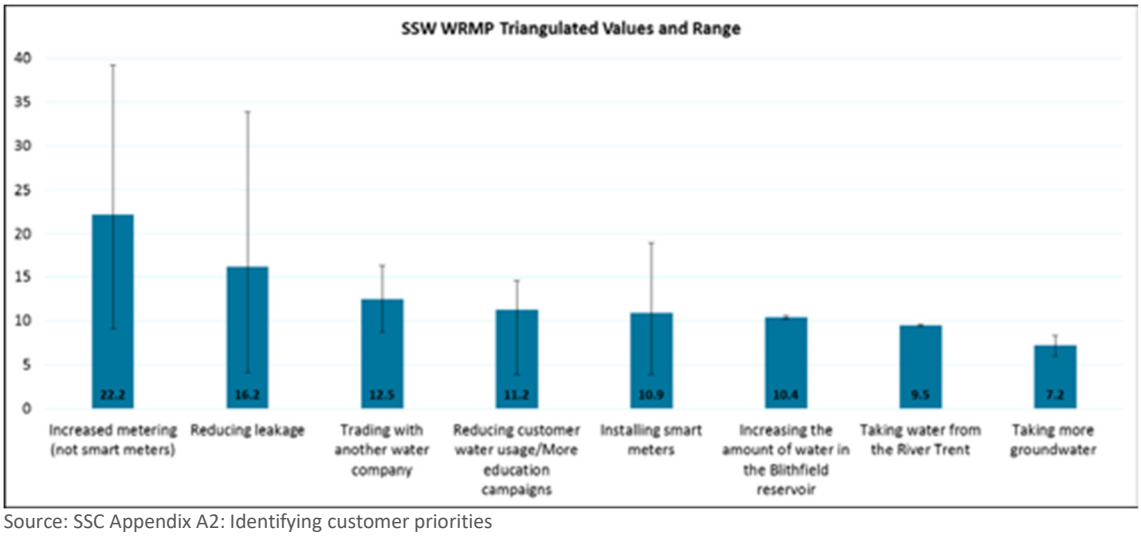
The triangulation work was carried out by Accent and PJM economics. It built upon and extended the ICF (2017) framework[12] to develop an innovative triangulation methodology (known as SMARTS) that involved the following six steps.

- *Screen*: data sources to identify those with potentially comparable measures
- *Map*: non-core evidence to core measures where possible to enable comparison
- *Assess*: theoretical and statistical validity of the resulting measures
- *Rate*: measures as Red/Amber/Green (RAG) depending on how well they perform with respect to the validity measures
- *Triangulate*: to conclude on the values to take forward based on applying RAG weights to obtain central values and ranges.
- *Sensitivity test*: the results based on amending the weights to conform with alternative reasonable perspectives.

With respect to WRMP priorities, several studies conducted by SSC contained evidence suitable for triangulation. This included qualitative and quantitative 'core' WRMP priorities research, quantitative WTP research, and a quantitative 'Customer Priorities' research study.

Figure 4 and Figure 5 below shows the final WRMP priority values for SSW and CAM respectively, which have been re-scaled to sum to 100 and their associated ranges.

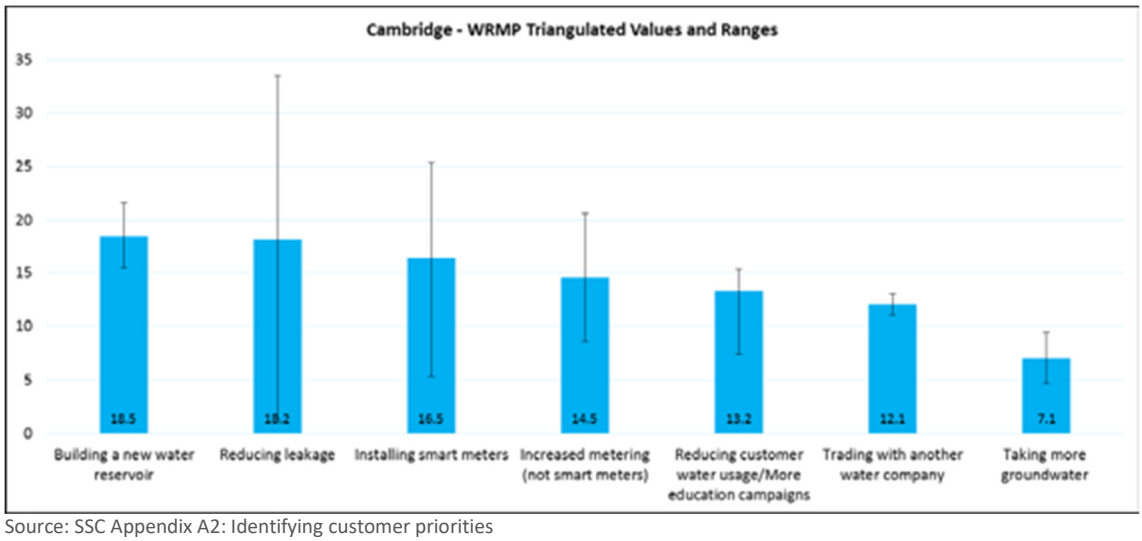
Figure 4: SSW WRMP Priorities



Source: SSC Appendix A2: Identifying customer priorities

[12] ICF (2017) Defining and applying triangulation in the water sector, Report for CCW, July 2017.

Figure 5: CAM WRMP Priorities



Source: SSC Appendix A2: Identifying customer priorities

Some customer studies could not be included within the triangulation process either due to an absence of comparable measures or because these studies were conducted post publication of the final PR19 business plan. Examples of the former type include the Bright and SIM surveys, SSC Web surveys, Metering study etc. while examples of the latter type include SSC's Customer Tracking Research and the H2Online Customer community priorities research.

The novelty of the SMARTS approach was that it utilised and mapped supplementary non-valuation data sources to validate WTP values for service improvements and used that evidence to adjust the core WRMP priorities/WTP values in order to derive their "triangulated" values for incorporation in business plans. The triangulated values derived using this approach, led to robust estimates of the true priorities/WTP values that could be utilised to reflect customers' preferences within water companies' Multi Criteria Analysis investment tool and used within their CBA approach as part of the process of setting PC levels, and for setting ODI rates.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade B** (i.e. overall high-quality plan that meets stretching expectations) to SSC in the area of 'Engaging with customers". Ofwat highlighted the following points in its evaluation:

- SSC conducted an extensive customer engagement programme that involved a wide range of qualitative and quantitative techniques, both on triangulation and segmentation
- SSC's customer research covered different customer segments including hard to reach customers and those with a range of vulnerabilities.
- There is insufficient evidence of the use of customer engagement findings for setting ODI rates. This was reflected in poor scoring in the quality and use of customer engagement to adequately inform its business plan.

- SSC provided evidence of adopting the four FACE areas of action set out in Ofwat's Tapped In report

Post PR19: H2Online Customer community priorities

Since PR19, SSC has set up an online community known as 'H2Online Community' in order to engage in a two-way dialogue with its customers to help shape the company's PR24 business plan and raise awareness of the SSC brand. The H2Online trial covered the period from mid-November 2019 to end of March 2020. Customers were encouraged to discuss issues that were important to them and provide feedback on service issues.

Some of the main areas of member-led discussions included the following areas:

- Billing issues and frequency / charges
- Water meters – location and lack of reads
- Perceived high cost of water
- Water quality - SSW
- Water hardness – CAM
- Low water pressure issues
- Water saving / consumption thoughts
- LT concerns about supply/demand (CAM)
- Leakage levels / speed of fixing leaks
- Using green energy to pump water
- Rehab work issues
- Satisfaction with supply reliability
- Poor customer service experience
- COVID-19

These areas that drove the most member traffic on H2Online are indicative of customers' priorities.

Affinity Water

Affinity Water conducted a multi-phased and iterative approach to customer engagement that corresponded with the phased development of their PR19 business plan and draft WRMP. The different phases of engagement were focussed on exploring customers' issues and concerns and identifying priorities across their varied customer base. The triangulation of findings at the end of each phase was used to inform, refine and confirm customer outcomes, performance commitments and outcome delivery incentives in the business plan.

The initial phase involved customer engagement activities to confirm that Affinity Water's outcomes were in line with customers' priorities. The methods employed to identify customers' priorities included ethnographic interviews, 'signpost' discussion groups and online surveys, being supported by a wide and rigorous analysis of customer operational data.

The output from the ethnographic interviews included videos of customers discussing the key themes arising from the research.

The key objective of the online survey was to obtain quantitative evidence of customers' agreement for the inclusion of each of the four outcomes in Affinity Water's PR19 business plan. Accordingly, the survey asked participants to score the importance of the four outcomes as well as different aspects of each of the four outcomes on a scale from 1-10. Based on the responses, a mean score was calculated for each of the four outcomes as well as their different aspects.

Further participants were asked to rank order the four outcomes as well as the different aspects of the four outcomes in terms of priorities. Based on these responses, a priority ordering was derived for the four outcomes as well as their different aspects.

Customers' priorities that emerged from this phase was largely uninformed and qualitative in nature.

The initial phase concluded with a triangulation of findings from all the activities undertaken during this phase.

The second phase involved in-depth interviews with customers, use of operational data and customer community surveys via its online customer community panel (The Affinity Water 2020) to derive insights of customers' issues and priorities.

The development of the online panel was a significant aspect of Affinity Water's customer engagement program. It ran a number of activities including surveys, step boards, quick polls and blogs to engage with customers.

The second phase concluded with a triangulation of the findings from the activities undertaken during this phase to confirm customers' priorities and help develop the PR19 performance commitments.

Given that the findings from the second phase were largely qualitative in nature, a mix of qualitative and quantitative methods were used to test and value customers' priorities in the third phase.

- The qualitative studies included focus groups to obtain current customers' views on the draft Water Resources Management Plan (dWRMP) and the draft business plan, focus groups to identify future customers' priorities and forums to discuss the dWRMP with major stakeholders.
- The quantitative studies included the dWRMP online survey, business plan acceptability survey, secondary school online survey, Affinity Water staff online survey and WTP survey.

Instead of relying on a single stated preference WTP survey, Affinity Water developed a benefit transfer database using multiple sources of WTP data. These sources included WTP data obtained from Accent-PJM national comparative reviews of PR14 and PR19 WTP studies carried out across the water industry, ongoing value for money surveys conducted by Affinity Water and a bespoke WTP project.

The bespoke WTP project was conducted by Accent and PJM economics for Affinity Water to explore levels of monetary compensation customers would require to off-set the impact of experiencing a supply interruption. This analysis was used to estimate customers' WTP per avoided interruption in the future.

The third phase concluded with a triangulation of the findings from all activities undertaken during this phase to update performance commitments and outcome delivery incentives.

The final phase involved qualitative methods to understand resilience investment as well as online surveys to obtain quantitative evidence of customers' acceptability of the final business plan and the need for future resilience investment. Like the previous phases, this phase concluded with a triangulation of the findings from all activities undertaken during this phase to confirm the final package and assure the final PCs.

Affinity Water carried out a multi-phased triangulation exercise in developing its final business plan. This was done to inform the customer engagement process of the subsequent phase, inform wider ongoing customer engagement within the company and feed the insights from triangulation into each stage of the business planning process. This multi-phased triangulation approach enabled Affinity Water to evaluate and review findings from all of their evidence and define their objectives for the subsequent phases of their business plan.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade C** (i.e. area falls short of high quality) to Affinity Water in the area of 'Engaging with customers". Ofwat pointed out limitations and called for substantial reworking in the following areas:

- The qualitative research conducted by Affinity Water was subject to limitations such as the use of small sample sizes and the ineffective use of research stimulus.

- Affinity Water highlighted ethnographic interviews and the formation of its online customer community panel as innovative aspects of its customer engagement programme. However, these methods were widely used across companies at PR19 and hence did not indicate much innovation in research methods.
- Affinity Water did not carry out a primary multi-attribute WTP study and instead relied on external data sources to derive WTP for its service measures. Further, the company tested the acceptability and affordability of its plan using bill impacts that were different from those included in its final business plan. As a result, customers' preferences on service levels were not fully reflected in its final business plan.
- Affinity Water's engagement with future customers and customers with experience of resilience issues were found to be insufficient and hence were unlikely to yield robust customer insights.
- Affinity Water's multi-phased approach to customer engagement, which comprised of triangulation of findings at the end of each phase, lacked a critical evaluation of the quality and limitations of the underlying data sources.

Anglian Water

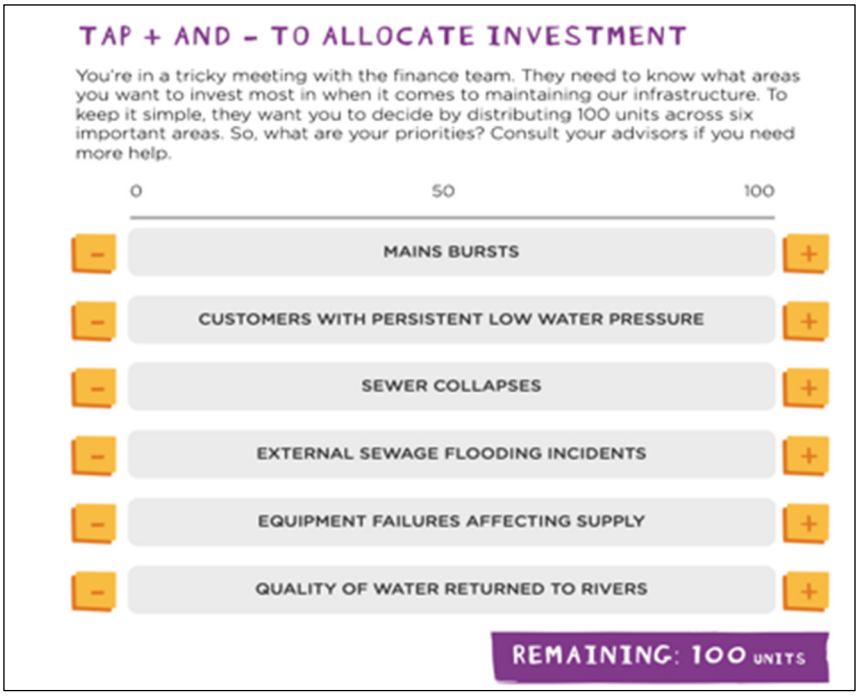
Anglian Water conducted an extensive customer engagement programme that involved targeted engagement, business as usual and activities, operational data and valuation.

The targeted engagement activities were used to understand customers' priorities as well as engage customers on diverse and specific areas. These involved traditional qualitative and quantitative methods as well as innovative methods for exploring customers' issues and identifying their priorities.

- Qualitative methods included focus groups, customer workshops and ethnographic depth interviews.
- Quantitative methods included customer segmentation analysis and online surveys.
- New and innovative channels of customer engagement included a bus tour, a water festival called 'H2OMG' and an electric van tour called 'H2O Let's Go'.
  - The bus tour saw an Anglian Water bus travelling around the region, asking customers to cast their votes or participate in an online quiz on issues such as smart metering and water saving ideas.
  - H2OMG was a water-themed community engagement scheme where visitors interacted with fairground themed attractions (e.g. water wheels for voting, magnet maze for surveys etc.) which were based on the water resource challenges faced by Anglian Water, to elicit customers priorities and their preferences regarding ways to deal with these challenges.
  - H2O Let's Go saw an electric van touring the Anglian region and engaging customers in a series of activities to understand their priorities. One such activity was the 'Be the Boss' activity, which was a digital engagement tool that challenged customers to make key investment choices on behalf of Anglian Water.

Figure 6 shows an example question on priorities presented to customers as part of the 'Be the Boss' activity.

Figure 6: Anglian Water-Be the Boss activity



Source: http://www.h2oletsgo.com/quiz/

Business-as-usual and operational data were also used to identify customers' priorities. These data sources included customer contacts and complaints; social media and online activity analysis to derive insights into the areas that customers were discussing online; quantitative online surveys such as CCW and SIM surveys; an online panel to engage customers in discussion of a specific topic related to water usage; appointment of community ambassadors i.e. Anglian water staff trained to engage with customers across the region who obtained feedback from participants on a variety of topics through click pad voting button technology; setting up of a customer board comprising of several customers to provide feedback on strategic issues and conducting polls on Facebook and Twitter on a wide range of customer issues.

Customers' priorities expressed in the targeted and business-as-usual activities were measured by either asking participants to rate the priority or importance of the outcomes on a scale from 1-5 or rank the outcomes in order of priority. The priorities resulting from these studies enabled Anglian Water to derive a list of core priorities or "anchor measures" that were chosen as attributes for the subsequent customer valuation studies.

Customer valuation research was carried out to provide insights on values that customers place on maintaining and improving water and wastewater services. In addition to using stated preference methods (discrete choice experiments and MaxDiff choice exercises) for valuation, Anglian Water also used a number of innovative valuation approaches. These included:

- A subjective well-being approach to estimate the value of avoiding flooding and roadworks incidents via their impact on customers' wellbeing,

- A Gross Value Added (GVA) approach to estimate the value of avoiding long-term water supply interruptions via their estimated macroeconomic impact on non-households
- An innovative stated preference method that combined a choice experiment on customers' willingness to pay for river water quality improvements with an analysis of the customers' subjective preferences for river water quality using 'Q methodology'.

In addition to helping to select attributes for the WTP research, customer priorities measures were combined with the core WTP measures within a qualitative triangulation framework to create a synthesis of customer insights. This triangulation process involved taking each source of customer source, extracting the relevant views and preferences and then structuring these around Anglian Water's outcomes.

In addition to the qualitative triangulation, Anglian Water also conducted a quantitative triangulation that involved using primary data sources (e.g. Anglian Water PR09, PR14 and PR19 valuation studies) and secondary data sources (e.g. Ofwat and Environment Agency studies, WTP research of other water companies, academic papers etc.) to generate triangulated values for the service measures. Unlike most water companies that derived triangulated WTP values for the key service measures that underpinned their performance commitments, Anglian Water sourced information from customer preference studies to map their key service measures to the wider Service Measure Framework measures via preference weights. As a result, Anglian Water reported triangulated values for the full set of service measures included in the Service Measure Framework. The final triangulated values were used to shape the PR19 investment plans and also informed the performance commitments and performance ranges for the outcome delivery incentives.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade A** (i.e. area reflects high quality, ambition and innovation) to Anglian Water in the area of 'Engaging with customers". Ofwat highlighted the following points in its evaluation:

- Anglian Water carried out an extensive customer engagement programme and provided strong evidence of how it was used to drive the final business plan.
- Anglian Water conducted a multi-stage WTP research which involved innovative valuation approaches such as the subjective well-being approach, the Gross Value Added (GVA) approach and a valuation method that combined a choice experiment on customers' willingness to pay for river water quality improvements with an analysis of the customers' subjective preferences for river water quality using Q methodology. This resulted in a robust customer valuation evidence base.
- The triangulation of customer evidences was based on a qualitative and a quantitative approach. Both these approaches, which followed CCW guidance, were detailed and resulted in incentives that reflected robust customer priorities and values across its package of outcome delivery incentives.
- Anglian Water adopted extensive and innovative approaches to engage with future customers, vulnerable and hard-to-reach customers.

- Anglian Water has undertaken an extensive customer engagement programme that includes activities which focus on all four strategic actions (i.e. futures, actions, community and experience) highlighted in Ofwat's Tapped In report (2017). Examples of some of these activities include engaging extensively with future bill-payers; behavioural nudging techniques to help with debt management; introduction of community ambassadors and the community board; enhancement of the "In Your Area" tool, introduction of the My Account online account management tool etc.

Bristol Water

Bristol Water conducted its customer engagement programme for PR19 in five phases. While the first two phases were aimed at identifying customers' priorities, the remaining phases involved testing options, consulting on business plans and refining and testing acceptability of the plans.

The first phase involved a review of all information that Bristol Water had of its customers' views and priorities. Accordingly, this phase included conducting a customer segmentation analysis, developing a customer dashboard to collate customer feedback on a range of service attributes, conducting a review of all the customer evidence (including PR14 valuation and qualitative research, as well as annual customer surveys) and refreshing understanding of customers' priorities via focus groups and an online survey.

Figure 7 presents a snapshot of the Customer Dashboard used by Bristol Water to identify customers' priorities.

Figure 7: Summary of Bristol Water customer dashboard 2017/18

Service Attribute	Priority (%age of customers rating it very important or quite important)		Customer perception of performance (annual survey) average: 86%	Average satisfaction score from replica survey average: 84.6	SIM dissatisfied (% in 2017/18) n/a	Complaints (% in 2017/18) average: 7%	Inbound calls (% in 2017/18) average: 7%	Overall RAG
Quality	*Provides water that tastes good and has no smell/provide water that looks good*	99.0%	95.0%	88.6%	2.0%	8.0%	9.4%	
Pressure	*Ensured adequate water pressure*	99.0%	94.0%	69.3%	17.0%	5.8%	6.8%	
Reliability	*Provides a regular water supply*	100.0%	99.0%	84.9%	15.0%	2.7%	12.9%	
Leakage	*Repairs leaks as quickly as possible*	100.0%	73.0%	83.7%	19.00%	8.4%	21.1%	
Metering	*Increases number of customers on meters*	76.0%	64.0%	86.6%	2.0%	8.4%	3.3%	
Affordability	*Affordable bills*	99.0%	83.0%					
Road disruption	*Reduces traffic distruption*	99.0%	65.0%			3.2%	0.01%	
Environment	*Helps protect the environment*	98.0%	73.0%					
Lead	n/a			91.9%		0.4%	0.03%	
Service	*Resolves enquires promptly*	99.0%	70.0%	82.80%	13.00%	17.40%	4.40%	

Source: Bristol Water, Section C1: Engagement, Communication and Research.

The second phase involved using a range of methods to establish customers' priorities and values for services. This included inviting customers to focus groups and workshops, hosting customer forums in Bristol Water offices on weekday evenings, talking to customers at summer roadshows by taking their Water Bar to various supply regions and conducting surveys using the online panel of customers to identify customers' priorities and satisfaction with services. In addition, Bristol Water also set up a Youth Board to engage future customers in the development of its business plan and identify their priorities.

Customers' priorities obtained from these various activities were largely based on qualitative responses. However, in the case of some surveys, the customer priorities focus groups in the first phase and the focus group on performance commitments in the second phase, customers were asked to rank the service attributes in order of priority.

Bristol Water utilised a number of different approaches for valuation of its service attributes. These included:

- A core stated preference survey containing interlinked MaxDiff and Package exercises, A slider survey
- Mini stated preference surveys conducted before and after a deliberative resilience event to understand if, and how, customers' valuations change;
- A revealed preference 'averting behaviour' survey which obtained valuations of supply interruptions by asking customers who had been affected by recent supply interruptions about the actions they had to take as a result of losing water supply.
- Benefits transfer analysis ;
- A macroeconomic (GVA) analysis of the costs of disruption to non-households caused by supply stoppages.

Customer valuation data obtained from the WTP studies were utilised within a triangulation framework. The process involved a critical assessment of the findings from the various valuation studies to generate high, low and central estimates of customer valuations for each service attribute. A survey was then conducted which asked customers to choose between alternative business plans that would result from applying the high, low and central WTP results from its triangulation in the company's CBA modelling. Customers' choices in the survey were used to refine the company's triangulated point estimate of customers' willingness to pay. Bristol Water then conducted a further survey to test the sensitivity of the resultant central valuations to ensure the robustness of the triangulation methodology.

Customers' priorities obtained from the range of activities conducted in the first two phases were used in combination with the triangulated customer valuation data to set performance commitments and to develop the draft business plan in the third phase. The last two phases of customer engagement involved using focus groups and surveys to consult customers on the draft business plan, refine the plan based on customers' feedback, develop the final plan and consult customers on the final business plan.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade B** (i.e. overall high-quality plan that meets stretching expectations) to Bristol Water in the area of 'Engaging with customers". Ofwat highlighted the following points in its evaluation:

- Bristol Water carried out an extensive customer engagement programme and provided strong evidence of how this mapped to its business plan outcomes.
- Bristol Water undertook an extensive customer engagement programme that included activities which focussed on all four strategic actions (i.e. futures, actions, community and experience) highlighted in Ofwat's Tapped In report (2017). Examples of some of these activities include setting up a customer forum, conducting summer roadshows, conducting behavioural change campaigns such as 'Beat the Bill' to encourage meter usage etc.
- Bristol Water utilised customer data effectively through the customer dashboard.
- Although Bristol Water used triangulation to generate robust customer valuations, its triangulation approach did not fully adhere to the industry best practice.
- Bristol water engaged effectively with vulnerable and future customers but these were not considered to be sufficiently ambitious and innovative. For example, there

was insufficient evidence of research undertaken to understand customers' underlying risk profiles.

Dŵr Cymru Welsh Water

Welsh Water conducted its PR19 customer engagement programme in three phases: phase 1 was focussed on obtaining information regarding customers' priorities, attitudes and preferences; phase 2 was focussed on determining customer valuations and trade-offs, including willingness to pay for performance improvements and phase 3 was focussed on testing the acceptability and affordability of the business plan. A combination of bespoke customer research, daily customer data sources, open public consultations, behavioural change campaigns and community engagement events were utilised across all the three phases.

The first phase included a number of bespoke research projects to understand customers' priorities and preferences. These projects included qualitative and quantitative surveys to explore customers' views regarding the WRMP, the environment, performance measures, service expectations, water resilience and to understand the priorities and needs of the 'worst-served' and vulnerable customers.

The first phase concluded with a triangulation of customers' priorities based on its research project outputs as well as a wide range of customer evidence. The customer evidence sources used for the triangulation included historical performance data (e.g. PR14 and AMP6 research), continuous engagement data (e.g. Trust tracker, Rant and Rave, Customer Feedback App, CCW Water Matters etc.), primary qualitative research (e.g. performance measures research) and other industry research (e.g. CCW research). The outcome of the triangulation process was a list of service priorities for which customer valuations were sought in the second phase.

The second phase included a number of bespoke research projects to understand customers' priorities and values. Welsh Water used innovative valuation methods to derive the value customers placed on performance improvements. These included:

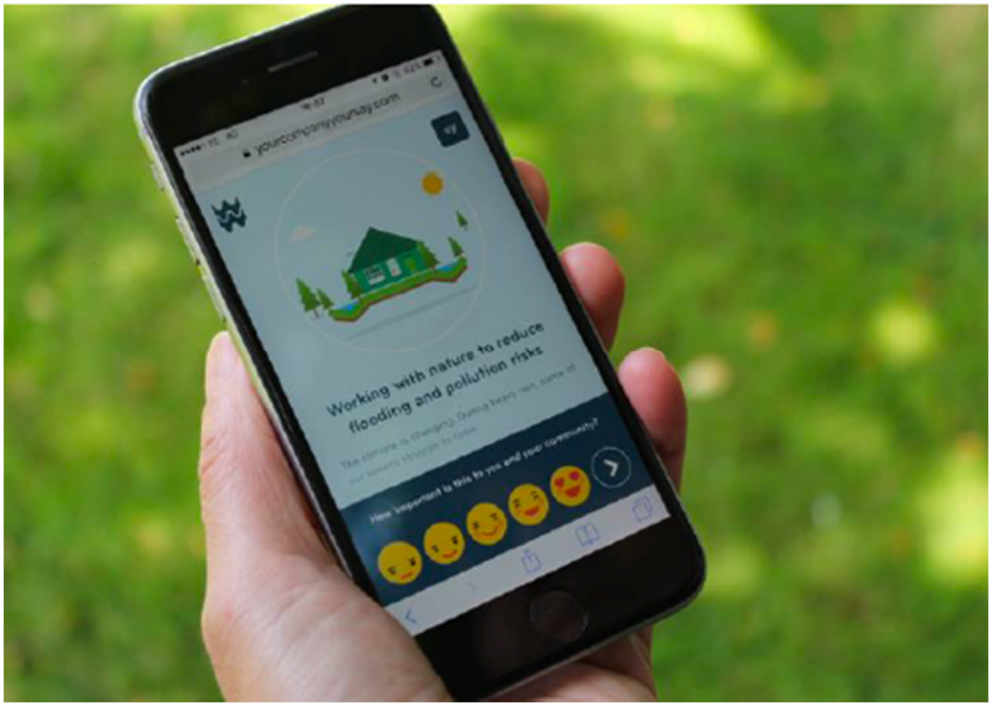
- A core stated preference survey including an interlinked MaxDiff and Package exercise
- A menu-based stated preference survey
- Revealed preference research using a travel cost approach to value bathing and river water quality
- Deliberative valuation workshops.

This phase also included open public consultations such as the Welsh Water 2050 Qualitative (2017 Summer Consultation) and the Welsh Water 2050 Quantitative (Have your say consultation). Both the qualitative and quantitative consultations aimed at identifying customers' priorities for the strategic responses within Water 2050. While the qualitative consultation involved focus groups, the quantitative consultation involved reaching out to customers at various public events throughout Wales via surveys on tablets, company website, Facebook 'Chatbot' and paper questionnaires. In all of these surveys, the participants were asked to rate the strategic responses in order of importance out of a scale of 5.

The Facebook Messenger Chatbot introduced as part of the Have Your Say campaign and the Customer Sentiment Dashboard were two innovative engagement channels that was used by Welsh Water as part of its PR19 programme.

Figure 8 shows the bilingual Facebook Messenger Chatbot used by Welsh Water to identify customers' priorities for the Water 2050 objectives.

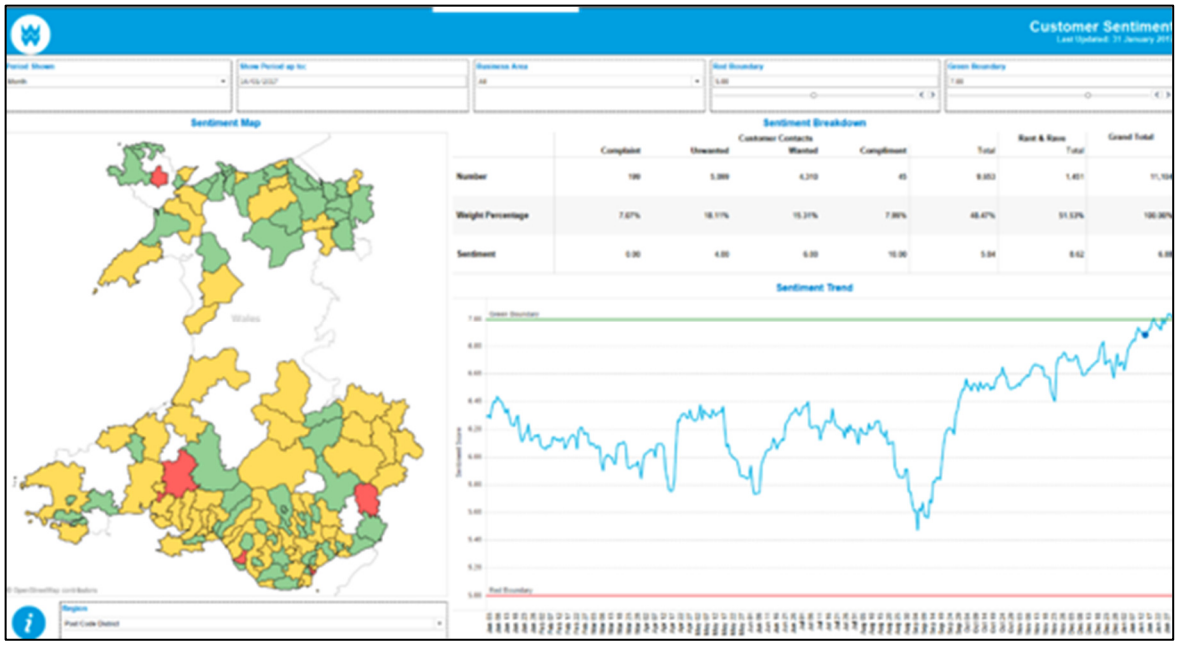
Figure 8: Welsh Water: Customer Engagement Chatbot



Source: Welsh Water, PR19 Business Plan 2020-2025.

Figure 9 shows the Customer Sentiment Dashboard which is an interactive dashboard tool based on customer contact data and ongoing customer tracker data. The tool provides real time quantitative evaluation of customer sentiment across the Welsh water supply region thereby helping Welsh Water identify and focus on the areas that are of importance to its customers.

Figure 9: Welsh Water: Customer Sentiment Dashboard



Source: Welsh Water, PR19 Business Plan 2020-2025.

The customer evidence obtained from the second phase was used to inform performance targets and the outcome delivery incentives.

The final phase which involved customers choosing between plan options, concluded with testing the acceptability of the final plan.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade B** (i.e. overall high-quality plan that meets stretching expectations to Welsh Water in the area of 'Engaging with customers". Ofwat highlighted the following points in its evaluation:

- Despite the fact that Welsh Water conducted a wide range of qualitative research, its quantitative research was subject to limitations for e.g. customer valuations were not accurately reflected in ODI rates.
- Welsh Water demonstrated a sufficient level of ongoing engagement with its customers which was used to develop the innovative customer sentiment dashboard. However, overall, the evidence of innovation was not considered to be exceptional and sector-leading.
- Welsh Water combined its qualitative and quantitative research to derive triangulated customers' priorities. Further, Welsh Water conducted acceptability testing of two versions of its business plan. However, the company was found to be lacking in providing adequate information on its comparative performance when setting the context for its customers.
- Welsh Water conducted extensive engagement with specific customer groups e.g. vulnerable customers and future customers to explore long term and intergenerational issues.

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Northumbrian Water

The PR19 engagement programme of Northumbrian Water (NWL) consisted of continuous customer engagement, PR19 specific insights, PR19 economic research and engagement and PR19 acceptability research.

The continuous engagement channels included tracking research (e.g. telephone surveys to understand customer satisfaction, priorities etc.); bespoke qualitative and quantitative research around strategic aspects of service, including wastewater services, resilience, inclusivity, social tariffs etc. and other insights which included other research (e.g. CCW, Ofwat, charities etc.) and daily interactions with customers and social media analysis.

The PR19 specific insights channel included obtaining feedback from an online panel of customers (Have Your Say) and a number of bespoke projects to co-create specific elements of the business plan. Activities included:

- Workshops and hall tests to understand customers' preferences and the specific areas that they would like to influence;
- Workshops to understand customer and stakeholder views on resilience;
- Deliberative events to understand customers' prioritisation of service improvements;
- Focus groups to help develop NWL's bespoke measures of success
- Deliberative workshops with current and future customers to gather their views on NWL's ambitions within their long-term strategy plan.

Overall, most of these activities were largely qualitative and based on uninformed customer views. Customers' priorities resulting from these activities were either based on rankings or by asking customers to score the importance of a service area/initiative on a scale from 1-10.

The PR19 economic and research engagement programme included service improvement research, service valuation research and bespoke measures valuation research. The service improvements research adopted a door-to-door/on-street approach in which customers were handed showcards, containing details of areas of water and wastewater services provided by NWL, and asked to rate these areas in terms of priority for improvement. Based on the ratings and weights assumed for the high, medium and low priority levels, mean improvement scores were calculated for each of the service measures. These mean scores generated a definitive priority ordering for the service measures which was used by NWL to decide on which service improvements to put to customers as part of their service valuation research.

The primary service valuation research used a slider tool approach to explore customers preferences for service level improvement across a range of service areas. However, this approach was unable to obtain valid measures of WTP due to the fact that customers were given a pot of money to allocate rather than being asked how much of their own money they would be willing to pay for service improvements.

NWL held hall tests with customers to obtain valuations for its bespoke service measures. Further, NWL conducted focus groups to understand customers' priorities regarding leakage, resilience and the environment. Initially participants were asked to rate their priorities without access to any relevant information. However, once NWL presented relevant comparative and cost information to participants, they were able to take more informed decisions and thereby revise their priorities. For example, when initially asked about leakage, the majority of the participants remained unconcerned. However once participants were presented with the relevant information, more than two thirds of customers opted to bring the level of leakage down.

NWL developed a three-phase approach to triangulation.

- The first phase involved a review of existing customer insights, contact and complaint data and comparative and historical information to generate a list of strategic and bespoke service measures.
- The second phase focussed on understanding customers' priorities and their willingness to pay for base service and any proposed service improvements for these strategic and bespoke measures. The key evidence from the second phase were critically assessed and weighted in order to design the acceptability customer research and to develop the draft business plan.
- The final phase utilised expert knowledge, recommendations of the Water Forums and independent peer review to decide on which propositions should be included in the business plan. Customer insights from the first phase and outputs from the second and third phases were triangulated to refine outputs and finalise the PR19 business plan.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade B** (i.e. overall high-quality plan that meets stretching expectations to Northumbrian Water in the area of 'Engaging with customers". Ofwat highlighted the following points in its evaluation:

- NWL conducted an extensive and high-quality engagement programme that involved a wide range of qualitative and quantitative techniques.
- There were concerns about NWL's triangulation approach that was used to develop the ODIs. Customers' benefit values were obtained from a single study and there was no evidence of triangulation against other sources of customer evidence.
- NWL conducted extensive engagement with specific customer groups e.g. vulnerable customers and future customers and a number of bespoke projects to co-create specific elements of the business plan.
- NWL demonstrated strong evidence of adopting the four FACES (increasing customer participation to improve the current and future sustainability of water, encouraging customer behaviour change actions, increasing community ownership of particular aspects of water as an essential resource, and increasing customer control of water in their home or of the customer service experience) themes.

Portsmouth Water

Portsmouth Water's customer engagement programme for PR19 involved analysis of customer tracker surveys and customer contacts data as well as bespoke consumer research pertaining to the development of the business plan, WRMP and Drought Plan. The bespoke research projects used a wide range of engagement channels e.g. co-creation workshops, customer advisory panel, focus groups and online surveys to gather customers' views and priorities on a number of areas including metering, environment, service priorities, water quality etc. These projects covered a wide customer base that included students, vulnerable customers, employees and retailers.

In the initial phases, focus groups were conducted to obtain high-level customers' priorities or outcomes for the business plan. Based on these outcomes, Portsmouth Water developed its PR19 performance commitments and conducted further focus groups to review these performance commitments.

The next phase involved using a number of customer insight sources to set the performance levels and rewards and penalty rates. These customer insight sources included comparative information, historical trends, customer contacts and complaints and bespoke quantitative surveys including WTP surveys and WRMP surveys.

All of these customer insights were brought together in a triangulation framework to set the final performance commitments and target levels. Portsmouth Water used a qualitative triangulation framework which did not involve any scoring or weighting of the customer evidence sources.

The final phase involved using quantitative surveys to test the overall acceptability of the business plan.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade C** (i.e. area falls short of high quality) to Portsmouth Water in the area of 'Engaging with customers". Ofwat pointed out limitations and called for substantial reworking in the following areas:

- There were concerns regarding small sample sizes used in the company's research studies leading to non-robust results as well as a lack of variety in the engagement methods used.
- There was insufficient evidence regarding how Portsmouth Water engaged with future customers and community co-creation.
- Although the company engaged with customers over resilience and intergenerational fairness, there was insufficient evidence that the company understood the risks customers were prepared to take.
- Overall, Portsmouth Water provided insufficient evidence as to how it would meet the four FACE areas of action, in its ongoing business operations.

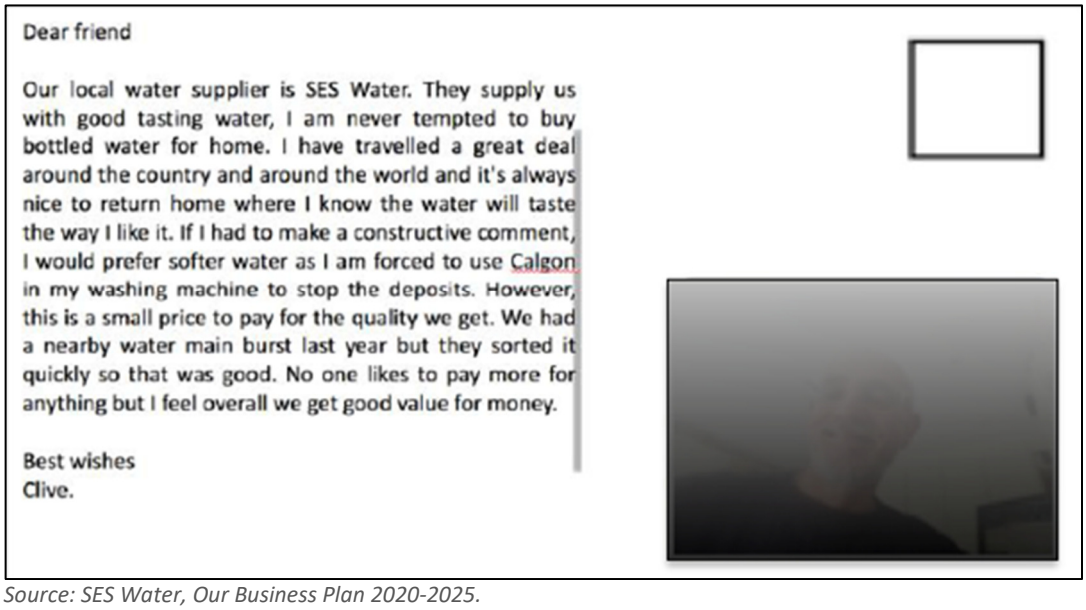
SES Water

SES Water conducted its PR19 customer engagement programme in three phases: the first phase involved identifying customers' priorities, the second phase focussed on exploring customers' priorities in more depth and the final phase involved testing the acceptability of the business plan. A mix of bespoke customer research, customer insights from business as usual activities and a wide range of customer communication channels were utilised across all the three phases.

The first phase consisted of a bespoke qualitative project that involved customer participation in workshops and interviews. An innovative aspect of this research was that prior to the start of the workshops, customers were asked to carry out a number of tasks that would help identify their unprompted priorities. The tasks which were recorded on a smartphone app included activities such as writing a postcard to a friend about SES Water, recording a 'water moments' diary-for-a-day, describing when they used water during the day and how it made them feel, a water deprivation exercise to understand how they would feel without water etc.

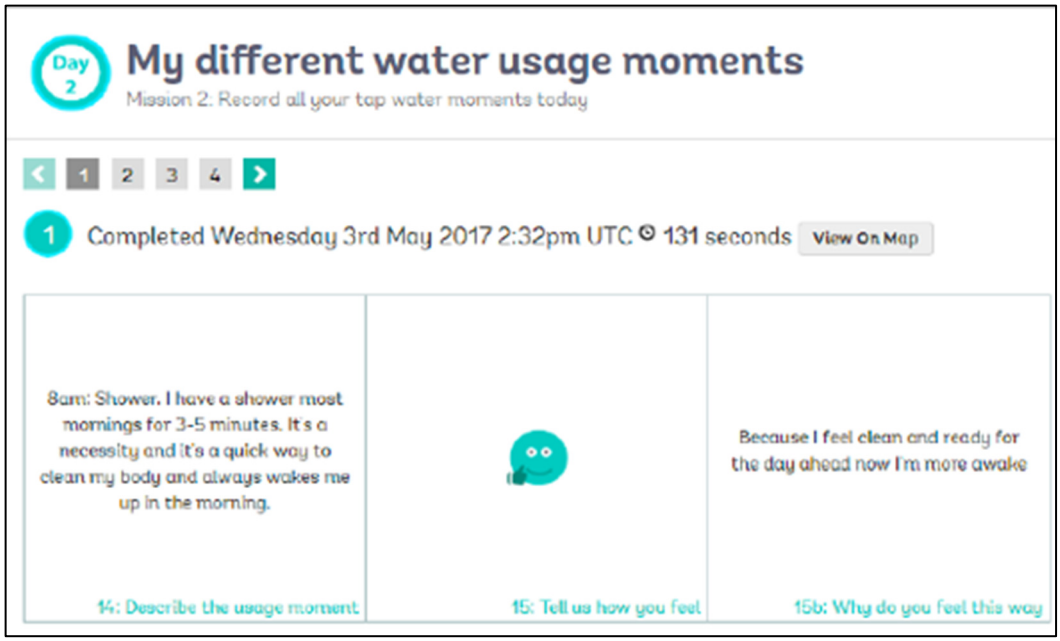
Figure 10 and Figure 11 show an example postcard and a snapshot of the water moments diary recorded by SES customers respectively.

Figure 10: SES Water: Write a postcard



Source: SES Water, Our Business Plan 2020-2025.

Figure 11: SES Water: Water moments diary



Source: SES Water, Our Business Plan 2020-2025.

After participants completed the tasks, they were invited to a workshop or were interviewed at their homes in order to explore their responses in greater detail. This exercise helped SES Water to understand customers' attitudes towards water, customers' views on the service they receive and identify priority areas for improvement.

The second phase consisted of bespoke consumer research that used both quantitative and qualitative methods to explore customers' priorities and values. The main activities in this phase included running a co-creation workshop with customers, future customer events, informal discussions with elderly customers, in-depth stakeholder interviews and WTP research.

SES Water used a choice-based conjoint analysis method to estimate the values that customers attached to changes in service levels. A market simulation tool was created based on the results of the conjoint analysis that allowed SES Water to test sensitivities of customers' willingness to accept the overall bill impact due to changes in service levels. The Gabor-Granger technique was then used to estimate the proportion of customers who would accept a range of overall bill increases.

The bespoke customer research projects were supported by business as usual customer insight e.g. customer contacts, complaints, customer tracker survey etc. and an integrated communications campaign known as 'Talk on Water'. The campaign was aimed at engaging customers on key aspects of service and included channels such as media and social media channels, digital content including copy, films and GIFs, community events, online community forum etc.

The insights generated from the bespoke customer research projects and business-as-usual activities were brought together in a triangulation framework. The triangulation process was not mechanistic and instead involved gathering insights from the various

customer evidence sources, identifying the points of alignment and conflict, understanding the trade-offs involved and using sound judgement to make decisions on key areas for the draft business plan.

The final phase involved using a gamified survey to test the overall acceptability of the draft business Plan, refine outputs and develop the final business plan.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade C** (i.e. area falls short of high quality) to SES Water in the area of 'Engaging with customers". Ofwat pointed out limitations and called for substantial reworking in the following areas:

- Although SES Water used a range of customer data sources, there was insufficient evidence as to how its customer engagement activities have been reflected in its business plan.
- There were concerns regarding the small sample sizes used in some of the customer research studies. Further the triangulation approach did not provide enough evidence on how the research was used to set the ODI rates.
- Overall, SES Water provided insufficient evidence as to how it would meet the four FACE areas of action, in its ongoing business operations.
- There were also concerns regarding insufficient evidence demonstrating the use of comparative information for customers to make an informed decision

Severn Trent Water

The PR19 customer engagement programme for Severn Trent Water included bespoke research, day-to-day analysis of customer data sources, understanding wider customer sentiment and ongoing dialogue with customers.

The bespoke customer research included the following projects:

- Customer needs research and co-creation: The key objective of this research was to understand customers' needs and priorities related to their water services. The research included interactions with an online panel of customers, depth interviews, deliberative workshops and co-creation workshops covering general customers, vulnerable customers, future customers and customers who had suffered service failures. In all of these activities, both unprompted and informed customers' views were explored.

- Strategic challenges – the environment: This research involved deliberative workshops and depth interviews to explore customers' views (both unprompted and informed) and priorities related to the environment (e.g. on catchment management, Water Framework Directive and biodiversity).

- Customer priorities research: This research involved deliberative workshops, depth interviews and engagement with the online community panel to understand current and future customers' priorities.

- Marketing plan focus groups: This research aimed at exploring customers' needs and priorities and their usage and attitudes around water efficiency and sewer use.

- Valuation research: This included stated preference research (a core WTP survey with a representative sample of household and business customers, contextualized WTP survey with respondents who had suffered service failures due to a main burst and sewer flooding, deliberative WTP survey, budget game) and revealed preference research (derived valuations of supply interruptions using the averting behaviour method).

- Choices research: The key objective of this research was to explore customers' prioritisation of improvements in different areas of service. This research involved focus groups, depth interviews and online surveys conducted with household and business customers. The research consisted of an interactive exercise in which customers were presented with the proposed incentive rates, based on a scaled-score derived from the triangulated WTP results for each service area. Customers were asked to provide feedback on the incentive rates, including reducing the rate to zero if they felt an incentive was not appropriate for any service area.

The day-to-day customer data sources used to understand priorities included customer tracker surveys and customer contact and complaints data. The ongoing dialogue with customers included an online community of customers known as Tap Chat. Tap Chat used fun online activities, discussions, surveys and quick polls on a whole range of topics

to help understand customers' views, concerns and needs related to their current and future water and waste services.

The triangulation process involved two parts:

- The first part involved gathering insights from the various customer evidence sources and using judgement to determine customer's relative priority for each of the performance commitments, setting performance target levels and validating incentive rates.

- The second part involved drawing on the various strands of WTP research and triangulating the valuation data to set robust incentive rates and use in cost benefit analysis.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade B** (i.e. overall high-quality plan that meets stretching expectations) to Severn Trent Water in the area of 'Engaging with customers". Ofwat highlighted the following points in its evaluation:

- Overall, Severn Trent Water used an extensive customer engagement programme that consisted of a wide range of qualitative and quantitative techniques.
- There were concerns regarding the narrow customer evidence base that was used for triangulation of customer valuations for use in PCs and ODI rates.
- There were insufficient details provided by Severn Trent Water on the steps that it adopted for its customer valuation research to ensure that it was robustly designed and implemented (including the survey design used and extent of testing conducted).
- Severn Trent Water provided insufficient justification for the adjustments that it made to its triangulated WTP valuations. This meant that its ODIs did not appear to reflect the outcomes of its customer engagement for a number of PCs.
- The company provided insufficient evidence of engagement with future and vulnerable customers.

South East Water

South East Water conducted an extensive PR19 engagement programme to understand customers' priorities. This programme consisted of a number of traditional as well as innovative measures such as:

- Customer segmentation research
- Bespoke customer research
- Continuous customer engagement
- Making customer satisfaction a Board priority

The customer segmentation research involved focus groups, depth interviews and quantitative interviews with customers to define segments and to understand current priorities and satisfaction levels. This shift from "the notion of an average level of service/bill/customer towards attitudinal segmentation" was put forward as a key innovative feature of the business plan.

The bespoke customer research included the following projects:

- Customer priorities and satisfaction research: This research involved using app-based and paper-based pre-tasks and deliberative workshops to understand customers' current and future priorities for water.
- Service recovery priorities research: This involved using focus groups to understand customers' priorities and needs in the event of a water quality incident or supply interruption.
- Bespoke services research: This research involved using focus groups to understand customers' priorities and needs in terms of their daily water supply service to enable South East Water to develop greater personalized and added-value services in areas important for customers.
- Bespoke projects that involved face-to-face, telephone interviews and postal surveys to understand customers' views on water resilience, social tariffs, bill profiles and the priorities and needs of vulnerable customers.
- WTP research: This research involved a quantitative stated preference survey that used an interlinked MaxDiff and Package exercise to estimate the values that customers placed on services.
- Attribute valuation research: This research involved a gamification survey in the form of a computer game carried out online and face- to-face via hall tests. This innovative approach was designed to obtain additional WTP values for triangulating with the core WTP values.
- WRMP research: This research involved community groups, depth interviews and quantitative online surveys. It was aimed at understanding customers' preferences around the range of options that meet the supply-demand balance and their willingness to pay for service levels. The output from this research was used to determine the investment priorities for the WRMP.
- Acceptability and affordability of plan: This involved hosting customer forums and conducting online interviews to test the overall acceptability of the plan.

The continuous customer engagement data sources used to understand customers' priorities included multiple sources such as customer care feedback, industry reports,

social media sentiment, billing and operational contacts, customer satisfaction surveys etc.

An innovative feature of South East Water's PR19 customer engagement programme was the Board engagement programme. The Board members of South East Water actively engaged with customers via multiple channels such as customer research events, contact centre visits, vulnerability events, customer open days etc. This engagement programme enabled the Board to draw valuable insights from customers about their needs and priorities which were then combined with other customer research and translated into outcomes for the business plan.

Customers' priorities expressed through the various engagement activities were used to determine the list of PR19 common and bespoke performance commitment measures. Two pieces of research, the WTP research and the attribute valuation research, were utilised in a triangulation framework to generate triangulated WTP values for customers. Each of these two pieces of research were critically assessed against a number of criteria such as statistical validity, cognitive validity, research approach etc. and assigned weights accordingly. Next, the triangulated valuation results were cross-checked against customer contacts data and the qualitative customer research data and decisions were made by internal experts on how to combine the results in order to generate WTP values for use in cost-benefit analysis. In general, the performance commitment levels were set based on comparative data, historical data, expert knowledge etc. and the results of the cost-benefit analysis was used as more of a cross-check.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade C** (i.e. area falls short of high quality) to South East Water in the area of 'Engaging with customers". Ofwat pointed out limitations and called for substantial reworking in the following areas:

- Overall, South East Water used a wide range of techniques as part of its customer engagement programme.
- There were concerns on the lack of robust data with customers' views based on qualitative studies alone, with no quantitative data to support or validate the findings.
- There was insufficient evidence of the company's ongoing engagement with its customers which indicated the lack of a customer-centric engagement approach.
- South East Water provided evidence of adopting the four FACE areas of action set out in Ofwat's Tapped In report.
- Although the company provided adequate evidence of engagement with customers on long term issues, these engagement activities were not considered to be sufficiently ambitious and innovative.

South West Water

South West Water conducted its customer engagement programme for PR19 in four phases:

- the first phase focussed on establishing customers' priorities;
- the second phase focussed on determining customer valuations for services, including willingness to pay for performance improvements;
- the third phase focussed on understanding customers' trade-offs between services and costs; and
- the final phase involved ensuring and managing the delivery of the plan.

Across all these phases, South West Water utilised a mix of bespoke market research, customer data sources, public consultations and community engagement events.

The first phase involved a combination of qualitative and quantitative methods to identify customers' priorities. Some of the bespoke research projects carried out in this phase included:

- Priorities research: This involved two stages:
  - the first stage involved focus groups and 90-minute sessions using stimulus and live in group voting via a keypad system to identify customers' priorities regarding different service issues
  - the second stage comprised an online survey to quantify customers' priorities.
- Tracking research: This involved a quantitative telephone survey to understand customers' views and long-term priorities
- Future customer priorities: This involved focus and friendship groups to understand future customers' priorities around a number of issues relating to the future challenges for water and wastewater services.
- Defining Performance Commitments: This involved focus groups to test and finalize the performance commitments for the business plan.

Customers' priorities resulting from these studies were largely uninformed and measured via ranking the service measures in order of priority. The results from these studies were segmented by customer groups in order to understand priorities and needs across the varied customer base.

The second phase comprised of a variety of methods to derive customers' valuations for a range of service levels. These included:

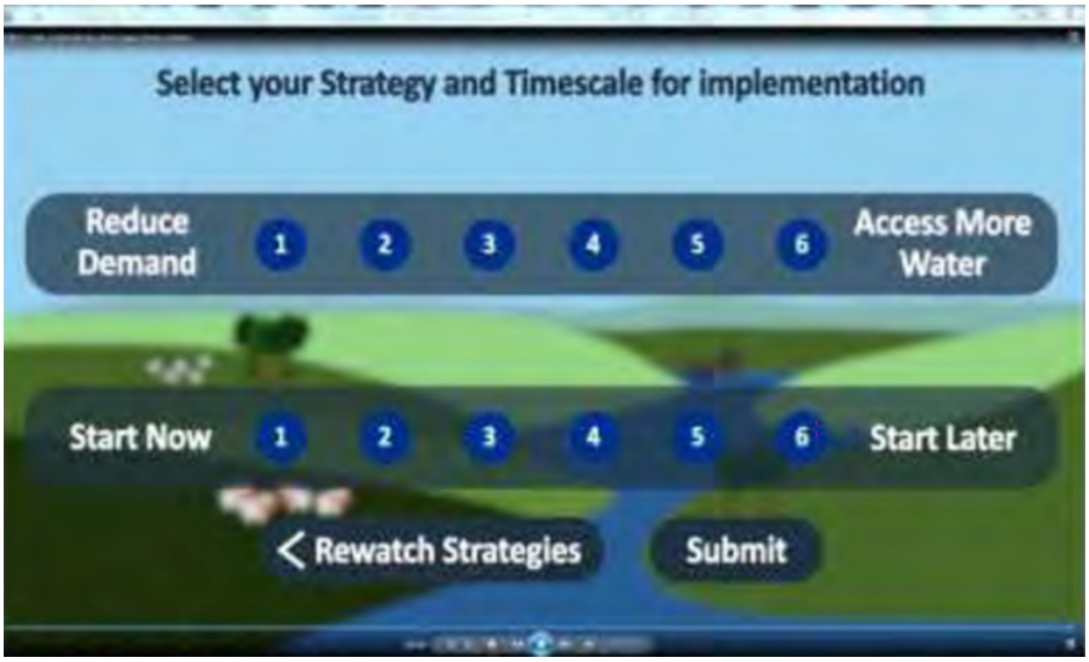
- stated preference methods (e.g. discrete choice experiments, MaxDiff choice exercise and contingent valuation);
- revealed preference methods (e.g. travel cost and averting behaviour methods);
- a GVA approach to understand the non-household impacts associated with water restrictions;
- cost-based methods to estimate the damage costs associated with sewer flooding and
- market value methods to measure the value of shellfish.

An innovative feature of the second phase was the use of two interactive tools i.e. Customer preferences playback sessions and the Interactive Engage One Videos. The

Customer preferences playback sessions involved customer workshops where findings from key valuation studies were reviewed and validated. The Interactive Engage One Video was a personalized interactive video tool sent to customers via email or text messaging to gather customer feedback on the balance of supply/demand options and the future use of water resources.

Figure 12 shows a screenshot of the Interactive Engage One Video tool.

Figure 12: South West Water: Interactive Engage One Video screenshot



Source: South West Water: Final Water Resources Management Plan, August 2019

The final two phases focussed on developing, testing and refining the business plan and setting performance levels and ODIs.

The outputs from the customers' valuation studies were brought together in a triangulation framework involving five steps:

- collate and synthesise research,
- combine valuations into a single set,
- assess the valuations,
- validate against wider evidence base and
- continuous review and update.

The initial steps involved using multiple customer valuation sources such as PR19 WTP research, PR14 stated preference studies and value transfer (PR14 and PR19 evidence from other UK water companies). In line with CC Water's guidance, each of these sources was assessed against a number of validity criteria based on recommendations in CC Water's triangulation process, critical questions for appraising evidence in the HM Treasury Magenta Book, and Defra's value transfer guideline. The customer valuation sources were then weighted to form triangulated values.

The triangulated values were validated and tested against the wider evidence base. South West Water held workshops with the independent WaterFuture Customer Panel

to enable them to review the feedback from the customer playback sessions and understand how customers' valuations would be utilised in the business plan. The feedback from these workshops were used to obtain the final values for use in the business plan. Hence while customer priorities research was used to identify outcomes and performance commitments, the triangulated WTP values were used to set the performance commitment levels and ODIs.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade B** (i.e. overall high-quality plan that meets stretching expectations) to South West Water in the area of 'Engaging with customers". Ofwat highlighted the following points in its evaluation:

- South West Water conducted an extensive customer engagement programme that involved a wide range of qualitative and quantitative techniques.
- The company utilised a number of customer valuation methods including a variety of stated preference techniques and some use of revealed preference methods. However, these were not considered to be sufficiently innovative as most water companies used these methods for their valuations research.
- There was insufficient evidence of how research with different customer segments were included in the business plan.
- South West Water provided evidence of adopting the four FACE areas of action set out in Ofwat's Tapped In report.
- There was insufficient evidence of engagement with future customers and on how South West Water planned to address intergenerational equity.

Southern Water

Southern Water used a five-stage engagement program to co-create the business plan with its customers. The initial phases were focussed on identifying high-level customers' priorities while the later stages focussed on refining these priorities and understanding how customers want these to be delivered. Southern Water used bespoke customer research, PR14 performance, industry research and operational data to draw customer insights for its plan.

The first phase of the research involved the development of a behavioural customer segmentation model and a set of illustrative personas. This enabled Southern Water to develop a more personalised and targeted customer engagement programme.

The second phase was focussed on understanding the views and priorities of customers and this included four major sources of customer insight:

- Consumer attitude and preference research: The objective of this was to obtain customers' views on the strategic direction statement (SDS) and identify their priorities for service measures. The methods used included depth interviews, deliberative workshops, online surveys and face-to-face interviews. In addition, customers were also provided with a mobile app and asked to record their thoughts related to water use via video, text, imagery and sound.
- Operational data: This included household complaints, billing and operational data to help Southern Water understand the issues and areas that are of importance to its customers.
- PR14 performance: The objective of this research was for Southern Water to compare its current performance against its PR14 priorities to understand what might matter to its customers.
- Industry research: This was a review of industry research reports to understand customers' priorities in the UK water sector.

In addition to the above research, Southern Water also sought to identify customers' views and priorities on longer term issues such as affordability of bills, protecting the environment and water network resilience.

The outputs from the second phase of customer research and stakeholder engagement activities were combined to generate triangulated customers' priorities for the PR19 performance commitments. The triangulation process involved a critical assessment of the customer insight sources based on the validity and robustness of the sources. Each of these customer insight sources were then rated on a four-point scale and assigned a rating of 0, 2.5, 5 or 10, a higher number indicating a greater level of importance.

A weight was then applied to each evidence source based on a number of criteria such as the sample size, the customer segment type covered and the type of data source (i.e. primary or secondary). These weights took values between 0.25 and 2.0.

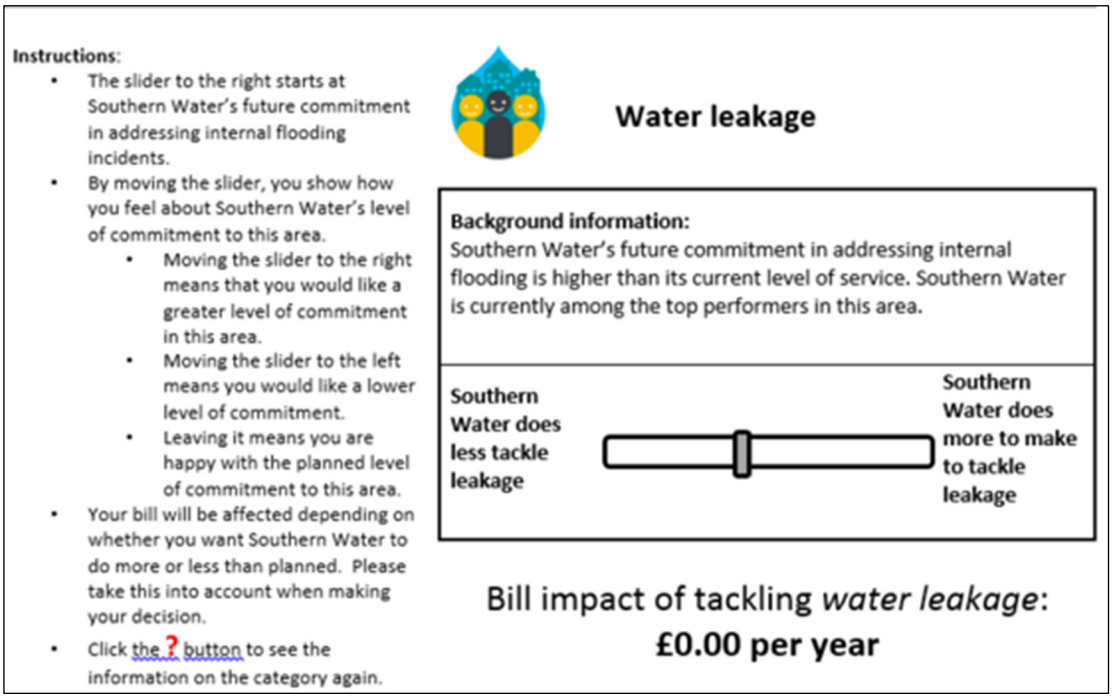
A combined customer priority score was then calculated by summing the weighted ratings across the various customer insight sources. The resultant customer priority scores were normalised to a score between 0 and 20. Similarly, combined stakeholder

priority scores were achieved based on findings from the stakeholder engagement research. The resultant stakeholder priority scores were normalised to a score between 0 and 10. An overall priority score was calculated by adding the two normalised customer and stakeholder priority scores. Finally, thresholds were defined to categorise the rated performance commitments into high, medium and low priorities.

The third phase was focussed on deriving customers' willingness to pay for service improvements in areas that were reported as being of high priority from the second phase of research. Southern Water used stated preference surveys to derive core WTP measures for the service attributes. These included:

- A core stated preference survey including interlinked MaxDiff and package choice exercises plus a future benefits exercise focused on customers' WTP for performance commitments that would provide benefits only in the future (2030 onwards).
- ODI research: The key objective of this research was to test customers' WTP for service improvements beyond the levels that were already incorporated in the plan (and was informed by the WTP study above) in order to set ODIs. For this purpose, Southern Water developed an online slider tool and asked customers to move the sliders if they were willing to pay for further improvements. As the customers moved the sliders, they could see the immediate bill impact of their decisions, thus allowing them to easily calibrate their decisions. Figure 13 shows a snapshot of the slider SP tool used to set ODI rates.

Figure 13: Southern Water: Slider WTP research to set ODI



Source: Southern Water: TA 6.1 Our approach to PCs and ODIs Technical Annex

The output from the third phase was used to set the performance commitment levels and ODIs. The final two phases of research focussed on delivery of the business plan and ensuring that the delivery of the plan was effectively governed and fit for its purpose.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade C** (i.e. area falls short of high quality) to Southern Water in the area of 'Engaging with customers". Ofwat pointed out limitations and called for substantial reworking in the following areas:

- There were concerns regarding the information on sampling provided by Southern Water, to evidence that a wide range of vulnerable and non-household customers were engaged with on a statistically robust basis.
- There was insufficient evidence that Southern Water's primary customer valuation research and approach that was used to derive marginal benefits for use in setting ODI rates was robust
- Concerns were raised regarding the extent to which Southern Water used comparative information to set the context for customers.
- The company did not appear to fully reflect the results of the acceptability and affordability testing of its business plan
- No evidence was found of Southern Water testing the long-term acceptability or affordability of its plan (for example post AMP7 bill profiles) with customers.

Thames Water

Thames Water conducted its PR19 customer engagement programme in four phases. The foundation and first phase were focussed on understanding and testing customers' priorities, the second phase was focussed on testing and confirming performance commitments, ODIs and trade-offs and the final phase involved acceptability testing and finalisation of the business plan.

The foundation stage involved a number of deliberative workshops to understand customers' key priorities and their views on the services that they receive from Thames Water. The first phase involved collating customer data sources such as complaints, contacts, NPS surveys, rant and rave surveys etc. to understand and confirm customers' priorities. In addition, this phase included deliberative workshops, deep dive studies and online panels to obtain customer views on specific topic areas such as intergenerational fairness, lead piping etc.

The second phase involved creating and testing performance commitments that reflected customers' priorities. Thames Water organised roadshows, attended shopping centre events and local engagement forums and utilised a 'Shape your water future' tool to gather customer feedback on the performance commitments. The 'Shape your water future' tool provided information on customers' priorities in terms of service expectations. It was built as an online game where customers could vary service levels to see the associated bill impact. The tool was based on robust data that showed the current performance of Thames Water vis-à-vis its proposed performance and bill impact. The customer data obtained from this tool was used as part of the triangulation for customer preferences research.

The second phase also included WTP research to obtain customers' valuations of a range of service measures. Thames Water utilised a number of approaches to estimate customers' willingness to pay for a range of service measures including:

- stated preference,
- revealed preference,
- subjective well-being,
- market value, and
- value transfer methods.

The WTP values from the main stated preference study were triangulated against WTP values from the other valuation methods. The resultant triangulated WTP values were tested against the wider customer evidence base such as operational and customer contacts data.

The final phase included open public consultations, customer forums, deliberative workshops and a customised version of the Shape your water future' tool to test the acceptability of the plan.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade C** (i.e. area falls short of high quality) to Thames Water in the area of 'Engaging with customers". Ofwat pointed out limitations and called for substantial reworking in the following areas:

- The triangulation approach was found to be inconsistent and unclear
- Although the company was found to engage with a broad range of customer segments, including a wide range of vulnerable customers, little detail was found on how the results of this engagement and the extent to which results were reflected in the business plan.
- Although Thames Water provided evidence of engaging with the communities that it served, there was a lack of evidence of co-creation.
- Thames Water provided sufficient evidence of engaging with both future customers and current customers on long term issues and its final acceptability testing was carried out with a sample of both current and future customers. However, the company did not in all cases incorporate the results of its customer engagement on service levels, resilience and long-term issues into its final business plan.

United Utilities

The PR19 customer engagement programme of United Utilities consisted of a wide range of research methodologies used across the water and wastewater services. The research methods that were used to identify customers' priorities and values can be classified into the following types:

- Behavioural economics
- Trials and experiments
- Exploratory surveys
- Customer research panel
- Customer data analysis and tracking surveys
- WTP research

Behavioural economics research techniques were adopted to understand customers' behaviour and priorities. For example, United Utilities carried out two immersive research projects that sought to understand customers' preferences and values for long-term supply interruptions and river catchment management. In the first project, customers were immersed in a 'fourteen day' loss of water scenario using interactive games, emoji diaries, mock-up text and messages, water rationing activity, etc., to derive customer compensation levels for long-term supply shortages.

The second project involved a 'virtual' video tour of Greater Manchester's River Irwell, a model farm to simulate the impact of water run-off and floor puzzle games to obtain customers' bids for investment in their chosen areas of environmental priority.

Trials and experiments were used to understand customers' opinions and attitudes towards a range of services and operations, including water efficiency, sewer misuse, payment breaks etc.

Exploratory surveys were used to obtain high level priorities across the entire customer database demographic. For example, customer priorities surveys were conducted using qualitative (e.g. depth interviews and focus groups) and quantitative (e.g. online survey) methods to understand how United Utilities should prioritise investments in services. The quantitative research utilised an 'Anchored MaxDiff' exercise to derive priorities.

Further events such as Youthforia were conducted, in collaboration with Youth Focus (YFNW), the organisation behind the UK's Youth Parliament, in order to obtain feedback from future customers on investment priorities proposed in the plan.

United Utilities set up an online customer research community, WaterTalk, to obtain customers' views and opinions on a wide range of issues that would help support business planning. A number of channels including focus groups, online community panels, online surveys, face-to-face and phone interviews etc, were used to understand customers' views and expectations regarding issues related to water quality, interruptions to supply, leakage etc.

United Utilities carried out a detailed analysis of internal data and customer tracking surveys to better understand customers' priorities. These included analysing customer telephone calls, live chat conversations, written complaints, Twitter and Facebook posts, CSAT, SIM and Rant and Rave data etc. to understand customers' priorities regarding a range of service issues such as supply interruptions, bursts and leaks, water quality, lead in water etc.

United Utilities utilised stated preference and revealed preference methods to obtain customers' valuations for service measures. Stated preference methods were used for service valuation, WRMP research, Manchester and Pennines resilience research and valuation of leakage reduction.

The service valuation and WRMP research used discrete choice experiments and online SP slider tools to understand customers' valuations and priorities for water resource management options respectively.

The Manchester and Pennines resilience research aimed at understanding customers' views and priorities regarding options for increasing water resilience. Online surveys were conducted with household customers wherein they were presented with five options ranging from minimal investment to long-term solutions along with information about the risk of supply interruptions and water quality issues, potential number of affected properties and the bill impact of each option. Participants were then asked to rank the five options in order of preference.

Figure 14 shows an example of the survey question posed to the participants as part of the Manchester and Pennines resilience research.

Figure 14: United Utilities: Manchester and Pennines Resilience research

Source: United Utilities: Chapter 2: Voice of the customer: our approach to engagement.

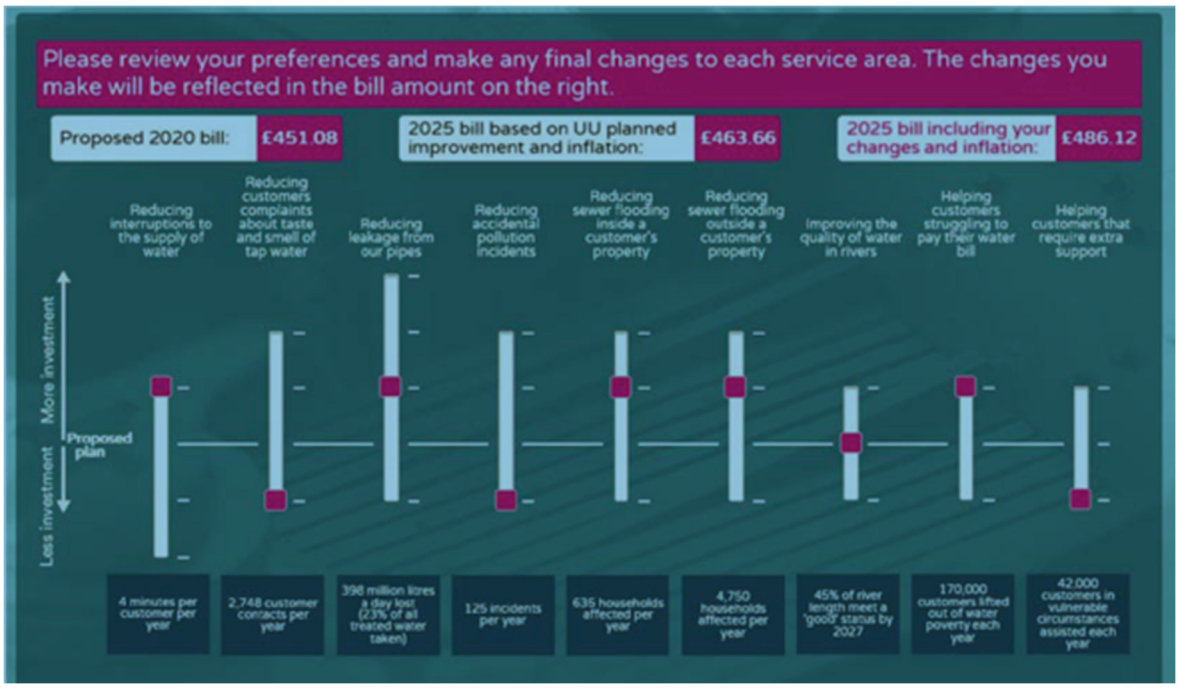
Revealed preference methods were used to estimate the value of bathing water for coastal sites in the North West and to estimate the willingness to pay to avoid water

quality incidents in the future following the Lancashire and the Tameside water quality incidents.

Following an analysis of the aforementioned customer research, United Utilities conducted depth interviews and online interviews with a representative sample of its customers using a slider approach to explore preferences for service and bill levels. After the interviews, customers were presented with each of the service areas individually and asked to select their preferred performance level, in the context of bill impact. Customers were then presented with their preferences for all the service measures on a single screen and asked to review their choices.

Figure 15 shows a screenshot of the slider survey.

Figure 15: United Utilities: Slider survey



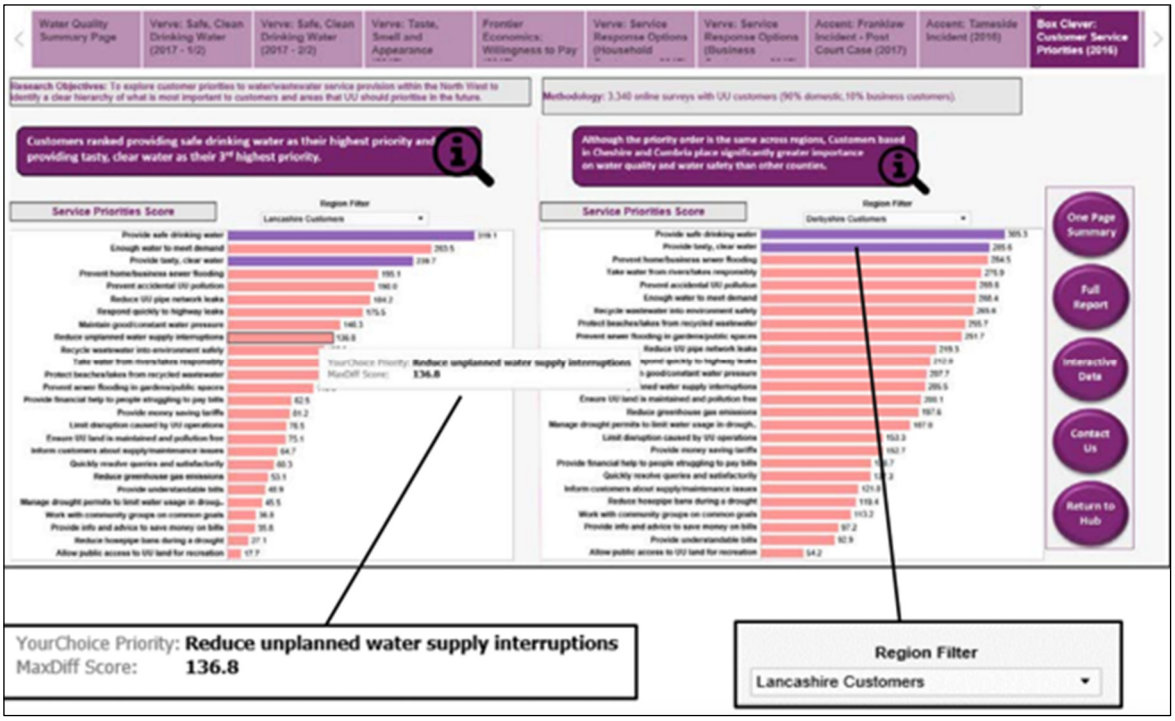
Source: United Utilities: Customer research triangulation: Chapter 5: Supplementary document.

The proportion of customers selecting each level of service was used to generate an estimate of the willingness to pay for each service area.

An interactive digital platform, the Customer Insights Hub, was put forward as an innovative feature of the PR19 customer engagement programme. This tool collates customer contacts data and outputs from bespoke customer research projects in one structured location. The tool proved to be extremely effective in accessing, analysing and triangulating customer insights for long-term business planning.

Figure 16 shows an example of interactive data within the Customer Insights Hub.

Figure 16: United Utilities: Customer Insights Hub



Source: United Utilities: Customer Insights Hub: Chapter 2: Supplementary document.

Customer priorities expressed via the various engagement activities were brought together in a triangulation framework. The specific strands of customer research used in the triangulation process included the following:

- Research that provided for trade-offs between different service levels (e.g. stated preference WTP, acceptability testing, supply-demand sliders)
- In-depth research that provided deeper understanding to customers regarding service areas e.g. immersive research
- Research based on actual experience of customers e.g. revealed preference, customer contacts etc.
- Other research e.g. customer priorities research, online customer research community etc.

The triangulation process involved weighing each of the above customer evidence sources based on a number of criteria such as whether customer experiences were based on actual or hypothetical situations, size of sample, and sample representativeness. After the weighting, results were combined to produce overall valuations and a range for sensitivity testing. These triangulated customer valuations were then used for cost-benefit analysis and to set the outcome delivery incentive rates.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade B** (i.e. overall high-quality plan that meets stretching expectations) to United Utilities in the area of 'Engaging with customers". Ofwat highlighted the following points in its evaluation:

- United Utilities conducted an extensive customer engagement programme that involved a wide range of qualitative and quantitative techniques.
- The WTP research conducted by the company was considered to be high quality, ambitious and innovative.
- Although the triangulation approach was considered to be high quality, there were concerns in the use of the research to inform specific ODI rates and specific cost claims, and in doing so, failure to demonstrate that customer preferences align to the company proposals. These concerns mainly related to the inconsistent application of the triangulation criteria, failure to provide sufficient rationale for the judgements made and insufficient explanations of adjustments to triangulated values.
- United Utilities provided evidence of adopting the four FACE areas of action set out in Ofwat's Tapped In report.
- The company demonstrated extensive engagement with a broad range of customers as well on resilience and long-term issues.

Wessex Water

The PR19 customer engagement programme of Wessex Water included day-to-day analysis of customer data sources, ongoing dialogue with customers and bespoke customer research.

Wessex Water utilised their daily customer data to identify the service areas that were most important to their customers. These customer data sources included results from telephone, SMS and paper surveys on completion of an operational contact, social media comments of customers on Facebook and Twitter, surveys on completion of a web chat on an operational or billing issue and SIM surveys. Further, customer surveys were conducted via the online research panel, 'Have Your Say'. These surveys were related to a wide range of issues such as leakage, bills, home water check services, satisfaction and priorities with respect to different service areas etc.

The bespoke consumer research programmes that aimed to understand and identify customers' views and priorities included the following:

- PR19 Foundation Stage research: This research used qualitative methods (community deliberative events, group discussions, depth interviews and staff workshops) and quantitative methods (online survey, tracking and staff surveys based on telephone interviews, snapshot postal and online surveys and engagement with an online customers' panel) to understand customers' priorities for investment and improvement in services. While the qualitative phase was aimed at understanding customers' support for the strategic direction statement goals, the quantitative phase combined the outputs from the various surveys and interviews to derive customer priority rankings for the strategic direction statement goals.

- Research on customers' attitudes and views on social tariffs, priority services and future customers' priorities related to water use based on interviews and group discussions.

- Resilience research: This research was aimed at understanding customers' views and priorities regarding water resilience i.e. strategies related to water restrictions, sewer flooding, water stoppages and environmental damage. The initial stage of the research consisted of paired depth interviews. This was followed by showing a film and context boards to customers to introduce them to future scenarios and provide them with information about Wessex Water's performance levels. The final stage of the research involved deliberative events held in community venues to conduct an in-depth discussion of responses in the previous stages.

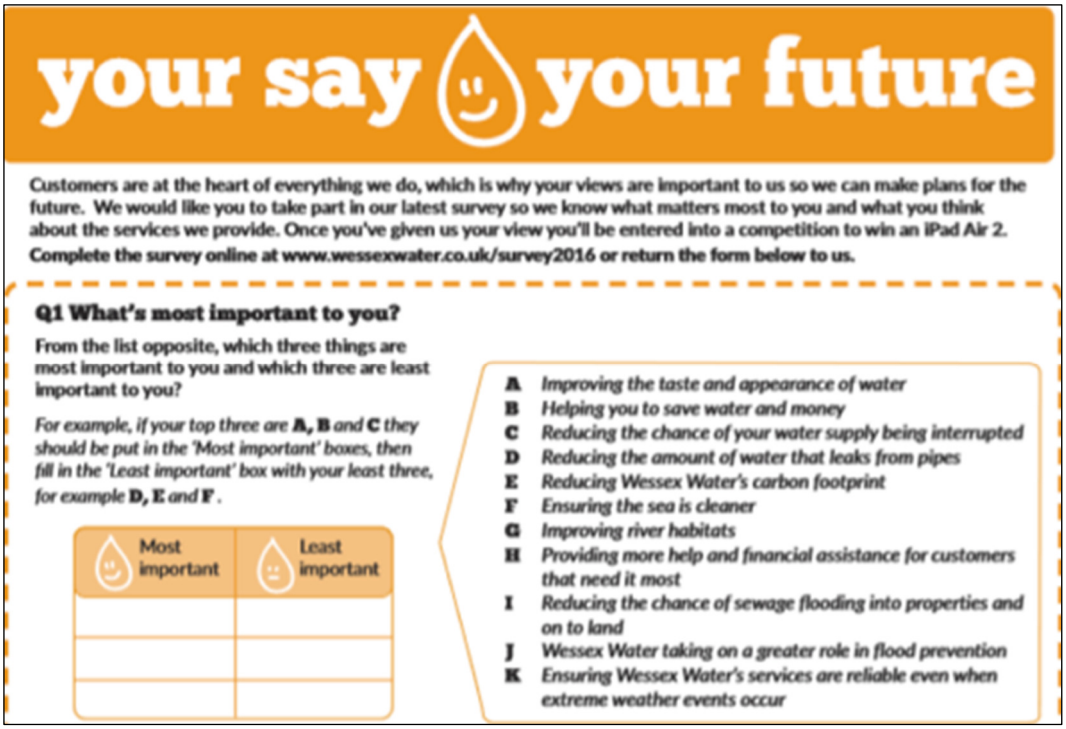
- Young People's panel: This research involved young people in the age group 16-18 across the region. The first session included a 'speed dating' session with executives and a live business task. The second session involved the young people discussing their ideas with senior executives.

- Leakage research: The key objective of this research was to use deliberative workshops and online surveys to explore customers' priorities and values with regard to leakage options.

- Image tracking research: This research comprised interviews conducted to understand customers' priorities, satisfaction and value for money for water and wastewater services.

- Magazine surveys: This involved including questionnaires (Figure 17) in Wessex Water magazines that were distributed to all households in the region for customers to post back (using freepost) or complete online asking about priority service areas.

Figure 17: Wessex Water: A section of the magazine survey



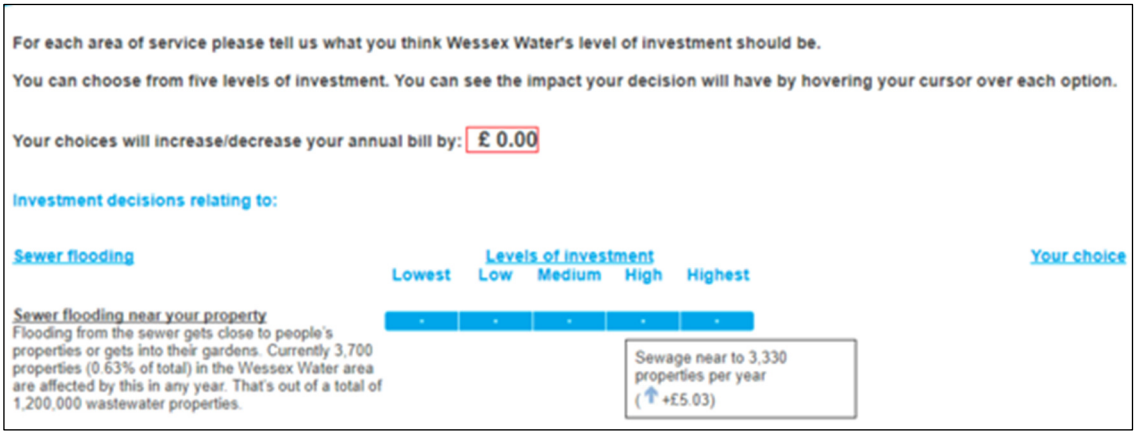
Source: Wessex Water: Appendix 1.1.U: Customer magazine and Facebook chatbot survey

- WTP research: This research included stated preference and revealed preference methods to derive customers' valuations. Stated preference methods included an interlinked MaxDiff and Package exercises for service measures (MaxDiff stage 1 survey), two core SP exercises i.e. a community engagement MaxDiff exercise and a water resources management exercise (MaxDiff stage 2 survey) , an online survey game (Supercharge online game), a series of discrete choice experiments comprised of three lower level choice exercises and a package exercise (Conjoint analysis) and an online slider tool for understanding customers' priorities and values for investment areas. The revealed preference method included conducting post-event surveys using averting behaviour methods to estimate the values of unplanned and planned supply interruptions.

Figure 18 shows an example of the slider valuation tool that was used to derive customers' priorities and values for sewer flooding. Customers were initially presented with each of the service areas and given details regarding the investment levels

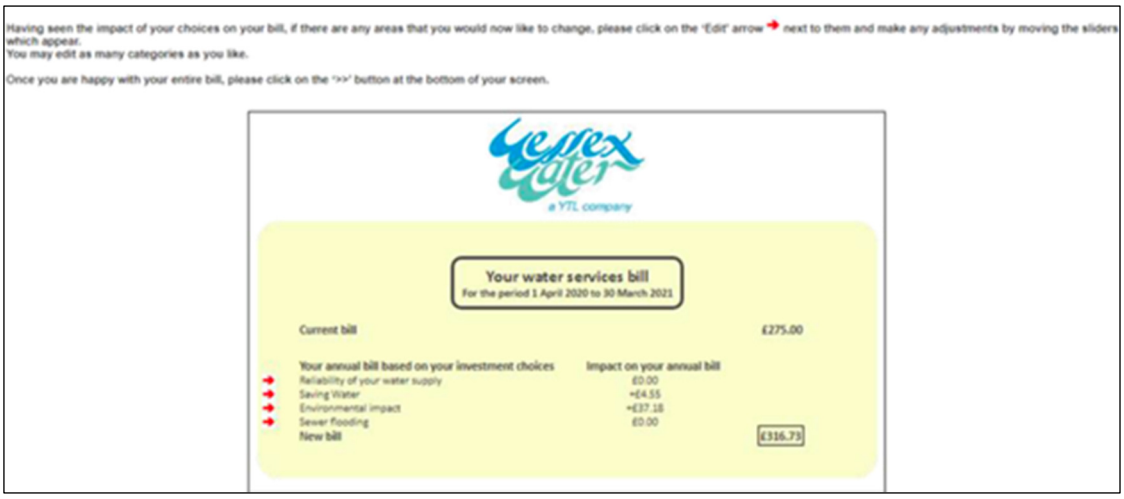
associated with ‘Lowest’, ‘Low’, ‘Medium’, ‘High’ and ‘Highest’. Once customers had rated all the service areas, they were shown the impact of their choices on their water bill (Figure 19) and asked to adjust their choices if they preferred to do so.

Figure 18: Wessex Water: Customer valuation research tool-Options



Source: Wessex Water: Appendix 1.1.G: Willingness to Pay Research 4-Populus

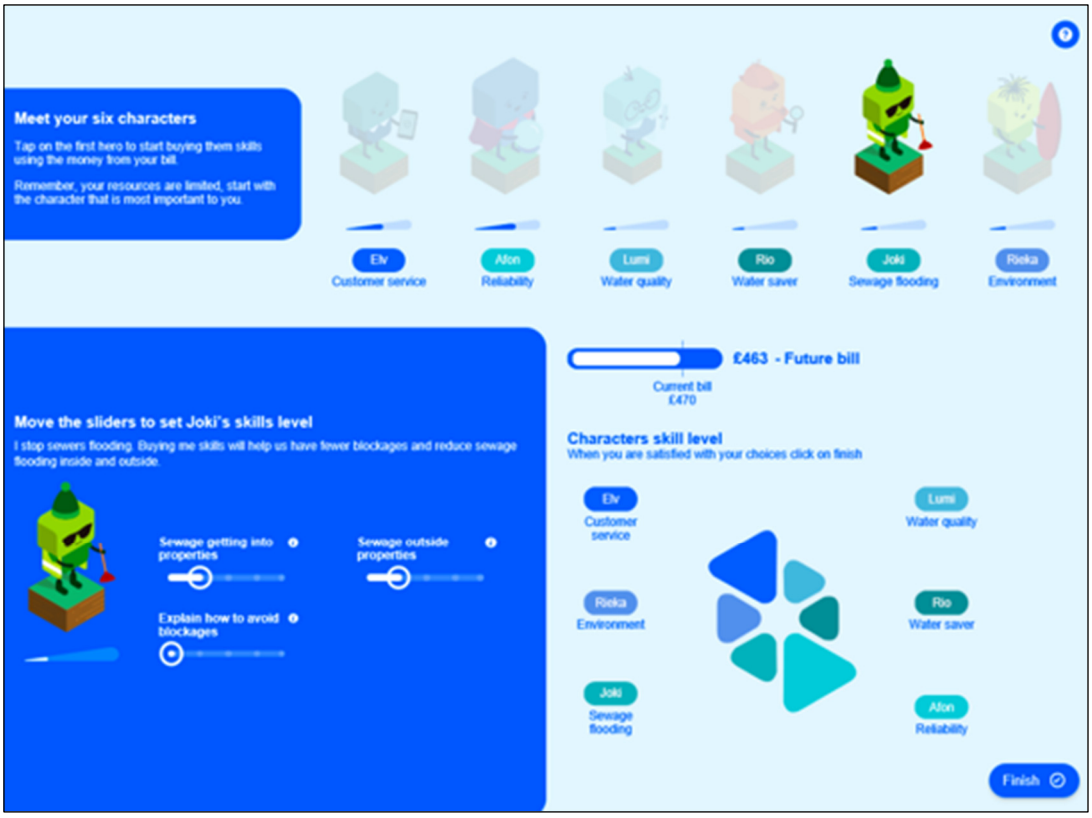
Figure 19: Wessex Water: Customer valuation research tool-Bill impact



Source: Wessex Water: Appendix 1.1.G: Willingness to Pay Research 4-Populus

Figure 20 shows a screenshot of the Supercharge online game presented to customers. This was an online interactive game designed to understand customers’ priorities of services and how much they were willing to pay for these services. The game started off with introducing participants to six characters that represented different service areas. The participants were then asked to prioritise which of the service areas were most important to them and choose how much they were willing to spend on each of these areas. The final screen showed the bill impact of the choices that they had made and participants were allowed to adjust their choices if they wished to do so.

Figure 20: Wessex Water: Screenshot of Supercharge online game



Source: Wessex Water: Appendix 1.1.K: Supercharge game

Customers' priorities that emerged from the engagement program were based on both uninformed and informed views of customers. For example, while the research on social tariffs obtained uninformed customers' views, questions on priorities presented to customers as part of the resilience and the strategic direction statement research were first asked when customers were uninformed and then repeated once customers were made aware of the costs involved.

Overall, in most of the aforementioned surveys, participants were either asked to rate the priority or importance of the outcomes on a scale from 1-10, rank the outcomes in order of priority or indicate the top 3 outcomes in terms of priority from a long list of outcomes.

The output from all the customer valuation studies were brought together in a triangulation framework. The triangulation process consisted of four steps.

- In the first step, weights were assigned to each of the valuation studies based on a number of criteria including cognitive validity, choice architecture, completeness and statistical significance.
- In the second step, these weights were adjusted to take account for other study characteristics such as the age of the research.
- In the third step, additional adjustments were made to the weights based on the qualitative studies such as the resilience and leakage research.

- In the final step, the results were combined to produce overall valuations for the service measures. These triangulated customer valuations were used for cost-benefit analysis and to set the incentive rates.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade B** (i.e. overall high-quality plan that meets stretching expectations) to Wessex Water in the area of 'Engaging with customers". Ofwat highlighted the following points in its evaluation:

- Wessex Water conducted an extensive customer engagement programme that involved a wide range of qualitative and quantitative techniques.
- There was insufficient evidence of customer research to test long term bill profiles and the final PCs and ODI rates were not directly tested with customers.
- Wessex Water used comparative information through the use of Discover Water data to set the context for its customers
- The company's approach to triangulation was considered to be objective, well-reasoned and transparent which utilised a range of customer data sources including stated preference, online games, revealed preference, online surveys and hall tests.
- The company did not provide sufficient evidence of customer support for its largest ODI (Event Risk Index).
- Wessex Water provided evidence of adopting the four FACE areas of action set out in Ofwat's Tapped In report.

Yorkshire Water

Yorkshire Water conducted an extensive PR19 engagement programme that consisted of both traditional and innovative measures to gain a better understanding of the needs and priorities of their diverse range of customers.

The bespoke consumer research programmes that aimed to understand and identify customers' views and priorities included the following:

- Valuing Water: This research involved focus groups, in-home interviews and online surveys to understand and identify customers' priorities for short-term and long-term service improvement areas.

- Comparative performance: This research involved group discussions, depth interviews and online surveys to identify customers' priorities for Yorkshire Water's performance commitments and understand their views regarding the company's performance vis-à-vis industry performance and bills.

- Outcomes, Performance Commitments and ODIs: This research involved deliberative workshops, focus groups and depth interviews to understand customers' views and support for the package of outcomes, performance commitments and incentives.

- Household Retail Service Level Assessment: This involved focus groups, depth interviews, online and CAPI interviews to investigate customers' priorities regarding retail service offerings from Yorkshire Water and trade-offs between different levels of service.

- Lifestyles: The key objective of this research was to gain a deeper understanding of customers' expectations and priorities related to water use. The initial phase of the research involved an extensive customer segmentation analysis to identify different customer groups. In the next phase, these groups were engaged in innovative consumer reveal workshops and ethnographic amplification depth interviews. Finally, the feedback from the reveal workshops and ethnographic interviews were assessed by an anthropologist to determine customers' priorities and preferences for water.

- Participation in Frontiership Initiatives: This research comprised of immersive workshop sessions, face-to-face depths, immersive focus groups and in-depth interviews with community leaders and ambassadors to explore which aspects of service were most important and a priority to customers.

- Kelda Management Team Customer Closeness Sessions: This involved an innovative customer engagement channel in the form of customer closeness sessions based on a 'speed dating' format. This format enabled Directors and the senior management to engage directly with customers to understand their views and preferences regarding their most important areas of service, for example leakage and pollution

- Consulting on the Long-Term Strategy: The objective of this research was to understand customers' future priorities in order to co-develop the long-term strategy plan. The research involved focus groups as well as an online survey which was conducted via Yorkshire Water's online community.

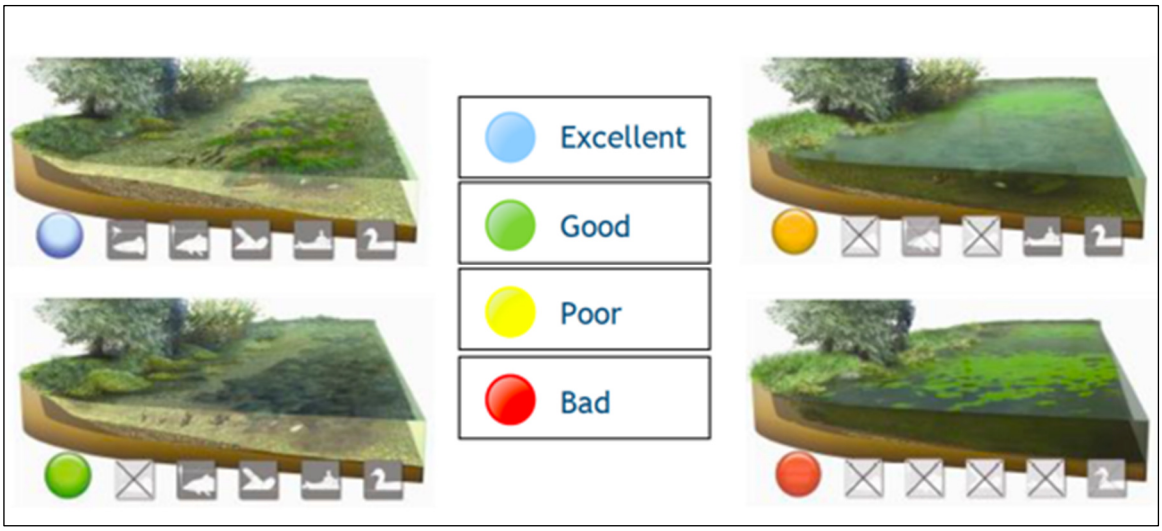
In addition to the above research projects, Yorkshire Water conducted an extensive program to obtain customer valuations for a range of service measures. The customer valuations program involved a total of six rounds of research i.e. two phases of stated preference, two phases of revealed preference and two phases of experimental methods were used for customer valuation.

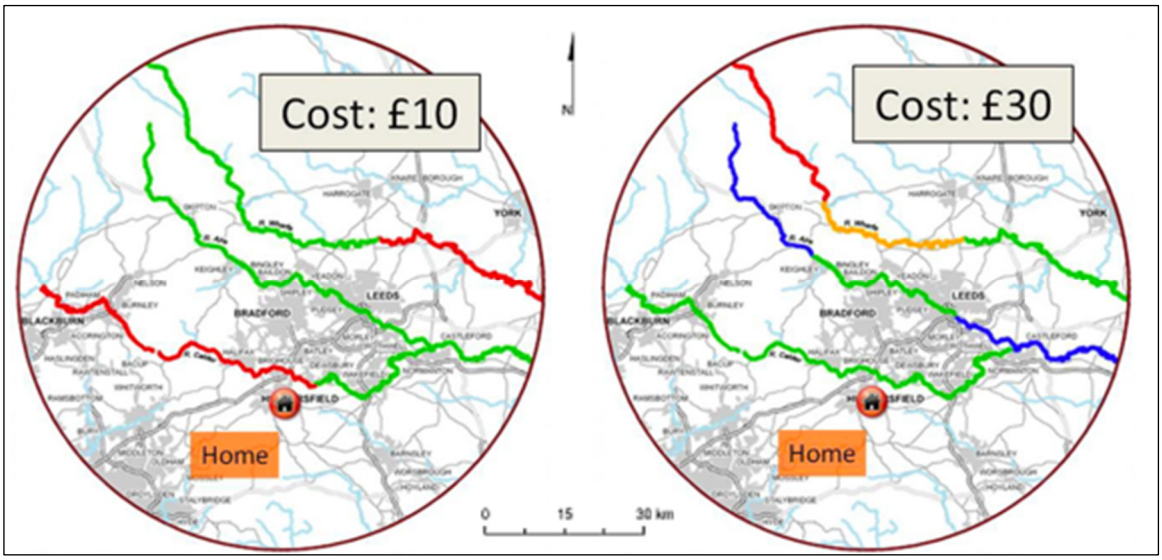
The first phase of the stated preference approach included using discrete choice experiments to estimate customers' valuations for a range of service measures. The second phase of the stated preference approach included using discrete choice experiments and MaxDiff methods to estimate customer values for different severity levels across the various service measures.

The first phase of revealed preference approach involved using visitor survey results to estimate welfare values of river water quality improvements in the Yorkshire region. Two approaches were used to obtain the welfare values: a travel cost model and a visual spatial choice experiment.

In the visual spatial choice experiment, participants were first introduced to the categorization of river water quality (top part of Figure 21) and then asked to choose between two future scenarios for the main rivers in the study area, with each scenario associated with a cost in the form of an annual increase in the household water bills payable by each household in the region (bottom part of Figure 21). The innovative aspect of this work was the (i) presentation of hypothetical scenarios to participants in the form of colour-coded and annotated maps with each map showing a different spatial pattern of water quality change and (ii) estimation of models based on combined stated preference and revealed preference data to derive use and non-use values derived from water quality improvements.

Figure 21: Yorkshire Water: Visual spatial choice experiment





Source: Yorkshire Water: Appendix 5g: Understanding Customer Values: Revealed preference River Quality Report

The second phase of the revealed preference work involved using the averting behaviour approach to estimate the expenditure of businesses in Yorkshire on water service related devices e.g. pumps, filters, and back-up supplies to alleviate water services failures.

Experimental techniques were used in the form of an interactive online tool, which allowed participants to adjust service levels and observe, the immediate effects that this had on their bill and a trust experiment that analysed customer data sources to estimate the impact of customers' trust on the financial performance of Yorkshire Water.

Customer priority measures that emerged from the engagement program were based on a mix of uninformed and informed views of customers. For example, while the lifestyles research was based purely on uninformed customers' views, the WTP research studies were generally based on informed views. Some of the activities such as engagement with customers via Yorkshire Water's online community started off with uninformed views but allowed customers to become informed customers as they moved along the price review process. Overall, in case of majority of the surveys, customers were either asked to rate the priority or importance of the outcomes on a scale from 1-5, rank the outcomes in order of priority or answer Max Diff questions to obtain the preference rankings for service measures.

The output from all the customer valuation studies were brought together in a triangulation framework. The triangulation process consisted of several steps:

- In the first step, all WTP values obtained from the six rounds of research were converted to comparable units of measure.
- In the second step, recommended values from each of the six rounds of WTP research were chosen for triangulation.

- Next, each of the six WTP studies were critically assessed based on a number of criteria such as statistical robustness, psychological robustness, completeness of value, consistency with previous research such as PR14/09 and consistency with PR19 qualitative evidence obtained by Yorkshire Water. Against each of these criteria, a rating of high, medium and low were assigned to all the studies.

- Finally, a qualitative discussion was conducted to discuss the pros and cons of each of the valuation methods and a value was recommended based on a simple average of all the different values.

Ofwat Initial Assessment of plan

In its initial assessment of PR19 business plans, Ofwat assigned a **Grade B** (i.e. overall high-quality plan that meets stretching expectations) to Yorkshire Water in the area of 'Engaging with customers". Ofwat highlighted the following points in its evaluation:

- Yorkshire Water conducted an extensive customer engagement programme that involved a wide range of qualitative and quantitative techniques.
- The WTP research conducted by the company was considered to be high quality, ambitious and innovative and it included traditional valuation methods such as stated and revealed preference as well as innovative valuation methods that included behavioural economics techniques (e.g. context, framing etc.)
- The company provided evidence of adopting the four FACE areas of action set out in Ofwat's Tapped In report.
- Yorkshire Water did not provide sufficient evidence of customer research underpinning longer term priorities, risk appetites, or the needs of future customers.