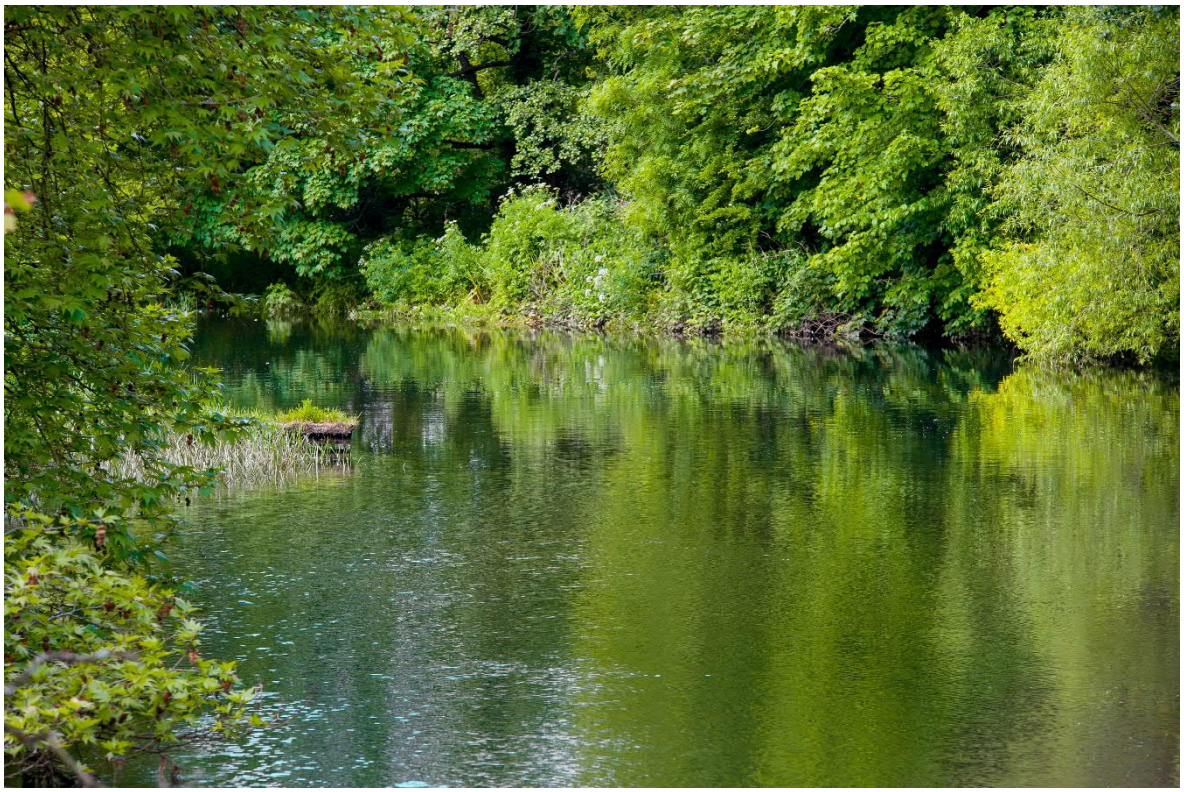
Strategic Regional Water Resource Solutions: Annex D Stakeholder and Customer Engagement Report

Standard Gate Two Submission for Thames to Southern Transfer (T2ST)

Date: November 2022



Thames to Southern Transfer
Stakeholder and Customer Engagement Report
T2ST-G2-REP-13 (Annex D)

November 2022

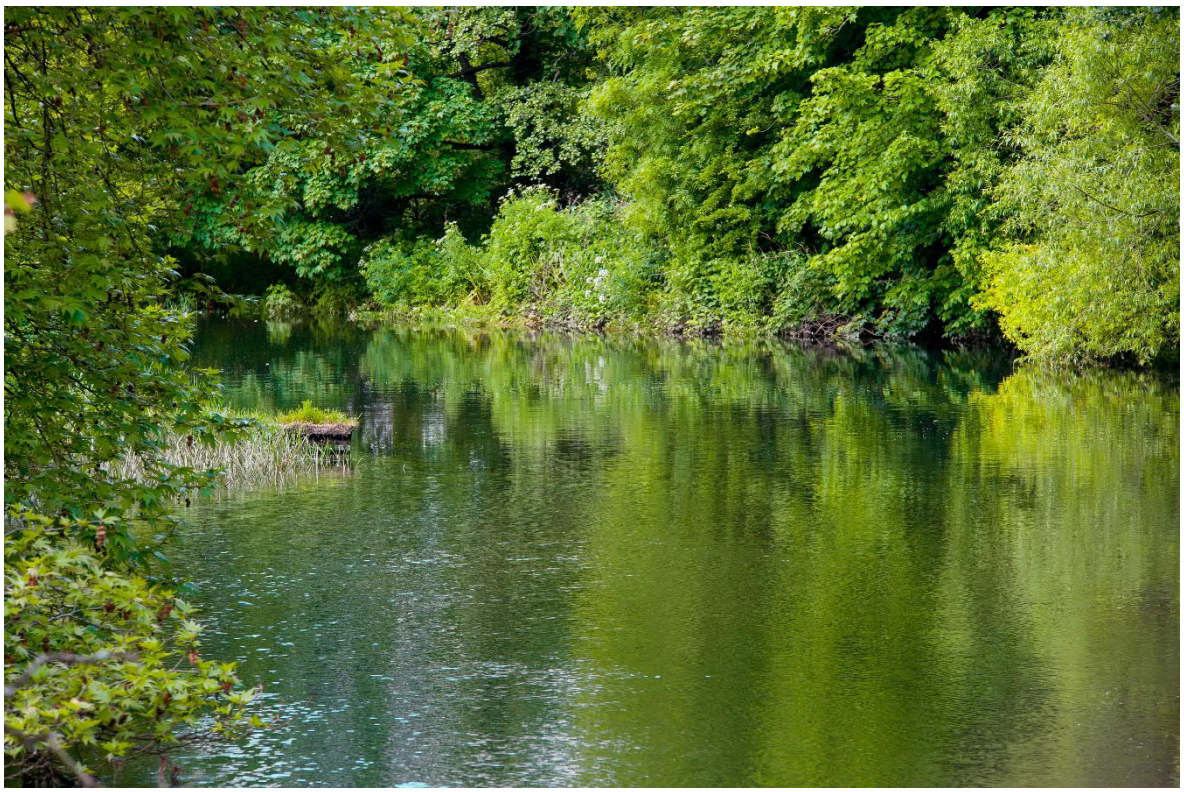
Notice

Position Statement

- *This document has been produced as the part of the process set out by RAPID for the development of the Strategic Resource Options (SROs). This is a regulatory gated process allowing there to be control and appropriate scrutiny on the activities that are undertaken by the water companies to investigate and develop efficient solutions on behalf of customers to meet future drought resilience challenges.*
- *This report forms part of suite of documents that make up the 'Gate 2 submission.' That submission details all the work undertaken by Thames Water and Southern Water in the ongoing development of the proposed SROs. The intention of this stage is to provide RAPID with an update on the concept design, feasibility, cost estimates and programme for the schemes, allowing decisions to be made on their progress and future funding requirements.*
- *Should a scheme be selected and confirmed in the Thames Water and Southern Water final Water Resources Management Plans, in most cases it would need to enter a separate process to gain permission to build and run the final solution. That could be through either the Town and Country Planning Act 1990 or the Planning Act 2008 development consent order process. Both options require the designs to be fully appraised, and in most cases an environmental statement to be produced. Where required that statement sets out the likely environmental impacts and what mitigation is required.*
- *Community and stakeholder engagement is crucial to the development of the SROs. Some 'high level' activity has been undertaken to date. Much more detailed community engagement and formal consultation is required on all the schemes at the appropriate point. Before applying for permission Thames Water and Southern Water will need to demonstrate that they have presented information about the proposals to the community, gathered feedback and considered the views of stakeholders. We will have regard to that feedback and, where possible, make changes to the designs as a result.*
- *The SROs are at a very early stage of development, despite some options having been considered for several years. The details set out in the Gate 2 documents are still at a formative stage and consideration should be given to that when reviewing the proposals. They are for the purposes of allocating further funding not seeking permission.*

Disclaimer

This document has been written in line with the requirements of the RAPID Gate 2 Guidance and to comply with the regulatory process pursuant to Thames Water's and Southern Water's statutory duties. The information presented relates to material or data which is still in the course of completion. Should the solution presented in this document be taken forward, Thames Water and Southern Water will be subject to the statutory duties pursuant to the necessary consenting process, including environmental assessment and consultation as required. This document should be read with those duties in mind.



THAMES TO SOUTHERN TRANSFER (T2ST)

Annex D Stakeholder and Customer Engagement Report

Ref: T2ST-G2-REP-13 (Annex D)

November 2022

1. Overview

1.1. Introduction

1.1. This document is the annex to Section 9 of the Gate 2 submission for the Thames to Southern Transfer (T2ST) Strategic Resource Option (SRO) and provides more detailed information on the engagement undertaken with stakeholders and customers to inform the feasibility and conceptual design up to Gate 2. It includes an overview of the engagement activity, the main points of feedback from stakeholders and customers and how they have been considered in the on-going programme of work and development of the solution.

1.2. We developed our approach to engagement in line with RAPID's guidance for Gate 2[1]. We have built on the foundation of stakeholder and customer activity completed through Gate 1, the representations made to RAPID at Gate 1 and direct feedback from RAPID and other regulators.

1.3. It is important for clarity, consistency and efficiency that the engagement activity to inform the development of the SROs is coordinated with dialogue on the regional plans, company Water Resource Management Plans (WRMPs) and company PR24 Business Plan submissions. The customer and stakeholder engagement activities have been undertaken on that basis, to ensure there is a flow of insight through the process as illustrated in Figure 1.

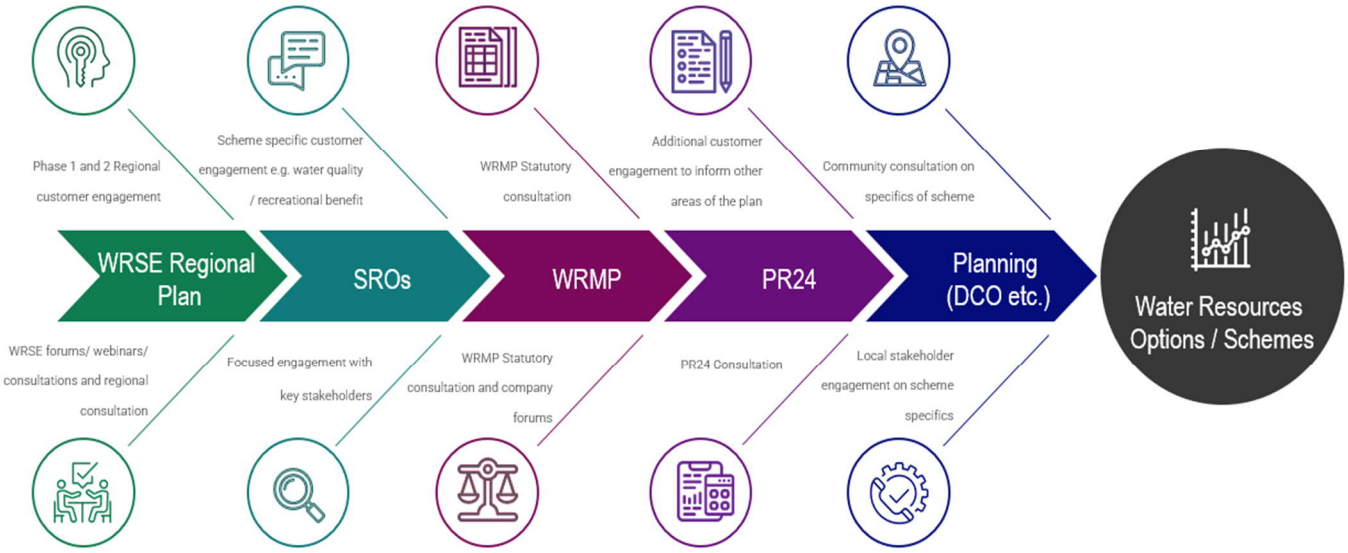


Figure 1: Insight flow from customer and stakeholder engagement

1.4. The structure of the annex is as follows:

[1] Strategic-regional-water-resource-solutions-guidance-for-gate-two_Feb_2022.pdf (ofwat.gov.uk).

- Section 2 describes our engagement with stakeholders including an overview of activity, a summary of feedback and how we have considered the feedback.
- Section 3 describes our engagement with customers to inform the ongoing development of the solution.
- Section 4 sets out the next steps.

2. Engagement with stakeholders

2.1. Summary of activity during Gate 1

2.1.1. The stakeholder engagement activity undertaken through Gate 1 was two-fold:

- Activity to inform the development of the South East (SE) regional plan, to ensure stakeholders understand how T2ST, and other solutions, fit within the strategic water resource planning framework.
- T2ST specific discussions focused on legal, regulatory and strategic issues which could prevent the scheme progressing or substantially change the design of the scheme. The engagement was primarily with:
    - the parent water companies focused on their respective water supply networks, current and planned infrastructure upgrades, and local intelligence to help shape potential locations of the intake, pipeline routes and connection into Southern Water's grid to enable a shortlist of feasible options to be developed.
    - other potential recipients of the water to understand their potential future water needs and preferences for a water transfer.
    - regulators to ensure legal and regulatory issues were fully addressed.

2.1.2. RAPID published its draft decision on our Gate 1 submission in September 2021, alongside the draft decisions for the other standard SROs. The draft decision determined that good progress had been made for all the assessment areas.

2.1.3. RAPID held a representation period on its draft decision until 8 October 2021. RAPID received two representations on its draft decision on T2ST SRO. The representations were received from Group Against Reservoir Development (GARD) and a joint representation from the solution sponsors - Thames Water and Southern Water. GARD raised concerns around the transparency of cost estimates, deployable output assessments and stochastic flow data, carbon costs, transporting water outside the Thames catchment, sources of supply and the water companies raised points in relation to the solution progress and budget. RAPID responded to the representations in its final decision[2]. A summary of the topics and responses is presented in Table 1, alongside T2ST teams consideration of the main points in the representations.

[2] Final-decision-publication-Thames-–-Southern-transfer-Cover.pdf (ofwat.gov.uk)

Table 1: Summary of the main topics raised in representations to RAPID and responses

Topics	Response/ action
Lack of transparency of cost estimates, with further detail requested	RAPID: Guidance will be provided on solution cost information to be published at Gate two. T2ST: We have complied with guidance provided by RAPID in respect of the publication of cost information, go to Section 8.
Lack of transparency in deployable output (DO) assessments and the reliability of stochastic river flow data	RAPID: The work completed on the DO assessment is sufficient for Gate 1 with further guidance to be provided for Gate 2. Furthermore companies are expected to follow the WRPG for all assessments. T2ST: We have complied with guidance provided by RAPID in respect of all technical assessments, and the work is compliant with the WRPG. For information on DO specifically go to Section 4.
Shortcomings in the assessments of carbon costs	RAPID: The information presented on carbon was sufficient for Gate 1. Gate 2 will need to comply with the WRPG and carbon assessments will need to be published. T2ST; We have complied with guidance in respect of all technical assessments, and the work is compliant with the WRPG. For information on carbon specifically go to Section 6.
Disagreement that water should be transported outside the Thames catchment	RAPID: Water resources planning at a regional and company level is following a best value approach. This allows consideration of how water transfers, particularly from new sources such as those considered for T2ST, can best be used to bring about best value at a national and regional scale, therefore going beyond Thames' catchment. T2ST: The purpose of regional planning is to consider the challenges and solutions from a regional perspective, looking beyond water companies boundaries, and getting a best value plan for the whole region. The T2ST team has continued to work closely with WRSE and provide data and information as required to input to the regional modelling which will aid decisions on the solutions to be taken forwards. The draft regional plan and water companies draft WRMP24s will be published for consultation in November 2022.
Challenge that the use of STT would be cost effective as the source water and that desalination on the South coast would be preferable	RAPID: This solution is concerned about investigating and developing a transfer route. Potential sources utilising this transfer route are being investigated and developed in other gated submissions and through the water resources planning processes and as such Severn Trent Water and United Utilities do not need to be involved. Southern Water's investigation and potential use of desalination is outside the scope of T2ST SRO. T2ST: No comment. ..
Challenge that T2ST should progress to Gate 2	RAPID: The need, utilisation, deployable output, and timing of the scheme is to be determined by ongoing regional modelling and WRMP24 work and as such the solution should proceed to Gate 2. T2ST: No comment.
Opportunity to utilise Gate 1 underspend for Gate 2 studies	RAPID: It is permissible to merge Gate 1 and Gate 2 allowances thereby allowing underspend on Gate 1 activities to be used for Gate 2 activities. T2ST: This was welcomed and permitted technical assessments to proceed through Gate 2.

2.1.4. RAPID published its final decision[3] in December 2021 and included eight actions and no recommendations. The actions and T2ST responses are presented in Section 13 of the Gate 2 submission.

[3] Final-decision-publication-Thames-–-Southern-transfer-Cover.pdf (ofwat.gov.uk)

2.1.5. We reviewed, and took account of, the feedback received from regulators and stakeholders, to ensure we had a robust understanding of issues and concerns, as well as opportunities, and this information informed the work programme and the engagement through Gate 2. For example, there was a specific focus on DO modelling in Gate 2 following the engagement, and feedback from, Gate 1.

2.2. Overview of Gate 2 engagement

2.2.1. Our engagement activity through Gate 2 built on previous engagement, taking account of issues and concerns raised by stakeholders, and was designed to:

- fit within the regulatory process established under the guidance of RAPID, with the activity designed to be appropriate to the stage of the scheme development i.e. conceptual design, ahead of more detailed engagement associated with scheme planning and consent, if the scheme is taken forwards.
- coordinate with regional and company strategic water resource planning activity to ensure a clear and joined-up approach for stakeholders.

2.2.2. The engagement approach through Gate 2 has two main parts:

- activity to inform the development of the SE regional plan to ensure stakeholders understand the approach, the planning challenge, the range of solutions identified and considered and how T2ST, and other SROs, fit within the strategic planning framework. This includes establishment of stakeholder groups to help guide the development of the plan; proactive engagement with the wider stakeholder community through meetings, webinars and consultations; and the use of a dedicated engagement platform. Further information is presented in section 2.3; and
- engagement with regulators and identified stakeholders on the scheme itself, working collaboratively, to develop the feasibility assessments and inform the conceptual design of the scheme. This engagement has included close working with regulators and stakeholders to jointly define the scopes of work and technical methods; discussions with stakeholders who have specialist technical knowledge to share relevant information and work collaboratively; as well as regular updates to the wider stakeholder community.

2.3. Engagement as part of the developing SE regional plan

2.3.1. Water Resources South East (WRSE) is working closely with the six water companies in the South East region, and the wider stakeholder community, to develop a resilient water plan for the region. The regional plan will be reflected in the SE water companies statutory Water Resource Management Plans 2024 and the schemes included in the preferred regional plan will be included in the company's WRMP24s in a consistent and aligned manner. It is therefore important that stakeholders have an awareness of, and understand, the overall strategic planning process, the key decision points, and opportunities to contribute.

2.3.2. Engagement has been, and continues to be, a thread throughout the development of the regional plan. This means that the engagement was designed to happen at relevant and formative stages such that feedback could be considered and the approach and methods amended in response, where this was appropriate. The engagement involves a wide range of water users – customers, businesses, other

sectors and stakeholders – and aims to understand their priorities and preferences, and to take these into account in decisions leading to the draft regional plan.

2.3.3. WRSE, and the member companies, have endeavoured to work openly and transparently, sharing information in a timely way, and across a range of channels and activities, to enable participation and ensure stakeholders are clear about why they are being consulted, the scope of the consultation and how that fits with the wider water resources planning landscape.

2.3.4. WRSE established stakeholder groups to help guide the development of the plan. The groups are the stakeholder advisory board, environmental stakeholder group and the multi-sector stakeholder group. These groups meet regularly and minutes of meetings are published to ensure open and transparent working.

2.3.5. In addition to these specific groups, WRSE has proactively engaged with the wider stakeholder community through meetings, webinars and consultations throughout the development of the SE regional plan. Thames Water and Affinity Water have continued to jointly host a regular Water Resources Forum to give stakeholders the opportunity to keep up to date, and contribute to, the discussions on the long-term planning. Similarly Southern Water has continued to engage through its established Water for Life Hampshire Stakeholder Group.

2.3.6. In addition WRSE has strong links with other regional groups to ensure the opportunities to share resources effectively are understood and fully investigated and to ensure a coordinated national water resources picture.

2.3.7. The WRSE engagement and consultation programme is hosted on a dedicated engagement platform Water Resources South East (engagementhq.com) and has three main phases:

- Plan and prepare – To 2020 the focus was on the "building blocks" of the plan. This included the development of the technical methods, approaches and tools that would be applied in the development of the plan for example the forecasts for future growth and demand for water; the environmental assessments; as well as the regional policies for the region. WRSE ran a programme of webinars and held topic specific consultations to give stakeholders the opportunity to engage and input to the process.
- Develop – During 2021 the focus broadened and set out the planning challenge for the region, shared information on feasible solutions, including the SROs, and the approach to determine the best value plan.
- Consult and update – During 2022 the focus moved to the plan itself. WRSE held an 8-week period of engagement and consultation on the emerging plan. In the Autumn 2022 a further round of consultation will be undertaken on the draft plan, alongside the statutory consultation on the draft WRMP24s.

2.3.8. WRSE produced a Stakeholder Engagement Report which summarised the extensive engagement and consultation activity that has taken place to date. The report was published alongside the emerging plan in January 2022[4]. Annex 1 (to this Annex D)

[4] WRSE Stakeholder Engagement Report, January 2022

provides a summary of the engagement completed to date to support the development of the SE regional plan.

2.3.9. The engagement and consultation on the emerging regional plan took place between January and March 2022. The emerging plan gave early sight of the big issues and emerging solutions to gain initial feedback from stakeholders. As well as publishing documents for review and comments, a series of online workshops were held for stakeholders to provide an overview of the plan, the work to date and further work planned to transition to a best value plan.

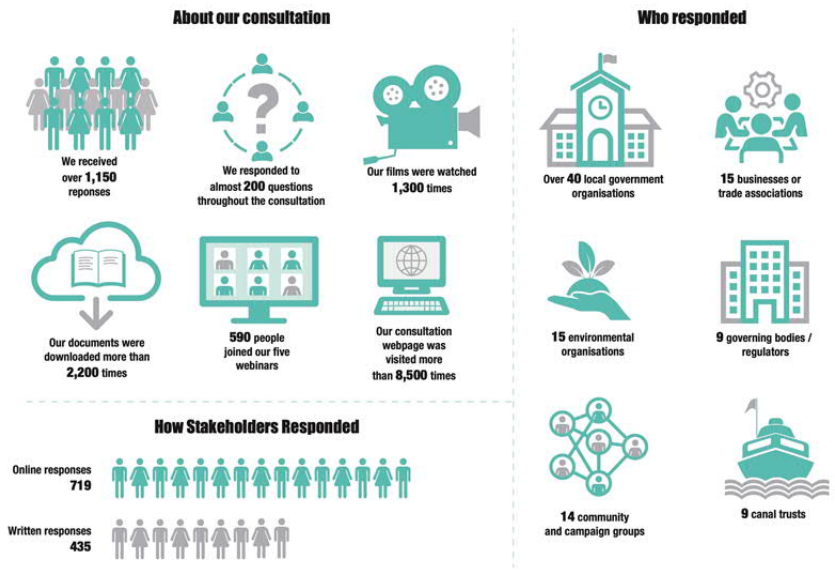
2.3.10. WRSE, and the SE water companies, proactively raised awareness of the consultation on the emerging plan and undertook a range of actions to explain the plan and encourage wide participation. The activities included:

- Pre-briefings with several organisations including Council for Protection of Rural England (CPRE), National Farmers Union (NFU), National Infrastructure Commission (NIC), Blueprint for Water and Consumer Council for Water (CCW).
- Meetings with Group Against Reservoir Development (GARD) to discuss their technical challenges.
- Proactive engagement with the media to ensure clear and balanced reporting.

2.3.11. WRSE, and SE water companies, received 10 requests for technical data and information from the Group Against Reservoir Development (GARD). These requests included information on abstraction licences, stochastic river flow data, scheme deployable output data and cost data. These data requests were treated as Environmental Information Requests (EIR) by Thames Water in view of the detailed nature of the information requested. Thames Water, in collaboration with WRSE and other SE water companies, collated and provided the data, where this was available, in line with EIR requirements and timetable. Thames Water also held a meeting with GARD's technical advisor to review the information requests to ensure there was a complete understanding of what information could be provided and what information could not be provided and the reasons for this.

2.3.12. WRSE received over 1,150 written responses to the consultation. Figure 2 provides a summary of the consultation, and responses, on the SE emerging plan. Over half of the individual responses to the consultation on the emerging plan focused on specific water resources options identified for development, such as large new reservoirs, strategic water transfers, and water recycling schemes.

Figure 2 The consultation on the SE emerging plan



2.3.13. WRSE published a response document[5] in May 2022 which provided a summary of the consultation responses, highlighted the main themes and issues raised in the responses and provided WRSE's consideration of the points and resultant action. A summary of the feedback, with specific reference to water transfers, is as follows:

- The majority of respondents supported water transfers in principle, with a preference amongst respondents for transfers using canals or rivers over pipelines.
- Those who disagreed with transfers expressed concerns about the financial and environmental costs of pumping water long distances, with some respondents considering that long distance pipelines should be avoided.
- Others wished to see the development of more local options within the SE, for example to make the South East water neutral, avoiding a reliance on water that may not be available in the longer term.
- GARD, and its supporters, supported imports to the region, but were opposed to the T2ST stating that water should retained in the Thames catchment, not exported from it.
- Other comments raised concerns about the lack of detailed information about the carbon impacts of proposed transfers and requested details on how this would be offset and mitigated, and the costs.
- The difference between raw and potable transfers was highlighted with the risks of Invasive Non-Native Species (INNS), water chemistry and pathogens from raw water transfers noted as specific concerns. DWI highlighted the need to fully consider water quality risks - for raw transfers, considering the upstream risks and whether mitigation is required at the receiving location and for potable

[5] WRSE Emerging Regional Plan: Consultation Response Document, May 2022

transfers, transfer times, disinfection risks, and mixing requirements in transfer infrastructure.

- NE cautioned that new pipelines would only be acceptable if designated sites and priority habitats are avoided wherever possible, and/or suitably mitigated/ compensated where appropriate to minimise ecological damage and landscape impacts.

2.3.14. T2ST project team reviewed the relevant feedback to the WRSE emerging plan consultation and considered relevant points in relation to the scheme, namely:

- The selection of a treated water transfer rather than a raw water transfer.
- Publication of more detailed information in relation to the technical assessments.
- Careful consideration of the route corridor with detailed engagement with Local Planning Authorities (LPAs) and the North Wessex Downs AONB at an appropriate time.

2.4. Targeted stakeholder engagement

2.4.1. Engagement with stakeholders has been embedded throughout the Gate 2 programme of work; it builds on the Gate 1 engagement with regulators and stakeholders and has been expanded to include local planning authorities and selected NGOs.

2.4.2. The T2ST project team developed a stakeholder map to support the engagement through Gate 2. Table 2 summarises the identified stakeholders, engagement approach and the main discussion topics.

2.4.3. We are committed to work openly and transparently with stakeholders and have endeavoured to achieve this by:

- Sharing information, and providing regular updates to stakeholders, on the programme of work and the studies underway and giving opportunity to comment.
- Working with regulators and stakeholders to jointly define the scopes of work and technical methods.
- Engaging with stakeholders who have specialist technical knowledge, or a specific interest, to share relevant information and work collaboratively.
- Engaging with a wide range of stakeholder organisations to share work to develop the plan for our long-term future water supply and the potential solutions at a formative stage of development of the plan, and to listen to feedback and take it into consideration.
- Raising awareness on the challenge for water resources, the planning process and opportunities to contribute and input to shape long-term plans at a formative stage.

Table 2: Overview of T2ST specific engagement

Stakeholder	Engagement approach	Key activity
Solution sponsors – Thames Water and Southern Water	Monthly Programme Board Engagement with relevant technical teams	Continued close working between Southern Water and Thames Water at both a programme and technical level to understand, and take account of, their respective water supply networks, planned and future infrastructure, to inform the design work on the intake, pipeline routes and connection into Southern Water's grid.
Other potential recipients and potential connections	Specific project meetings	On-going discussions with South East Water to understand their potential future water needs and preferences for a water transfer. Through these channels South East Water confirmed that a spur from the T2ST was not in their preferred plan but they were keen to keep the option open in the future should T2ST proceed. In addition the SE regional modelling includes the full range of spurs and connections including the development of Kennet Valley spur as well as SEW spur.
Other SRO project teams	Regular project update meetings with SESRO and STT SRO teams	T2ST is dependent on the prior development of a new source of water, namely Severn Thames Transfer (STT) or South East Strategic Reservoir Option (SESRO). Discussions have focused on infrastructure interfaces and to ensure the feasibility of the T2ST preferred options, together with consenting relationships.
RAPID	Monthly check-in meetings	To share the programme of work, provide updates on activity, and discuss risks and opportunities.
NAU	Regular engagement including monthly progress meetings and topic specific Technical Liaison Groups (TLGs)	Collaborative working to enable early constructive discussion. The TLGs set up to date are terrestrial environment, aquatic ecology, water quality and algae monitoring. The last two are in conjunction with SESRO and T2AT.
DWI	Technical engagement	Focus on the drinking water quality assessment, completed in collaboration with the STT and SESRO SRO teams, as well as the sponsor company teams. Engagement on water quality monitoring and consideration of emerging substances.

Local planning authorities (LPAs)	Introductory briefing sessions with LPAs through May and June 2022	To introduce the scheme, provide an overview of the strategic water resources planning framework, the work being undertaken to Gate 2 and to discuss emerging planning issues and opportunities at this early stage. The local and county planning authorities engaged to date have been Hampshire County Council, Vale of White Horse District Council, Oxfordshire County Council, Test Valley Borough Council, Basingstoke and Deane Borough Council, West Berkshire Council
North Wessex Downs AONB	Initial briefing session	To introduce the scheme, provide an overview of the strategic water resources planning framework, the work being undertaken to Gate 2 and to discuss emerging planning issues and opportunities at this early stage.
Wider stakeholder community	Company-led Forums	Thames Water hosts a regular Water Resource Forum, jointly with Affinity Water, to provide information and opportunity to input on the development of the regional water resources plan and company activity. Four Forums have been held during Gate 2 - in November 2021, February, June and September 2022. At the November 2021 Forum information was shared on each SRO, including the programme of activities and summary of work packages to provide visibility of the work areas for each SRO and the opportunity for discussion on these options. Southern Water first introduced T2ST to members of Water for Life - Hampshire Stakeholder Group (November 2020) and continued to raise the profile of the scheme at subsequent meetings.

2.4.4. Key topics of engagement and how these have been considered and reflected in the work undertaken and the scheme design are summarised in Table 3.

Table 3: Overview of how stakeholder feedback has informed the scheme development

Topic	Stakeholder feedback	T2ST response
Route and site selection including the detailed assessments of the preferred corridors and site locations.	NAU identified risks with options that involved raw water transfers. NAU provided some data on environmental constraints to inform the route and site selection process. NAU provided feedback on the shortlisted options, recognising there remained challenges with all options. NAU did not indicate that the preferred routes were not feasible. NAU provided information on the expected mitigation, for example, for crossing watercourses.	The work has refined the options to two potable transfers. Information and feedback provided by NAU has informed route and site selection. Mitigation suggestions provided by NAU have been included in the design and environmental assessments. Constraints and location-specific challenges flagged by NAU have been identified as areas for further work.
Water quality surveys and algae, fish, macrophyte and INNS monitoring.	The monitoring plan was agreed with the NAU.	Following agreement, the monitoring activity has been progressed and output will be shared at timely intervals
Environmental assessment reports (EAR, HRA and SEA)	There has been regular with the National Appraisal Unit (NAU) during Gate 2 with a focus on development of the pipeline route corridor and location of above ground infrastructure. The environmental assessment reports were shared with the NAU for feedback.	Feedback has been addressed in the environmental assessments. Further information is presented in Annex B1.
Drinking water quality assessment and the water quality monitoring and emerging substances	Progress meetings have been held during Gate 2 to inform DWI of the scheme development and water quality assessment DWI supported the approach taken in developing the T2ST drinking water quality assessment.	Following support for the approach, the assessment activity has progressed and output will be shared at timely intervals
Initial engagement with the Local Planning Authorities (LPAs)	The LPAs provided initial comments on local points for consideration in the ongoing project work. This included comments on emerging Local Plans, T2ST future engagement with LPAs and communities, and opportunities for biodiversity net gain and synergistic planning with other infrastructure schemes. Specific points such as naming of sites/sources was noted.	Wider points will be considered in the development of the scheme. The T2ST has committed to further engagement post Gate 2.
Introductory briefing session with North Wessex Downs AONB	Planning issues relating to major development proposals within the AONB were discussed, including the potential corridors. The basis of decisions made to date to shortlist the corridors was understood. The AONB want to ensure routeing and siting is appropriate, and that emphasis is given to restoration proposals and mitigation of impacts.	The T2ST has committed to further engagement post Gate 2.
Interdependencies and co-design of infrastructure to future proof the schemes	Discussion of consenting Inter-relationships and consenting of connection infrastructure.	On-going engagement across the SROs to safeguard future schemes.

3. Engagement with customers

3.1. Summary of activity during Gate 1

3.1.1. The Gate 1 engagement[6] focused on examining customers' views on water resources planning – the challenges, the options, sharing resources and the strategic regional options including water transfers. The research highlighted the following:

- Support for collaboration on planning future water resources. Proposals to share water is generally seen in a positive light with recognition that collaborative planning and options can be efficient and fairer.
- A lower preference for water transfers than some other options such as reservoirs, which customers feel bring added value to the community. Furthermore there was a preference for self-reliance within the water company area over a perceived riskier strategy of long-term dependence on sources from outside the water company.
- In general, transfers via river or canal are considered to be more appealing than pipeline options because they are perceived by customers to have wider benefits and fewer negative impacts over the functional aspect of simply transferring water between locations.
- Main concerns for transfers include cost, disruption from construction, environmental impacts, energy use and lack of benefits to local communities as well as some concerns over the impact on them in terms of water quality, taste and hardness from receiving a 'different' source water.

3.2. Overview of Gate 2 engagement

3.2.1. Our Gate 2 activity has built upon the work completed in Gate 1. It has been undertaken in collaboration with other water companies, and SRO project teams, to ensure a consistent and efficient programme of customer engagement to support the development of all the SROs.

3.2.2. The work has focused on exploring some of the aspects raised at Gate 1 in more detail. There were four main components to our work:

- exploring, through the regional engagement, what customers view as 'best value' how they weight and prioritise aspects of best value
- how we can make schemes more acceptable to customers. One of the key issues for customers is the lack of understanding of what a transfer involves, concerns regarding potential disruption and perceived lack of wider social and environmental benefits. The research aimed to gain a deeper insight into public value – exploring with customers what they understand as public value, their preferences, whether their views alter dependent on their proximity to the scheme and how much they would be willing to pay for a range of possible 'added value' options for a scheme such as T2ST, and how this differs depending on the type of scheme.
- how customers perceive, understand and ultimately how we need to communicate when we change their source of water. We explored this immersively including taste testing and co-designed a communications framework which was then quantitatively tested with a wide range of customers.

[6] T2ST Gate 1 Submission, July 2021, Section 8

- consideration of wider insight gathered as part of company operations and long term planning.

3.2.3. To ensure transparency we involved WRSE's regional CCG in the work to explore the best value criteria, and for the SRO club projects we shared the research materials and findings through workshops with the technical teams involved and interested stakeholders including the DWI and CCW.

3.3. WRSE seeking customers' views on "Best Value"

3.3.1. WRSE commissioned an independent market research agency to explore with customers what they consider to be 'best value' in respect of planning future water resources, testing their views on best value criteria and metrics to be used to assess the performance of regional plans including the importance, or weights, that customers place on each. This research aimed to provide insight on the strength of customer preference for different aspects of a best value plan, as well as the trade-offs that customers are comfortable with when making choices between the enhancements, timings, and the bill impacts of alternative plans.

3.3.2. Over 300 household customers were engaged in this research. The criteria were grouped into 4 outcomes and the criteria were explained in a customer 'friendly' way. These are shown in Figure 3.

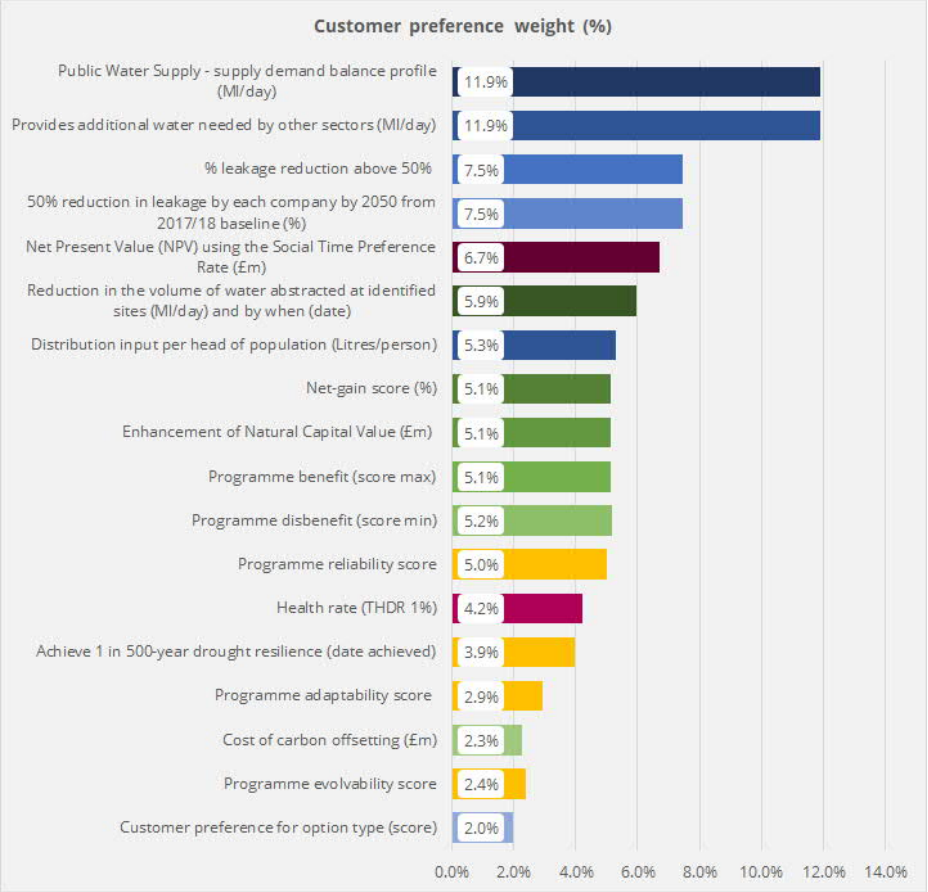
Figure 3 Best value outcomes and criteria

Best value outcomes	Criteria (Jan 21)
Deliver a secure and wholesome supply of water to customers and other users to 2100	• Meet the supply demand balance* • Leakage* • Water consumption • Non-public water demand • Customer preferences
Be deliverable at a cost that is acceptable to customers	• Programme cost • Intergenerational equity
Deliver long-term environmental improvement and social benefits	• Strategic Environmental Assessment • Natural Capital • Biodiversity • Abstraction reduction* • Carbon
Increase the resilience of the region's water systems	• Drought resilience* • Reliability • Adaptability • Evolvability

3.3.3. The output from the research is presented in Figure 4. In general, customers place more weight on the delivery of secure supply of water, followed by the cost of investments, environmental improvements, with resilience placed on the lower end of the scale. The outputs have been used in the investment modelling undertaken by WRSE to develop the best value plan.

3.3.4. The output is also helpful to consider in the design of the SROs and the prioritisation of additional aspects that the SROs could potentially deliver.

Figure 4: WRSE regional research to understand customers "weights" for best value criteria



3.3.5. The full report is included in Annex 2.

3.4. Exploring customers preferences for public or added value

3.4.1. This research study was undertaken as a "club project", a collaboration across 11 SROs. It aimed to:

- understand what added value customers perceive is important, as part of new water infrastructure development
- understand preferences for the added value, i.e. the balance between options such as economy, jobs, apprenticeships, leisure, education and carbon sequestration, etc
- determine if the preferences change, depending on the geographical location, type of scheme or other factors
- establish how much customers are prepared to pay
- determine the nature of the language we should use to explain the added value to customers

3.4.2. The research study comprised 3 components:

- desk review of guidance on public/added value and case studies involving the measurement of customer preferences for added value
- qualitative research with household and non-household customers across 24 groups to introduce the concept of public or added value and exploring what it means and what's important to customers. It provided a foundation of evidence on customer

preferences and attitudes, and the language that should be used to explain added value.
- qualitative research building on the learnings from the qualitative research and using choice experiment with over 5,900 household and 550 non-household customers.

3.4.3. The research was undertaken to ensure views from a representative cross section of customers were obtained, with the participating water companies providing guidance on appropriate customer segmentation. The findings will be used to inform the conceptual design of the scheme and if the scheme is taken forwards further work will be progressed with relevant organisations and communities who could be affected by the scheme as explained in section 4.

3.4.4. The qualitative research showed that the concept of "public value" needed to be explained, it is not a commonly used term but once the concept was understood the majority of people felt that it is important. However, most are 'contingent supporters' i.e. they need convincing that additional costs are justified particularly in the current economic climate. Furthermore, there are some additions that are common across projects for example economic and environmental benefits whilst customers' expectations differ according to the project type and different projects attract different levels of support.

3.4.5. The quantitative research indicated participants' willingness to pay (WTP) for a set of potential project additions in the context of the strategic resource options (SROs). The proposed additions are shown in Table 4.

Table 4 Descriptions of potential project additions

Project addition	Abbreviated description (report)
One in every 50 jobs created to develop the site will be an apprenticeship	One in every 50 jobs created will be an apprenticeship
A quarter of all employees working to develop the site will be recruited from the local area	A quarter of all employees are local
Increased visitor numbers, with economic benefits to the surrounding area	Increased visitor numbers, with economic benefits
Links to heritage and local history, through signs put up at the site.	Links to heritage and local history, through signs at the site
Space provided for eco -agricultural activities, including regenerative farming and re-wilding	Space provided for eco-agricultural activities
Irrigation reservoirs to improve local farmland	
Café with locally sourced food	
Fish ponds created, with public access.	
Visitor centre	
Shop selling sustainable products and gardening materials	
Outdoor BBQ/picnic facilities	
Water sports facilities, e.g. sailing, paddleboarding	
Land-based recreation/amenities, e.g. Go Ape, Segway hire, cycle hire	Land-based recreation/amenities
Restaurant/café/welfare facilities	
Wildlife viewing platform, Bird watching facilities	
Children's playground	
Sensory garden/space for those with learning difficulties	
Walking paths, Boardwalk, Bridleway and Cycle trail	
Beach area	
Campsite	
Conference centre	
Education/training/research facility	
Links to bus and rail stations	
Reduced flood risk to surrounding area	
New wetland area, with benefits for flood risk, wildlife habitats and carbon capture	New wetland area
Specialist habitats created for wildlife, including butterfly bank, wildlife refuge, ponded areas, reed beds, new woodland and meadow, and creation of landscape scale habitat corridors	Specialist habitats created for wildlife

3.4.6. There were five general principles identified namely, local community centric; long term value; sustainable; relevant and low maintenance.

3.4.7. For households the highest-valued project additions for sites that are 5 miles away from the home were:

- Specialist habitats created for wildlife (£3.87 annually)
- New wetland area (£3.24 annually)
- A quarter of all employees are local (£2.30 annually)

The average valuation of any project addition was highest in the environmental area, followed by project additions in the economic area and the social area. Noting that the WTP for a "package" of additions was lower than the sum over individual project additions indicating that capping may be needed.

3.4.8. The WTP for project additions at sites that are 50 miles from the home was, on average, 87% of the WTP for sites that are only 5 miles away.

3.4.9. For non-households, as for households, the average valuation of any project addition was highest in the environmental area, followed by project additions in the economic area and the social area. The combined valuation of all project additions was around 9% of the annual water only bill.

3.4.10. Specifically for water transfers by pipeline new wetland areas, wildlife viewing platforms, walking paths and cycle trails, and local employment were amongst the highest scoring project additions.

3.4.11. These research finding will inform the next stages of design for the T2ST transfer scheme and what additional investment could be incorporated into the design to provide wider environmental and social benefit. It will be important in the next stages of engagement and consultation that the design is considered by the local communities who could be affected and that their feedback is used to help to inform future design.

3.4.12. The full report of the research study is provided in Annex 3.

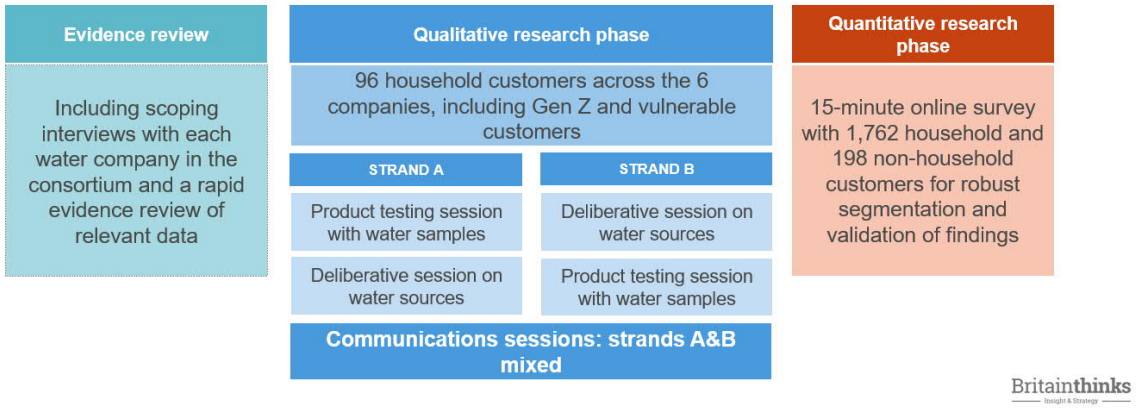
3.5. Changing water sources

3.5.1. This was a collaborative "club" project across 11 of the Strategic Resource Options (SROs) with the aim of understanding customers' views on changing their water source. It comprised three stages of research:

- a review of existing evidence to understand attitudes towards water source change
- a qualitative phase to explore customers' views about water resource options, taste tests using samples representing a range of source options and engagement on how to communicate changes to water sources for each option type including content, tone of voice, timing and format. 96 household customers were engaged in this phase.
- quantitative testing of draft communications using different framings – environmental, human and practical. 1,762 household customers and 198 non-household customers were engaged during the quantitative phase.

3.5.2. The methodology is summarised in Figure 5.

Figure 5 : Summary of the approach taken for the changing sources customer research



3.5.3. The key findings were:

- Water is a low salience topic, with customers indicating a low level of awareness and understanding of issues relating to it. This, in part, is driven by general satisfaction with the customer experience of water, in terms of taste, smell and hardness.
- Customers also have low awareness of water scarcity, and, whilst all take steps not to 'waste' water, most are not actively trying to reduce their water consumption. Information on the topic is easily understood, however, this is not always enough to unseat long-standing perceptions that water is abundant in the UK.
- Customers believe that water companies should be taking steps to respond to the issue of water scarcity now and recognise that a mix of demand and supply-side solutions are required. However, there is a general desire to see water companies implement demand-side options first, including fixing leaks and educating customers.
- Customers say they are unlikely to engage with communications on source change, and taste tests indicate that most are not able to detect differences at the level that might be expected in a source change. However, there is still a need to communicate to explain the rationale for the change, alleviate taste concerns and provide clear guidance on the impact.
- In terms of communication, the 'human', or more personal, frameworks best.
- Most household customers want initial notification three to six months in advance of the change, although non-household customers are more likely to want an earlier notification of a change. Most respondents then want to be reminded again of the change, at a point closer to the time, but generally only once.
- An email message and a letter, separate from the water bill, are the preferred forms of communication about source changes, consistent across sources. Most customers claim they would click through to look at additional information. Whilst, this number may be lower, providing comprehensive information to those who may want it is key.
- Of those who are more inclined to visit a website for further detail on the change, there is an expectation that this would include a wealth of comprehensive information. This includes detail on bills, taste, the process, the reason behind the change, safety, environmental impact, and information from an independent source.

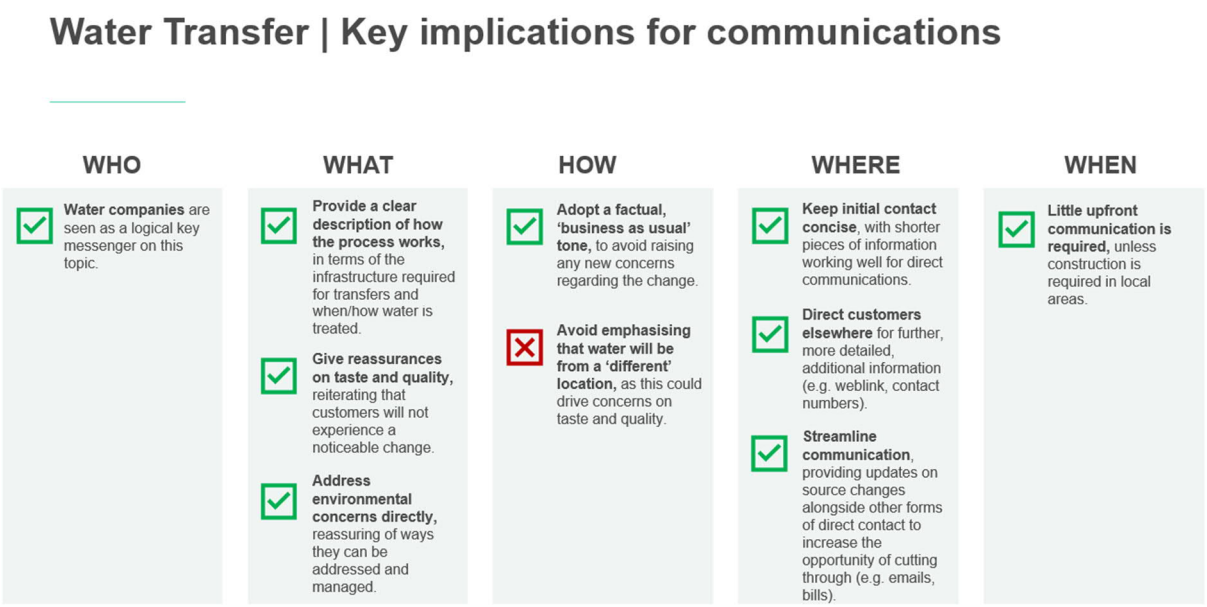
3.5.4. Specifically in respect of water transfers the concerns arise from comprehension issues and worries about quality and the environmental impact:

- Comprehension: Many customers struggle to understand the logistics and infrastructure required for water transfer and so find the specifics difficult to grasp.
- Quality: Customers have some sense that the taste or characteristics of their water may change if it is coming from a different area of the country, and worry that this water will be 'worse' in quality.
- Environment: Customers are concerned that environmental impacts, such as the potential disruption of natural habitats, will be managed.

3.5.5. The product sample tasting reassured customers that water transferred from other areas will not necessarily taste noticeably different from what they are used to.

3.5.6. A summary of what's needed regarding future communications for a water transfer is shown in Figure 6.

Figure 6 Communicating with customers on a future water transfer



3.5.7. A communications framework, which took all the learning from the research, has been produced as a practical tool to use when a change to customers' water source is required including the language, framing and timings of communications. This is included in the research report which is presented in Annex 4.

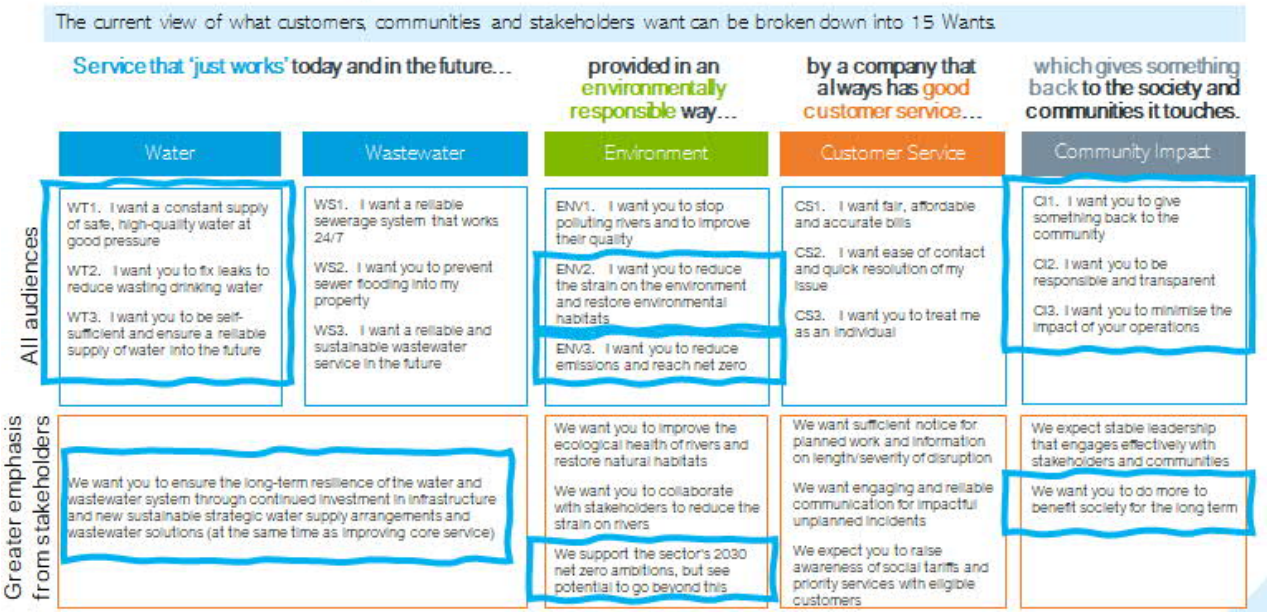
3.6. Wider research evidence – water companies

3.6.1. Thames Water has collated customer, stakeholder and community insights[12] to consolidate what we know about the needs and expectations of our customers and to provide a robust evidence base to inform decision making for strategic and business planning. A summary of the insight, relevant to water resources, is included here alongside the specific water resources and SRO research and reconfirms the priorities

and preferences of customers. Note the work reported here is a point in time and will continue to be extended and refined with further insights.

3.6.2. The top "15" wants are presented in Figure 7, with those most relevant to water resources and planning long term future water supply highlighted.

Figure 7 Thames Water consultation insights on customer "wants"



3.6.3. Aspects highlighted which are specifically relevant to the ongoing development of SROs, are the following:

- Reduce the strain on the environment and restore environmental habitats
- Reduce emissions and reach net zero – plus increase the use of green energy and generate more renewable energy without increasing costs
- Work with, and give something back to the community – undertake corporate responsibility activities; engage in local issues and provide more access to sites for recreation and minimise the impact of our operations

3.7. Working openly and transparently

3.7.1. The process of collaboratively delivering our customer engagement activity has been driven through the WRSE Engagement and Communications Board (for regional work) and steering groups formed by the SRO companies for each project.

3.7.2. We have benefited from a wide range of expertise with the participating company's insight, regulation and water resources teams to help the design and development of the engagement activities both ensuring best practice and alignment to wider insight activities to inform the PR24 business planning activities. The work was delivered by independent market research agencies compliant with the MRS code of conduct.

3.7.3. In addition, WRSE has facilitated a regional Customer Challenge Group (rCCG), bringing representatives from the Consumer Council for Water (CCW) and the company independent challenge groups to share and input on the approaches and materials used to engage customers. We also have shared briefs and materials for the research with both CCW and the DWI for comment have been engaged as part of the collaborative research activities.

4. Next steps

4.1.1. There will be ongoing engagement with the stakeholder community as part of the development of the SE regional plan and consultations on the draft regional plan and draft WRMP24s in Autumn 2022. The engagement will include statutory consultees as well as organisations who have an interest in future water resources be it from a strategic perspective or a more specific perspective with interest in a topic, local watercourse or a specific scheme.

4.1.2. We will continue engagement to ensure the technical assessments draw on the detailed technical knowledge of specialists and experts. These include:

- RAPID on the programme of work, articulation of issues and risks, and the delivery of outputs to sufficient quality and time demonstrating efficient spend.
- EA, NE and DWI, as well as stakeholder organisations, represented on the Technical Liaison Groups to ensure the further work is robust and the approach takes account of constraints, as well as opportunities.
- 1-2-1 engagement with strategic and specialist stakeholders to ensure the ongoing technical studies are robust and based on the most up-to-date data and assessment methods

4.1.3. We will explore opportunities for wider social, economic, and environmental benefits, beyond providing a resilient and sustainable water resource. We will continue, and extend, the engagement to share, and seek input to, the design of the scheme including opportunities for partnership working to enhance the wide potential benefits and mitigate as far as possible issues. This engagement will include organisations such as:

- Wildlife Trusts and County and District ecologists to discuss potential biodiversity benefits through scheme design.
- Local government, community, education, economic and growth organisations to discuss opportunities for amenity and recreation, education, local employment and skill creation.

4.1.4. An engagement strategy will be developed. The timings will be determined by the path that the regional plan and WRMPs take, as such it is not possible to commit to a definitive timetable at this stage.

4.1.5. There is no foreseen need for any further specific customer research / insight to inform Gate 3 plans for T2ST, the focus will move from gathering customer insight into community consultation and engagement.

Annexes

Annex 1: Overview of engagement to inform the development of the SE plan

Date	Stakeholder group/activity	Agenda/Discussion topics
2021		
January (20)	Multi-sector group	Review of non-Public Water Supply (PWS) demand long-term forecast, review of potential impact of updated EA forecasts on abstraction.
February (12 & 16)	Best Value (BV) Plan consultation webinar 75 attendees	Presentation, discussion and Q&A on the BV Plan objectives, criteria, and metrics to support the consultation
February (22)	Stakeholder Advisory Board (SAB)	Introduction to refreshed terms of reference and work programme; update on the BV planning approach.
March (2)	Environmental Destination workshop – regulators and EAG technical advisors	EA presentation on proposed abstraction reduction scenarios and application of this; Development of catchment portfolios.
March (8)	Environmental Advisory Group (EAG)	Focus on environmental destination; BV planning – criteria and metrics; Catchment options and delivery mechanisms
March (17)	Multi-Sector group (MSG)	Overview of position for each sector
March (25)	Thames Water & Affinity Water Water Resources Forum	Best Value planning consultation – feedback – next steps for engagement with customers and stakeholders; update on SE planning challenge
May	Future Water Resource Requirements	Publication setting out the planning challenge for the SE
May (18)	Stakeholder Advisory Board (SAB)	Workshop to consider the engagement with customers and stakeholders on alternative plans and the development of an interactive tool to clearly communicate the information.
May/June	Options - overview of the options considered in the SE plan	Series of workshops organised by option type to showcase the range of options under consideration and provide an opportunity to discuss and comment on the options.
May	Agriculture/horticulture working group	Review of opportunities for shared options with agricultural and horticultural stakeholders
June	Multi-Sector (MS) group	Update on the modelling work and discussion on the next steps for agriculture/horticulture shared options
July	Webinar for Retailers	Focus on the company drought plan consultations and introduced the regional plan
September	Environmental Advisory Group (EAG)	Focus on the environmental destination for the SE
September	Agriculture/horticulture working group	Ongoing discussion on opportunities for shared options with agricultural and horticultural stakeholders
September	Multi-Sector (MS) group	Update on the modelling work and discussion on the next steps for agriculture/horticulture shared options
September	Regional reconciliation webinar	Recap on role of regional planning, overview of reconciliation process and updates from regional groups
October	Stakeholder Advisory Board (SAB)	Focus on the adequacy of the approach to ensure stakeholder and customer views are considered in the development of the plan.
November	Horticultural Trades Association	Briefing on the emerging plan
November	Council for Protection of Rural England (CPRE)	Briefing on the emerging plan
November	Thames Water & Affinity Water Water Resources Forum	Update on work to develop the regional plan, with a focus on the SROs
December	National Farmers Union (NFU)	Briefing on the emerging regional plan
December	CCW	Briefing on the emerging regional plan
December	Blueprint for Water	Briefing on the emerging regional plan
December	South East Rivers Trust	Briefing on the emerging regional plan
January	National Infrastructure Commission	Briefing on the emerging regional plan
January (13)	Oxfordshire County Council & Vale of White horse District Council members and officers	Pre-consultation briefing event

January (17)	Wide stakeholders > 270 attendees	National Framework led webinar on the national water resource picture including a summary of each regional group's regional plan.
January (20)	Wide stakeholders > 160 attendees	Launch of the consultation on the emerging regional plan for the SE
January (31)	Wide stakeholders	SE (West region) launch webinar
February (1)	Wide stakeholders	SE (East region) launch webinar
February (2)	Wide stakeholders	SE (North region) launch webinar
March (1)	Wide stakeholders	Live consultation Q&A
March (1)	Stakeholder Advisory Board (SAB)	Discussion on the consultation feedback and next steps
March (3)	Environmental Advisory Group (EAG)	Environmental ambition & prioritisation
March (5)	Community Drop-in, Steventon, Oxon	A drop in event to enable the local community to engage with TW, Affinity and SESRO team
April (28)	Environmental Advisory Group (EAG)	Overview of updated environmental ambition for all SE companies
May (20)	Environmental Advisory Group (EAG)	Ongoing discussion on environmental ambition and prioritisation
June (7)	Thames Water & Affinity Water Water Resources Forum	Overview of responses to the consultation and work to transition to the best value regional plan
July (11)	EAG, SAB and MS Group joint workshop	Review alternative programmes to inform the preferred draft plan for consultation

Annex 2 WRSE Research to test customer preferences for best value outcomes, Eftec, May 2021

Annex 3 Customer preferences on added value for large resource schemes, Accent and PJM economics, August 2022

Annex 4 Water club: Changes of source, Britainthinks, June 2022

Best Value Criteria – Customer Research

Final Report

Water Resources South East

May 2021

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Disclaimer

Document evolution

Final Report	28/05/21	

Summary

Introduction

The WRSE regional plan will set out the actions and investments – including measures to reduce leaks, help households and businesses save water, and increase the amount of water available for supply - that are needed from 2025 to 2100, to ensure there is a secure water supply system for all customers in the South East of England. The plan will take into account expected population growth, changes in climate, and extreme events such as sustained periods of drought, and will form the basis of the six WRSE companies individual water resource management plans (WRMP).

In developing the regional plan, WRSE needs to find the right balance across a combination of regulatory requirements – including reducing the risk emergency drought measures to 1-in-500 for any one year and taking less water from sensitive river habitats – and discretionary enhancements relating to the extent to which the plan builds in 'insurance' and flexibility to cope with disruption and extreme weather events and how much it aims to further reduce water use by households and businesses. One way in which WRSE will assess these choices and associated trade-offs in terms of outcomes for customers and the environment is by comparing the performance of alternative candidate plans against a set of 'best value criteria' (Table S.1), which follow recent UKWIR guidance[1]. The criteria reflect a range of outcomes and benefits associated with an enhanced plan over the least cost approach to delivering the minimum planning requirements (the 'least cost plan'), including resilience, environmental impacts, biodiversity, and wider socio-economic and customer benefits.

The objective of this study was to conduct quantitative research to provide customer preference weights for the WRSE best value criteria. The research was implemented through a representative online survey of household customers in the South East, with 309 respondents representing all six WRSE companies completing the survey. A choice modelling approach was used to estimate the preference weights for the best value criteria.

Table S.1: WRSE best value planning criteria

Outcome	Value criteria	Metric
Deliver a secure supply of water to customers and other sectors to 2100	Meet the supply demand balance	Public Water Supply - supply demand balance profile (Ml/day)
		Provides additional water needed by other sectors (Ml/day)
	Leakage	50% reduction in leakage by each company by 2050 from 2017/18 baseline (%)
		% leakage reduction above 50%

[1] UKWIR (2020) Deriving a Best Value Water Resources Management Plan.

Outcome	Value criteria	Metric
	Water consumption	Distribution input per head of population (Litres/person)
	Customer preference	Customer preference for option type (score)
Deliver environmental improvement and benefits to society	Strategic Environmental Assessment (SEA)	Programme benefit (score max)
		Programme disbenefit (score min)
	Natural capital	Enhancement of Natural Capital Value (£m)
	Abstraction reduction	Reduction in the volume of water abstracted at identified sites (Ml/day) and by when (date)
	Biodiversity	Net-gain score (%)
	Carbon	Cost of carbon offsetting (£m)
Increase the resilience of the region's water systems	Drought resilience	Achieve 1 in 500-year drought resilience (date achieved)
	Resilience assessment - reliability	Programme reliability score
	Resilience assessment - adaptability	Programme adaptability score
	Resilience assessment - evolvability	Programme evolvability score
Delivered at a cost that is acceptable to customers	Programme cost	Net Present Value (NPV) using the Social Time Preference Rate (£m)
	Intergenerational equity	Health rate (THDR 1%)

Source: WRSE (2021) Developing our 'Best Value' multi-sector regional resilience plan, A consultation on our objectives, value criteria and metrics, February 2021.

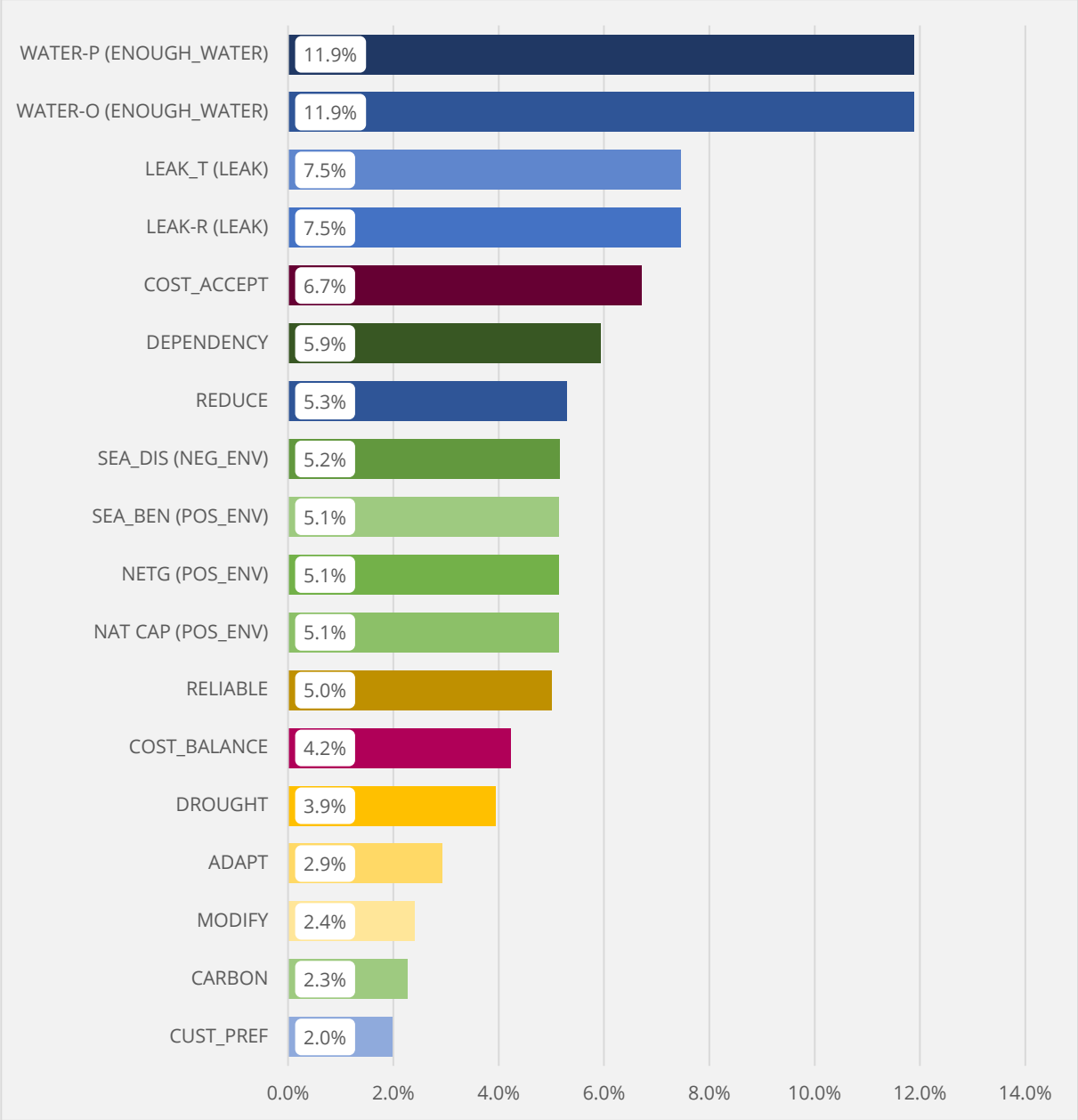
Results

The main results are reported in Figure S.1. They indicate the following "tiering" of customers' priorities for the regional plan outcomes:

- **Top priorities**: foremost to ensure the long-term security of supply in the region, both for public supply purposes and other sectors. Ranking just below this are the key considerations for improving the efficiency of the water supply system in terms of reducing leakage and reducing its dependency on sensitive habitats and groundwater sources, along with the cost and customer affordability constraints for the plan.
- **Mid-tier priorities**: feature several dimensions of the performance of the plan relating to wider environmental impacts, reducing demand for water, and improving resilience to extreme events.
- **Lower priorities**: include wider aspects of the resilience of the water supply system, including minimising the risk of emergency drought restrictions, along with balancing the carbon impact and the mix of options used.

Overall respondent feedback on the survey was positive, indicating that there was a good level of understanding of the best value criteria and the choice task exercise. Overall, the study results are judged to be robust and fit-for-purpose for use in WRSE's investment modelling process.

Figure S.1: Customer preference weights for best value criteria



Label	Metric	Criteria
CUST_PREF	Customer preference for option type	Customer preference
CARBON	Cost of carbon offsetting	Carbon
MODIFY	Programme evolvability score	Resilience assessment - evolvability
ADAPT	Programme adaptability score	Resilience assessment - adaptability
DROUGHT	1 in 500-year drought resilience	Drought resilience
COST_BALANCE	Health rate (THDR 1%)	Intergenerational equity
RELIABLE	Programme reliability score	Resilience assessment - reliability
NAT CAP (POS_ENV)	Enhancement of natural capital value	Natural capital
NETG (POS_ENV)	Net-gain score	Biodiversity
SEA_BEN (POS_ENV)	Programme benefit (score max)	Strategic environmental assessment
SEA_DIS (NEG_ENV)	Programme disbenefit (score min)	
REDUCE	Distribution input per head of population	Water consumption
DEPENDENCY	Reduction in the volume of water abstracted at identified sites	Abstraction reduction
COST_ACCEPT	Net present value using the social time preference rate	Programme cost
LEAK-R (LEAK)	Percentage leakage reduction above 50%	Leakage
LEAK_T (LEAK)	50% reduction in leakage by 2050	
WATER-O (ENOUGH_WATER)	Provides additional water needed by other sectors	Meet the supply demand balance
WATER-P (ENOUGH_WATER)	Public water supply - supply demand balance profile	

Contents

1. Introduction

1.1 Background

Water Resources South East (WRSE) is an alliance of the six water companies that supply the South East region of England. In collaboration with other stakeholders, WRSE is developing the South East's regional resilience plan. The multi-sector plan will cover water resource planning needs for public water supply and other users for the period 2025-2100 with the aim to deliver "*the best value to customers, society and the environment… to secure long-term resilience*"[2].

The regional plan will set out the actions and investments – such as measures to reduce leaks, help households and businesses save water, and increase the amount of water available for supply - that are needed from 2025 to 2100, to ensure there is a secure water supply system for all customers in the region. The plan will take into account expected population growth, changes in climate, and extreme events such as sustained periods of drought, and will form the basis of each company's own individual water resource management plan (WRMP). It also provides the wider planning context in which large-scale integrated solutions are being developed as Strategic Resource Options (SROs) by collaborative groups of companies and stakeholders.

As a minimum, the plan will aim to deliver on the objectives set out in the National Framework for Water Resources[3]. This includes: reducing the risk emergency drought measures to 1-in-500 for any one year; taking less water from sensitive river habitats; reducing leakage by 50% of current levels by 2050; measures to help customers save water; and working with manufacturers and builders on water efficiency standards. Beyond the minimum requirements several areas for discretionary enhancements to the plan are being considered by WRSE. This includes: the extent to which it is adaptable and builds in 'insurance' and flexibility to cope with disruption and unexpected events (e.g. flooding); whether it seeks to further reduce the dependency of the water system of the environment beyond statutory requirements; and how much it aims to further reduce water use (e.g. in line with proposed targets for per capita consumption).

WRSE needs to find the 'right' balance across these discretionary choices as part of the process of determining the best value plan for the region. One way in which WRSE will assess these choices and associated trade-offs in terms of outcomes for customers and the environment is by comparing the performance of alternative candidate plans against a set of 'best value criteria', which follow recent UKWIR guidance[4]. The criteria reflect a range of outcomes and benefits associated with an enhanced plan over the least cost approach to delivering the minimum planning requirements (the 'least cost plan'), including resilience, environmental impacts, biodiversity, and wider socio-economic and customer benefits. Within this, there is a role for customer research to understand the weight and priority to place on the outcomes represented by the best value criteria, which in turn will influence the balance of the regional plan.

[2] WRSE (2020) Future water resource requirements for South East England. March.
[3] Environment Agency (2020). Meeting our future water needs: a national framework for water resources.
[4] UKWIR (2020) Deriving a Best Value Water Resources Management Plan.

1.2 Research aim

The objective of this study was to conduct quantitative customer research to provide customer preference weights for the WRSE best value criteria (BVC) (Table 1.1). The results – the quantified customer preference weights - are an input to the WRSE investment modelling process.

The BVC represent the range of factors – beyond just financial cost – that are being taken into account in the investment modelling process that will determine the preferred plan for the South East. The approach is essentially a form of multi-criteria decision analysis (MCDA) that tests the performance of candidate plans across a set of monetised and non-monetised impacts - as represented by the BVC - as part of the process of identifying the preferred plan.

Table 1.1: WRSE best value planning criteria

Outcome	Value criteria	Metric
Deliver a secure supply of water to customers and other sectors to 2100	Meet the supply demand balance	Public Water Supply - supply demand balance profile (Ml/day)
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	Leakage	50% reduction in leakage by each company by 2050 from 2017/18 baseline (%)
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	Water consumption	Distribution input per head of population (Litres/person)
	Customer preference	Customer preference for option type (score)
Deliver environmental improvement and benefits to society	Strategic Environmental Assessment (SEA)	Programme benefit (score max)
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	Biodiversity	Net-gain score (%)
	Carbon	Cost of carbon offsetting (£m)
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	Resilience assessment - reliability	Programme reliability score
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	Resilience assessment - evolvability	Programme evolvability score
Delivered at a cost that is acceptable to customers	Programme cost	Net Present Value (NPV) using the Social Time Preference Rate (£m)
	Intergenerational equity	Health rate (THDR 1%)

Source: WRSE (2021) Developing our 'Best Value' multi-sector regional resilience plan, A consultation on our objectives, value criteria and metrics, February 2021.

The customer research was implemented as an online survey with a representative sample of customers in the South East, with coverage of all six WRSE companies. A choice modelling approach was used to quantify the relative importance (weight and priority) customers place on the BVC.

1.3 Report structure

The remainder of this report is structured as follows:

- **Section 2** outlines the research methodology, including the survey design, content and sampling approach;
- **Section 3** presents the main results, covering the sample profile, customer preference weights, and respondent feedback; and
- **Section 4** summarises key findings.

The main report content is supported by three appendices:

- Appendix A: Customer survey
- Appendix B: Best value criteria mapping to choice task attributes
- Appendix C: Customer preference weights for best value criteria

2. Methodology

2.1 Survey design and testing

The initial content and material for the online survey was developed from the preceding quantitative customer research for WRSE carried out in October – November 2020[5]. This previous research included the design, testing and implementation of a survey that provided customer preference weights for supply and demand options for the regional plan. Relevant content from the previous survey was retained - including the "scene-setting" explanatory information for respondents, along with screening / quotas question, household profile questions, and appropriate respondent feedback questions – allowing the upfront survey development and testing work to focus on respondent understanding of the best value criteria (BVC) and the specification of the customer preference exercise.

Design and testing

The content and materials for the survey were tested via an online bulletin board exercise with a group of household customers recruited from across the WRSE region (13 participants in total). The group featured a good mix of customers from differing demographic and socio-economic backgrounds. Exercises included asking participants to comment on the clarity and ease of understanding of BVC and the subsequent descriptions that were developed, along with ranking the BVC from "most important" to "least important" in terms of the outcomes the plan should achieve. Example materials are shown in Figure 2.1.

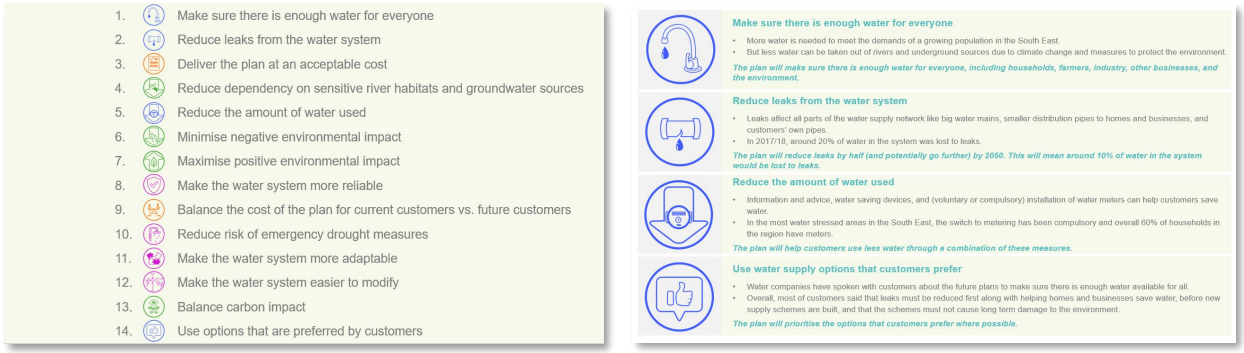


Figure 2.1: Example materials from customer testing

Participants generally found the BVC clear and easy to understand, which provided a clear starting point for further developing their descriptions in the survey materials. In terms of the ranking exercise, the two most important outcomes / constraints were "make sure there is enough water for everyone" and "reduce leaks from the water system". Conversely, the lowest priority outcomes / constraints were "net zero carbon impact" and "use water supply options that customers prefer".

Following the participant feedback, improvements to the survey materials included refining BVC definitions and designing the format and layout of the survey showcards to have headline information on the front of the card with a "rollover" on the flipside with more information (Figure 2.2).

[5] eftec and ICS Consulting (2021) Customer Preferences to Inform Long-term Water Resource Planning - Part C Customer Survey, Report for Water Resources South East (WRSE), March 2021.

Figure 2.2: Final choice cards in the survey format (left is front of the card, right flipside)

The survey content was also reviewed by the WRSE ECB. This is included the descriptions for the best value criteria and wider elements of the survey including the visual presentation and supporting explanation of the WRSE regional plan. Representatives from the companies' Customer Challenge Group (CCG) were also engaged as part of the survey design and reporting phases.

Pilot survey

The survey was pilot tested with an online "soft launch" with 46 respondents to check length and time to complete and ensure that the routing of the survey and data collection were functioning correctly. No amendments to the survey were made following the soft launch.

2.2 Survey structure and content

Survey outline

The structure of the customer survey is set out in Table 2.1. Appendix A provides the full survey script and showcards for reference.

Table 2.1: Survey structure

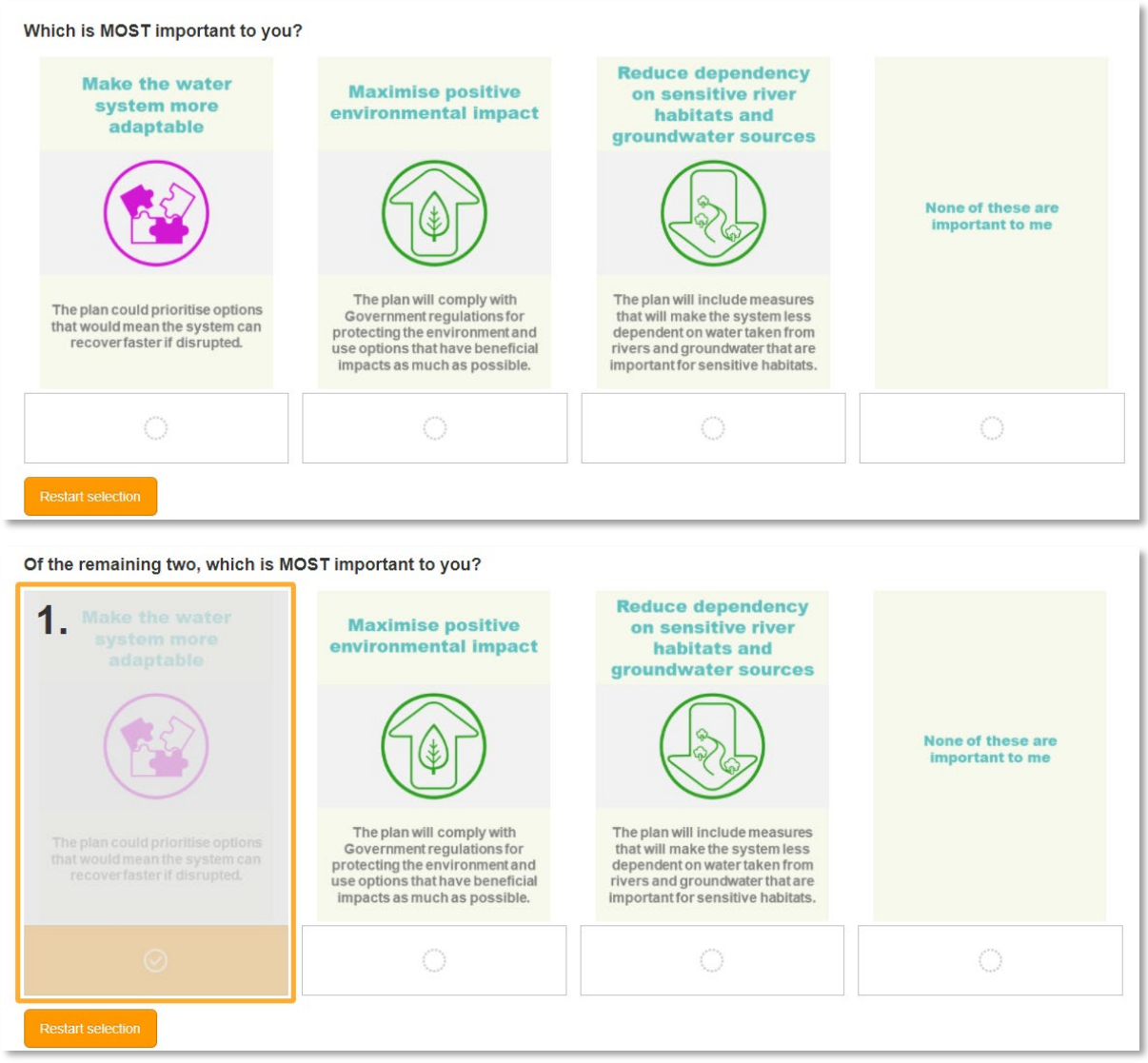
Section	Content
Introduction	• Introduction to WRSE and purpose of survey
Section A: Respondent screening and quotas	• Respondent screening: location
	• Respondent quotas: age, gender, socio-economic group, water company
Section B: Value criteria	• Explanatory information about the WRSE regional plan • Value criteria • Choice task exercise (best-worst scaling with progressive choice format), including instructions • Initial follow-up questions on ease/difficulty of choices and most/least important factors (value criteria)
Section C: Follow-ups	• Attitudes to long-term planning issues
Section D: Respondent profile	• Socio-economic and demographic profile (household size, employment, education etc.) Disability, Priority Services Register (PSR)
Survey close	• Survey feedback • Link to additional information on PSR
	• Thank and close

Customer preference exercise

Customer preferences for the WRSE best value criteria were elicited via a best-worst scaling (BWS) choice task[6]. This is a stated preference method that is a suitable format for producing customer preference weights that can be used in investment modelling – such as the process underpinning the development of the regional plan by WRSE.

In the choice task, respondents were asked to consider different combinations of the "factors" (the value criteria) that WRSE are balancing in producing the regional plan. In each case respondents were presented with three of the best value criteria and asked to select which factor was most important – i.e. the priority for the regional plan – and then of the remaining two, which factor was most important. Respondents answered 14 choice questions in total. A statistical experimental design was used to determine the combinations of the factors respondents saw in each choice, with the design ensuring that across the sequence of repeated choices each respondent saw each value criteria at least once. Figure 2.1 shows the onscreen appearance of the choice task exercise.

Figure 2.3: Customer preference exercise layout – progressive choice format



[6] See Louviere, J.J., Flynn, T.N. and Marley, A.A.J (2015) *Best-Worst Scaling: Theory, Methods and Applications*, Cambridge University Press.

The layout and appearance were developed and refined in the survey design and testing phase. Respondents were presented with the "label" for the factor, an accompanying icon, and short description of the factor – appearing onscreen as a card. As per Figure 2.2, additional information on the factor was provided via a rollover function, which flipped the card over. Prior to starting the choice task, respondents were provided with a set of instructions in the form of an animated gif that explained: (i) the key information shown on screen for each choice; (ii) how to display the additional information for each factor; and (iii) how to select the most important factor, and then the most important factor from the remaining two.

The choice task used a progressive choice format, asking for: (a) most important from the three factors; and then (b) most important from the two remaining factors[7]. This provides a full preference ranking for each combination of factors and across the full sample a rich dataset on the relative importance of the value criteria to support the estimation of customer preference weights.

Choice task attributes (best value criteria)

The WRSE best value criteria (Table 1.1) were formulated into 14 "attributes" for the choice task (the factors for balancing the plan as described above). The main focus was to prepare non-technical descriptions of the criteria that were clear and understandable for respondents, in terms of the objective for the regional plan – whether this was an outcome (e.g. reduce risk of emergency drought restrictions) or a constraint (e.g. affordability). Some best value criteria were merged where there was considerable overlap from a customer understanding perspective – namely strategic environmental assessment (max. score and min. score) and natural capital value, which was reduce to two attributes labelled as "maximise positive environmental impact" and "minimise negative environmental impact".

Table 2.2 presents the non-technical descriptions of the best value criteria presented in the choice tasks, detailing the: (i) attribute labels; (ii) a short description of the factor; and (iii) additional information shown on the flip side of the attribute card. The full mapping between the WRSE BVC (Table 1.1) and the choice tasks attributes (Table 2.2) is provided in Appendix B for reference.

[7] An alternative approach would be to use the conventional best-worst response format, asking respondents of the three factors shown, which was most important, and which was least important – this is also the basis of a max-diff type exercise which can also be used in quantitative research with customers. The progressive choice format was used, however, as this was judged to be easier for respondents complete, requiring them to pick the most important factor only in a given choice, rather than also requiring them to explicitly think about what was least important.

Table 2.2: Choice task attribute descriptions

Attribute label and description	Additional information
Make sure there is enough water for everyone The plan will make sure there is enough water for everyone, including households, farmers, industry, other businesses, and the environment.	• More water is needed to meet the demands of a growing population in the South East. • But less water can be taken out of rivers and underground sources due to climate change and measures to protect the environment.
Reduce leaks from the water system The plan will reduce leaks by half (and potentially go further) by 2050. This will mean around 10% of water in the system would be lost to leaks.	• Leaks affect all parts of the water supply network like big water mains, smaller distribution pipes to homes and businesses, and customers' own pipes. • In 2017/18, around 20% of water in the system was lost to leaks.
Reduce the amount of water used The plan will help customers use less water through a combination of measures.	• Information and advice, water saving devices, and (voluntary or compulsory) installation of water meters can help customers save water. • In the most water stressed areas in the South East, the switch to metering has been compulsory and overall 60% of households in the region have meters.
Use water supply options that customers prefer The plan will prioritise the options that customers prefer where possible.	• Water companies have spoken with customers about the future plans to make sure there is enough water available for all. • Overall, most of customers said that leaks must be reduced first along with helping homes and businesses save water, before new supply schemes are built, and that the schemes must not cause long term damage to the environment.
Maximise positive environmental impact The plan will comply with Government regulations for protecting the environment and use options that have beneficial impacts, as much as possible.	• Some options that save or supply water can have positive environmental impacts. • This includes helping to protect wildlife and creating new habitats, improving river quality, reducing risk of flooding and air pollution, and providing wider benefits for local communities (e.g. recreation sites).
Minimise negative environmental impact The plan will comply with Government regulations for protecting the environment and avoid or minimise negative impacts, where possible.	• The different options to supply water can have negative environmental impacts. • This includes loss of habitats, landscape and visual impacts from construction, new buildings and infrastructure, and emissions from operation of sites.
Reduce dependency on sensitive river habitats and groundwater sources The plan will include measures that will make the system less dependent on water taken from rivers and groundwater that are important for sensitive habitats.	• Some rivers and groundwater sources in the South East are important for protecting habitats for wildlife and plants that are sensitive to drought. The habitats can be badly damaged if too much water is taken out for homes and businesses. • Government regulation is reducing the amount of water that can be taken from these sources to protect sensitive habitats and help them cope better with the effects of climate change.
Net zero carbon impact from the plan The plan will ensure that the carbon impact is neutral by balancing the unavoidable emissions with savings elsewhere.	• The water industry has committed to achieving net-zero carbon by 2030. • Low carbon approaches can be used to minimise the amount of carbon emitted by the plan and unavoidable emissions can be "offset" by buying carbon credits created by carbon saving projects outside the water sector.

Attribute label and description	Additional information
Reduce the need for emergency drought measures The plan will reduce the likelihood of needing emergency drought measures, from currently 1 in 200 in any one year (about 40% chance over a person's lifetime) to 1 in 500 (about 16% chance in a lifetime).	• Consecutive years with drier than usual weather could lead to an extreme period of drought. If this happens, emergency measures would be needed to maintain the essential supply of water in the region (e.g. washing, toilet flushing and drinking). • These measures would be very disruptive for households and some businesses as water would be available only a few hours a day or would need to be collected from standpipes or tanks.
Make the water system more reliable The plan could prioritise options that would make the system more reliable and less likely to be disrupted by extreme events.	• The water supply system can be disrupted by events like heatwaves, extreme cold snaps, and floods which put pressure on supplies and can result in water shortages. • Some water supply options would ensure there is a "buffer" in the system so that events like this have less chance of causing water shortages.
Make the water system more adaptable The plan could prioritise options that would mean the system can recover faster if disrupted.	• The water supply system can be disrupted by events like heatwaves, extreme cold snaps, and floods which put pressure on supplies and can result in water shortages. • Some options would ensure that the system can recover faster from these events - for example by connecting different areas together so that water can be moved around the system more easily.
Make the water system easier to modify The plan could prioritise options that would make it easier for the system to cope with future changes.	• Future needs for water cannot be predicted fully because of uncertainty about population growth and the impacts of changing climate. • Some options will make it easier to increase the water supply gradually over time, for example by allowing extra supply to be added only when needed.
Deliver the plan at an acceptable cost The plan will look at different combinations of investment options to see what can be delivered for different levels of change in customer bills.	• A large part of the plan will be paid for by customers through their water bills. • The investment is needed for new water supply schemes, measures to save water, fix leaks, and protect the environment.
Balance the cost of the plan for current customers vs. future customers The plan will look to balance the cost of the plan across current and future customers (i.e. how much to spend now and how much to spend later).	• The plan will impact customer bills from 2025 to 2100 and beyond. The investment paid for by current customers will provide benefits for a long time. • There are different ways that the plan can be funded to spread the cost over time.

2.3 Sampling approach

Sampling quotas for the online survey were specified based on criteria agreed with the WRSE ECB: (i) gender; (ii) age; and (iii) socio-economic group (SEG). The quota targets were specified according to ONS Census data for the South East of England (Table 2.3).

Table 2.3: Sampling quotas (household customers)

Quota		Percentage of respondents (%)
Gender*	Female	50%
	Male	50%
	Total	**100%**
Age*	16-18	4%
	19-24	9%
	25-30	11%
	31-44	26%
	45-54	17%
	55-64	14%
	65+	19%
	Total	**100%**
Socio-economic group (SEG) **	SEG AB	29%
	SEG C1	32%
	SEG C2	18%
	SEG DE	21%
	Total	**100%**

Source: * ONS Population estimates (mid-2019), ** ONS Census (2011).

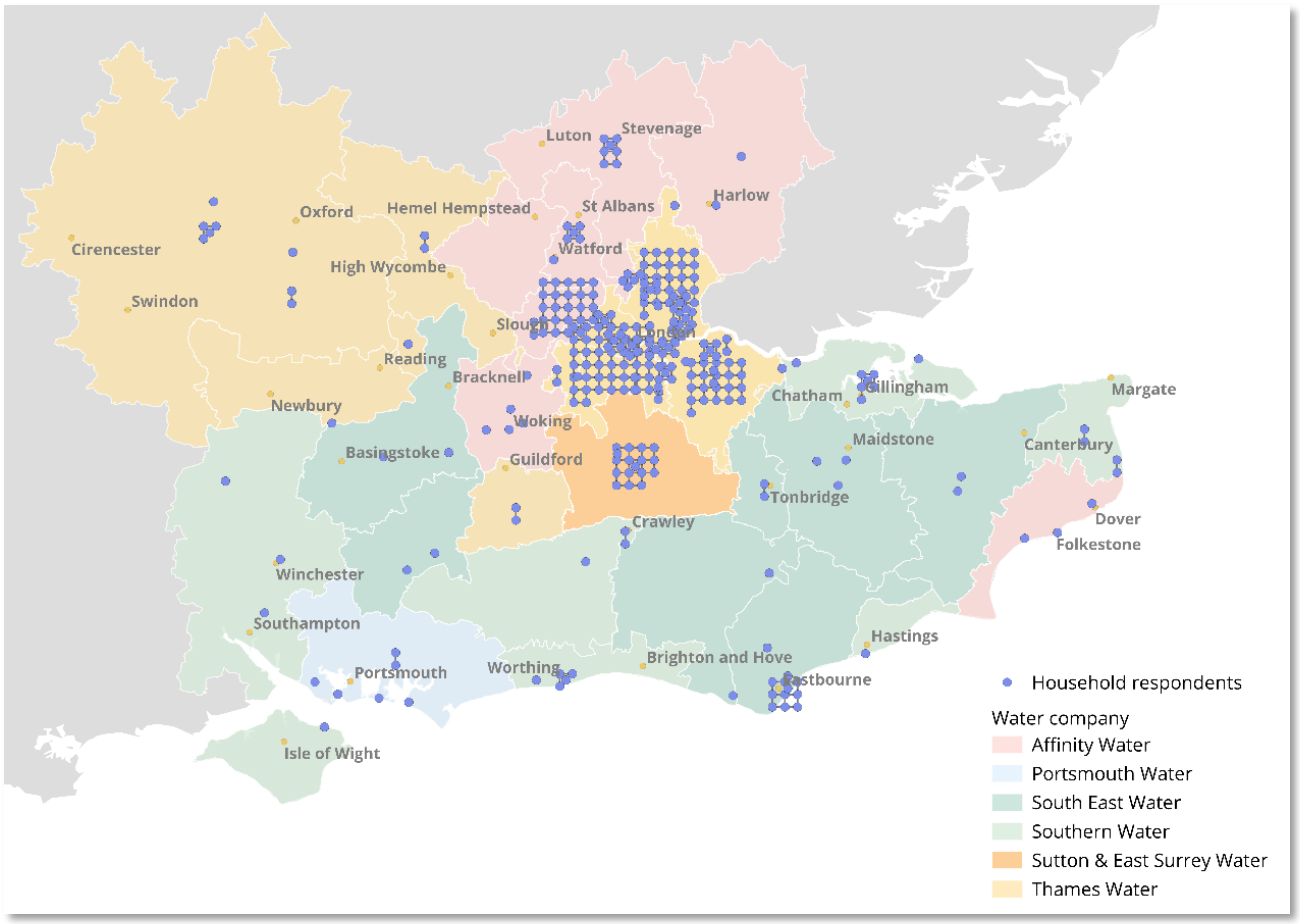
The target sample size was 300 respondents. This is sufficient to ensure robust results in terms of the precision of customer preference weight estimates (e.g. 95% confidence intervals). Respondents were recruited from online panel providers. The survey was completed online by the respondent immediately following recruitment.

3. Results

3.1 Sample profile

Overall, 309 household customers completed the survey online. The average survey completion time was approximately 15 minutes. Figure 3.1 shows the geographic distribution of respondents.

Figure 3.1: Distribution of survey respondents (n=309)



The survey collected respondent information on socio-economic and demographic characteristics. As detailed below, the sample was representative of households in the South East according to the sampling quotas for respondent gender, age and socio-economic group (SEG). The following summarises the sample according to geographic profile, demographic profile, socio-economic profile, and broad views on the development of the regional plan.

Geographic profile

Figure 3.2 highlights that the majority of the sample were Thames Water customers (58%). However, as shown in Figure 3.3, the geographic distribution of the sample covered all water resource zones (WRZ) in the South East region, with most respondents located in West London (24%), followed by North East London (17%) and South East London (13%).

Figure 3.2: Profile of sample by water services supplier (n=309)

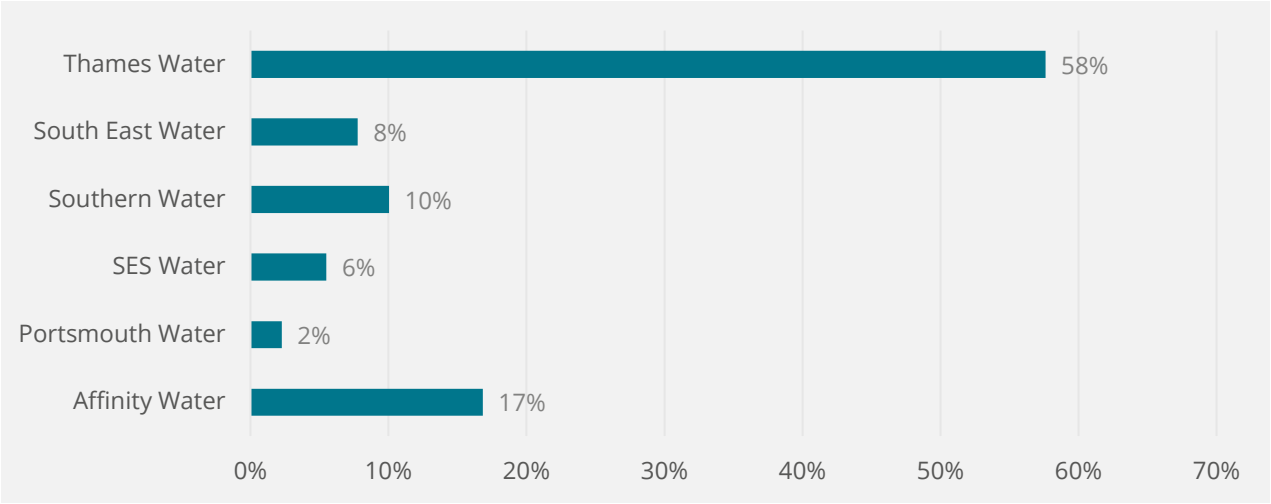
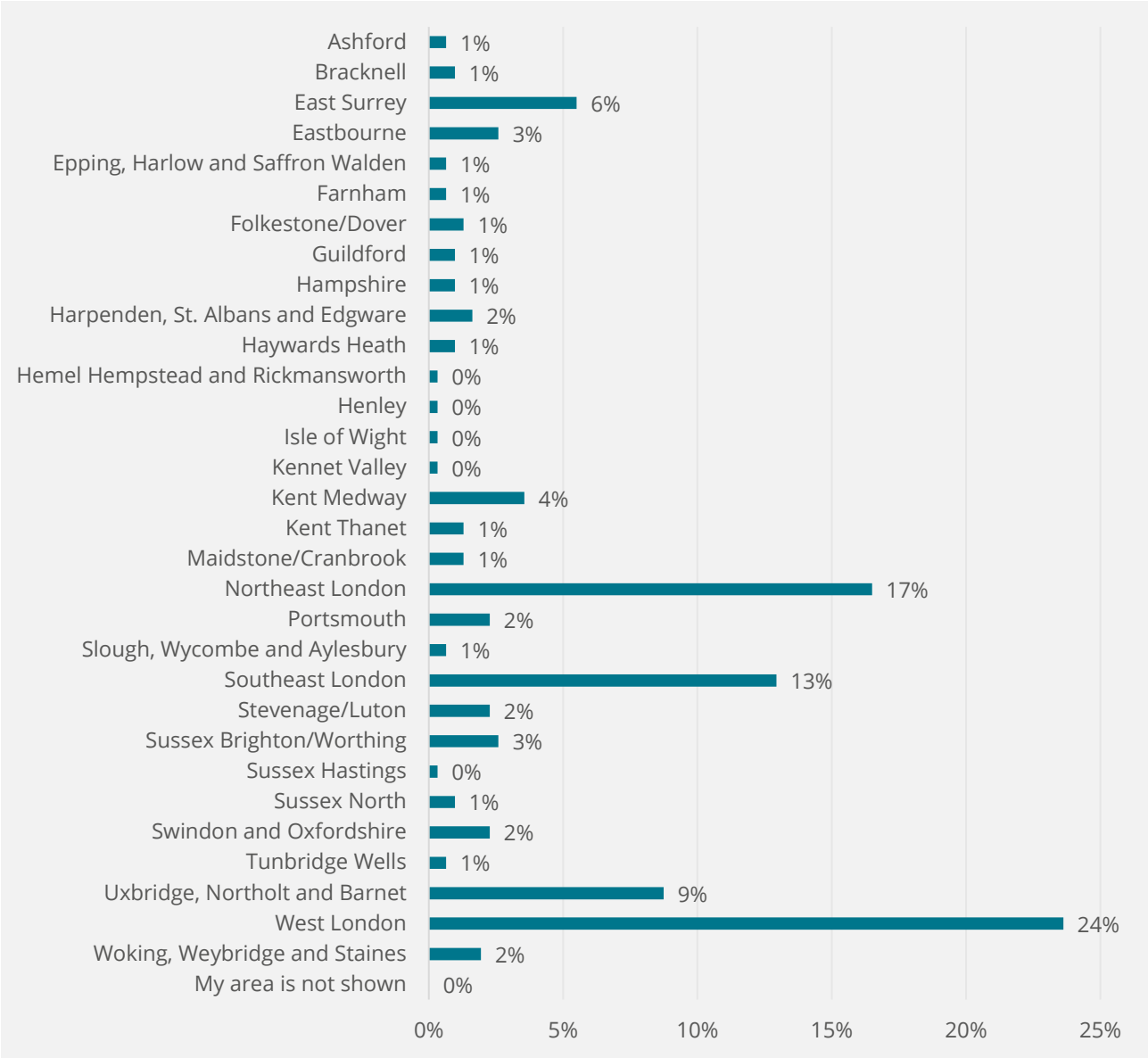
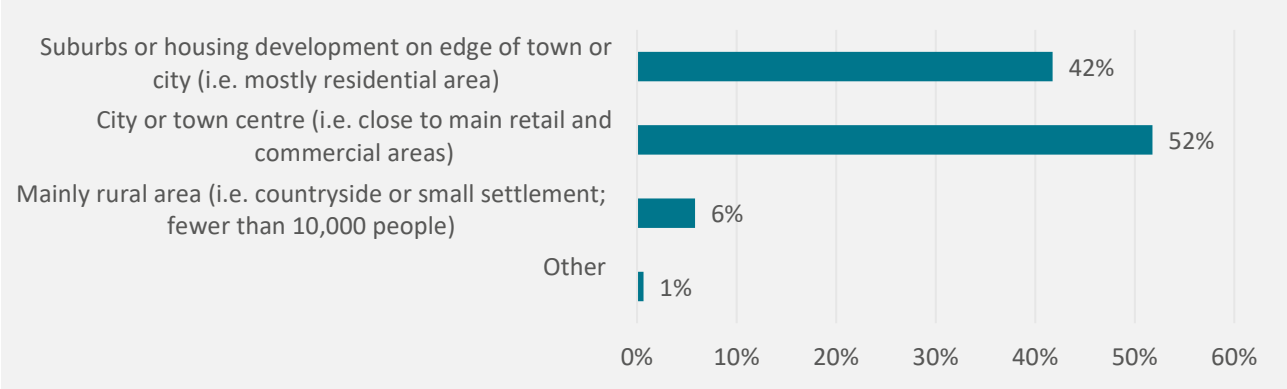


Figure 3.3: Profile of sample by water resource zone (n=309)



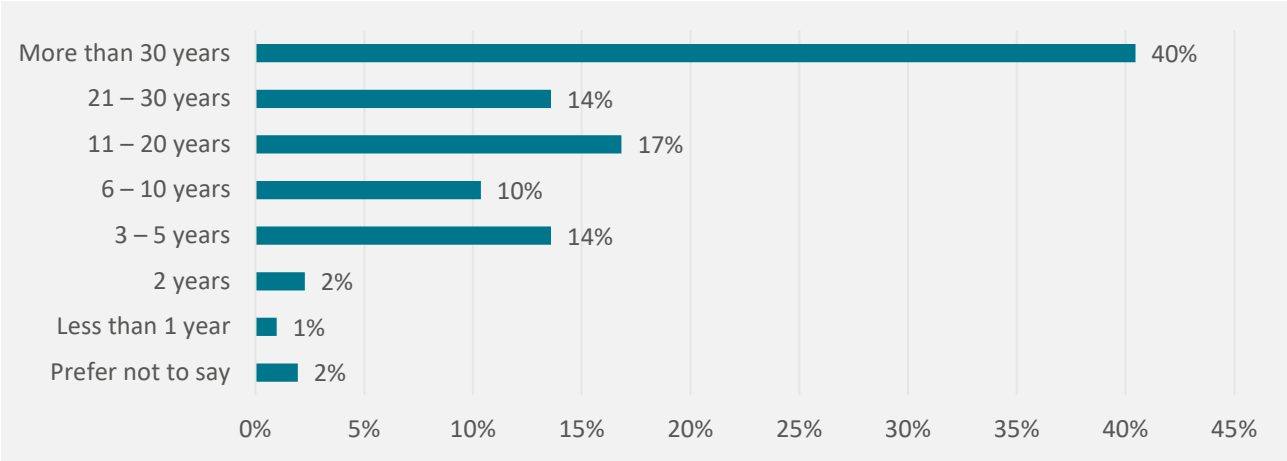
Most respondents indicated that they lived either in the suburbs or edge of town/city (42%), or in the city or town centre (52%), while a smaller share indicated living in a rural area (6%) (Figure 3.4).

Figure 3.4: Profile of sample by urban vs. rural location (n=309)



Respondents were also asked how long they had lived in the WRSE region (Figure 3.5). The majority had lived in the region for over 10 years, and within this group most for more than 30 years (40%), followed by between 11 and 20 years (17%), between 3 and 5 years (14%) and between 21 and 30 years (13%). A smaller proportion indicated they had been in the region between 6 and 10 years (10%), and a minority for less than 3 years, whether 2 years (2%) or less than 1 year (1%).

Figure 3.5: Time lived in WRSE region (n=309)



Demographic profile

The proportion of male/female respondents in the sample was just off the quota target (within +/- 2 percentage point difference) (Table 3.1).

Table 3.1: Respondent gender (n=308)

	n	%
Female	149	48%
Quota		50%
Male	159	52%
Quota		50%
Total	**308**	

Note: One respondent indicated "I prefer to identify another way".

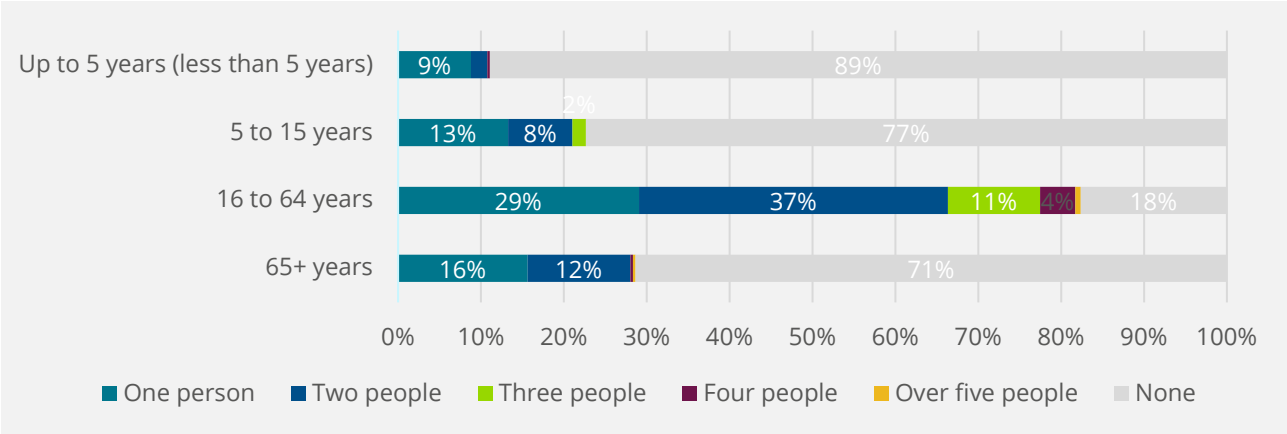
The sample profile by age also compared well with the quota targets (Table 3.2). Most age cohorts were within +/- 2 percentage points difference of the target, reflecting the difference between the profile of the WRSE bill payers and the population/consumer profile based on census data.

Table 3.2: Respondent age (n=309)

	n	%
18-24	28	9%
Quota		9%
25-30	31	10%
Quota		11%
31-44	83	27%
Quota		26%
45 - 54	58	19%
Quota		17%
55 - 64	46	15%
Quota		14%
65+	63	20%
Quota		19%
Total	**309**	

The household composition provided additional insights on the distribution in the age within respondents' households (Figure 3.6). Most household respondents (including themselves) had at least one member between 16 to 64 years (82%). A smaller share of respondents indicated living with someone over 65 years old (29%). An even smaller proportion indicated that their households also included children, whether under the age of 5 (11%) or between 5 to 15 years (23%).

Figure 3.6: Household composition (n=309)



Note: categories are not mutually exclusive, as respondents' households are likely to include more than one member.

Socio-economic characteristics

The sample profile was broadly aligned to the socio-economic group (SEG) quotas with each segment within +/- 5 percentage points difference of the regional profile (Table 3.4).

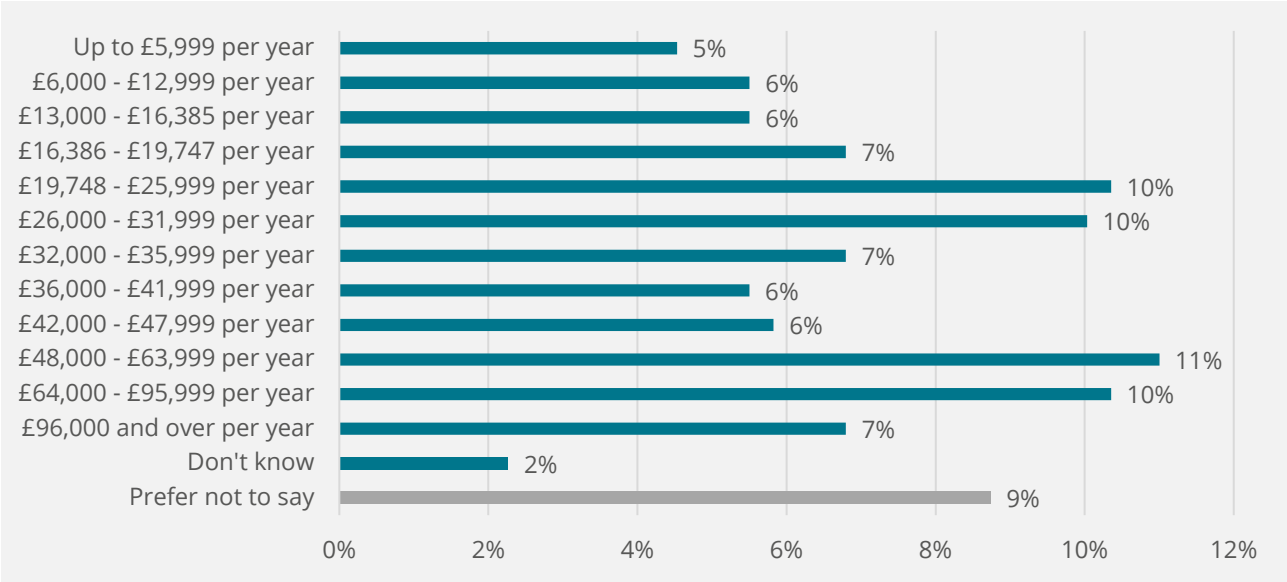
Table 3.3: Respondent socio-economic group (n=309)

		n	%
AB		104	34%
	Quota		29%
C1		93	30%
	Quota		32%
C2		52	17%
	Quota		18%
DE		60	19%
	Quota		21%
Total		**309**	

Note: Market Research Society definitions are: A = professionals, very senior managers, etc.; B = middle management in large organisations, top management or owners of small businesses, educational and service establishments; C1 = junior management, owners of small establishments, and all others in non-manual positions; C2= skilled manual labourers; D = semi-skilled and unskilled manual workers; E = state pensioners, casual and lowest grade workers, unemployed with state benefits only (NRS, 2008 http://www.nrs.co.uk/lifestyle-data/).

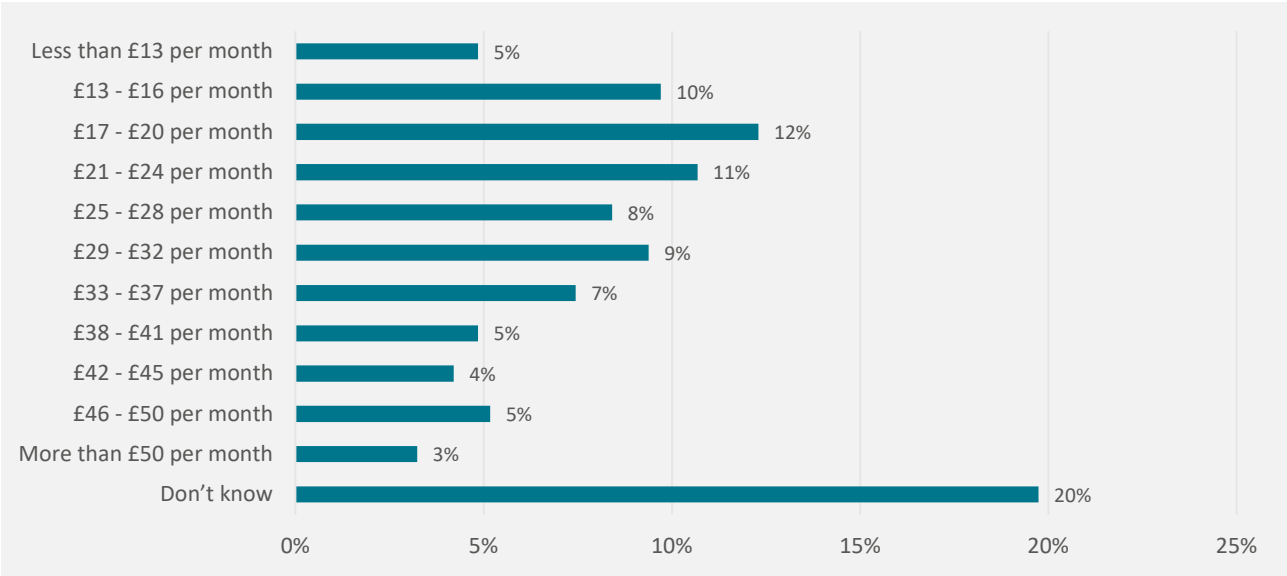
The sample captured the full range of household circumstances in terms of gross annual income. Median household income was in the range £32,000 - £35,999 per year. Approximately one-tenth of respondents (11%) reported household income as £12,999 per year or less.

Figure 3.7: Gross annual household income (n=309)



The median household water services bill for the sample was £29 - £32 per month. This is just below the average combined (water and wastewater) bill in England and Wales of £34 per month[8]. A sizeable proportion (20%) indicated that they did not know what they paid for water and sewerage services (Figure 3.8).

Figure 3.8: Household water and sewerage services bill (n=309)

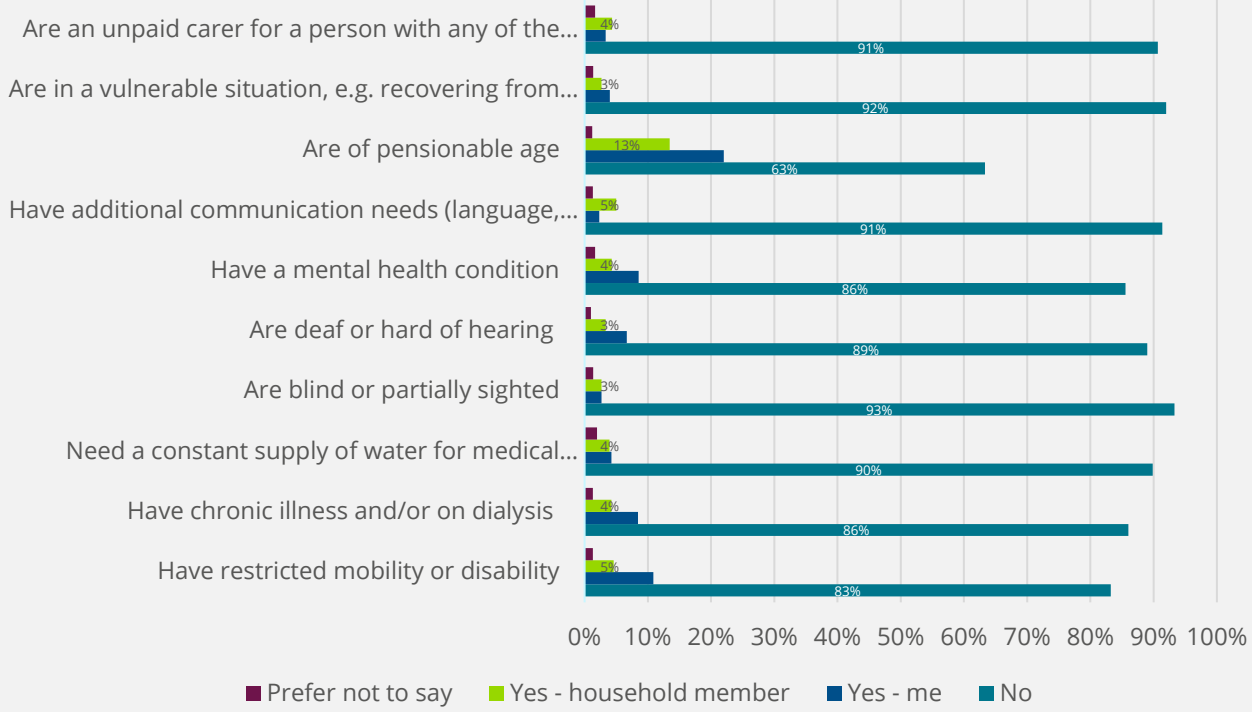


Household circumstances

The survey included a set of questions to identify respondents in potentially vulnerable circumstances (Figure 3.9). Relatively few respondents reported that either they or a household member had certain medical conditions (on average >15%) or was an unpaid carer (11%). A larger proportion of respondent household included at least one member of pensionable age (35%).

[8] From Discover Water data reported by water companies in 2020/21.

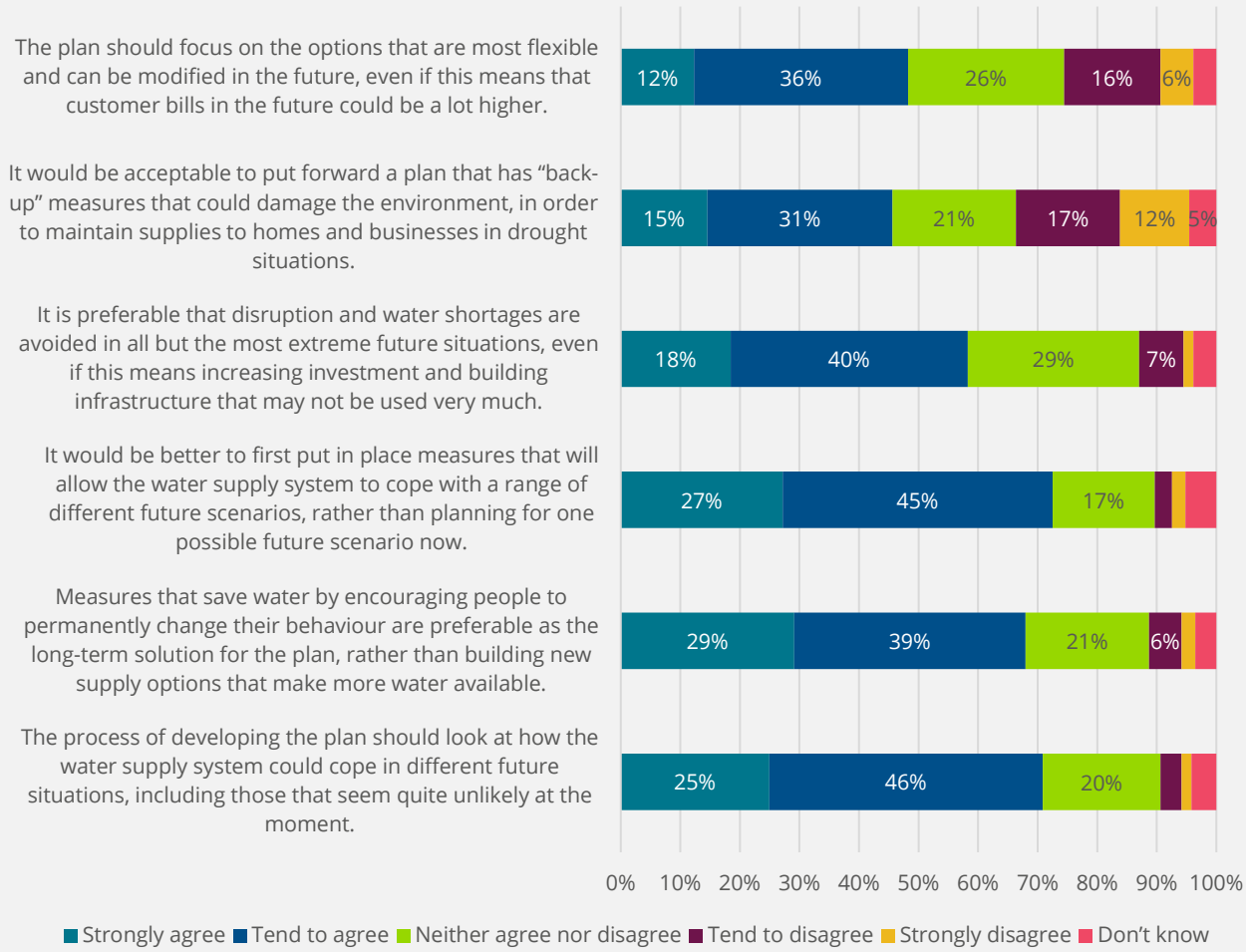
Figure 3.9: Respondent household circumstances (n = 309)



Respondent views on the development of the regional plan

A series of follow up questions asked respondents to express their views and opinions on aspects of WRSE's approach to developing the regional plan (Figure 3.10). Results show that the majority of respondents agreed (45%) or strongly agreed (27%) that it would be better to first put in place measures that will allow the water supply system to cope with a range of different future scenarios, rather than planning for one possible future scenario now. A majority of respondents (71%) also agreed or strongly agreed that the process of developing the plan should look at how the water supply system could cope in different future situations, including those that seem quite unlikely at the moment. Although by a slightly slimmer majority (68%), most respondents felt that measures that save water by encouraging people to permanently change their behaviour are preferable as the long-term solution for the plan, rather than building new supply options that make more water available.

Figure 3.10: Views on WRSE planning approach (n=309)



3.2 Customer preferences for best value criteria

Customer preferences for the WRSE regional plan BVC were elicited via the best-worst scaling (BWS) choice exercise described in Section 2.2. The main results are preference weights that quantify customer priorities, which can be interpreted as the level of importance placed on different outcomes and constraints for the regional plan. As such, the weights measure the relative importance of the BVC and are an input to the WRSE investment modelling that will compare the performance of alternative candidate long-term plans for the region.

Choice task results

The BWS response data was analysed using conventional choice model estimations to quantify the preference weights for the 14 BVC attributes[9] (Box 3.1).

[9] The full model results are provided Appendix F.

Box 3.1: BVC attribute labels

Label	BVC attribute*
ADAPT	Make the water system more adaptable
CARBON	Net zero carbon impact from the plan
COST_ACCEPT	Deliver the plan at an acceptable cost
COST_BALANCE	Balance of cost the plan for current customers vs. future customers
CUST_PREF	Use water supply options that customers prefer
DEPENDENCY	Reduce dependency on sensitive river habitats and groundwater sources
DROUGHT	Reduce the need for emergency drought measures
ENOUGH_WATER	Make sure there is enough water for everyone
LEAK	Reduce leaks from the water system
MODIFY	Make the water system easier to modify
NEG_ENV	Minimise negative environmental impact
POS_ENV	Maximise positive environmental impact
REDUCE	Reduce the amount of water used
RELIABLE	Make the water system more reliable

*See Table 2.3 for full description provided to respondents.

Table 3.4 reports the main results with the preference weights reported as odds ratios (OR). The preference weights are measured relative to the base case "Use water supply options that customers prefer" (CUST_PREF) (OR = 1.0). If a BVC attribute has a weight greater than one, it is (on average) viewed by customers to be a higher-level priority than CUST_PREF; a weight below one would signify a lower-level priority (on average). If a weight is not statistically different to 1.0 (e.g. at the 95% level of significance), it is not possible to conclude that the level of priority is different from the base case. Overall, the results can be interpreted as the both the priority ordering for the value criteria and the strength of preference.

The main observations from the choice model estimation are:

- The highest priority for respondents was "make sure there is enough water for everyone" (ENOUGH WATER = 6.0), reflecting the importance of maintaining the supply-demand balance, not only for household use but other sectors too.
- The second tier of priorities features the some of the key constraints for the regional plan covering efficiency, affordability and sustainability - namely "reduce leaks" (LEAK = 3.8), "deliver the plan at an acceptable cost" (COST_ACCEPT = 3.4), and "reduce dependency on sensitive river habitats and groundwater sources (DEPENDENCY = 3.0).
- Below this is a cluster of factors relating to demand reductions (REDUCE = 2.7), environmental performance (POS_ENV = 2.6; NEG_ENV = 2.6), and the resilience of the water supply system to extreme events (RELIABLE = 2.5). An interesting result is that respondents did not place greater weight on positive environmental impacts over negative environmental impacts (or vice versa), but instead viewed these as equivalent.

Table 3.4: Customer preference weights for BVC attributes

BVC attribute		Coef.	s.e	OR
ENOUGH_WATER	Make sure there is enough water for everyone	1.790	1.257	6.0
LEAK	Reduce leaks from the water system	1.325	1.082	3.8 G
COST_ACCEPT	Deliver the plan at an acceptable cost	1.219	1.534	3.4 FG
DEPENDENCY	Reduce dependency on sensitive river habitats and groundwater sources	1.097	1.085	3.0 EFG
REDUCE	Reduce the amount of water used	0.983	1.020	2.7 DEF
POS_ENV	Maximise positive environmental impact	0.952	1.451	2.6 DE
NEG_ENV	Minimise negative environmental impact	0.957	1.259	2.6 CDEF
RELIABLE	Make water system more reliable	0.927	0.704	2.5 CDEF
COST_BALANCE	Balance of cost the plan for current customers vs. future customers	0.757	1.190	2.1 CD
DROUGHT	Reduce risk of emergency drought measures	0.687	0.637	2.0 C
ADAPT	Make water system more adaptable	0.388	0.610	1.5 B
CARBON	Balance carbon impact	0.138	1.581	1.1 AB
MODIFY	Make water system easier to modify	0.192	0.928	1.2 AB
CUST_PREF	Use options that are preferred by customers	(base)	(base)	1.0 A
Model fit				
No. respondents		309		
No. observations		4223		
Log-likelihood		-6,235.42		

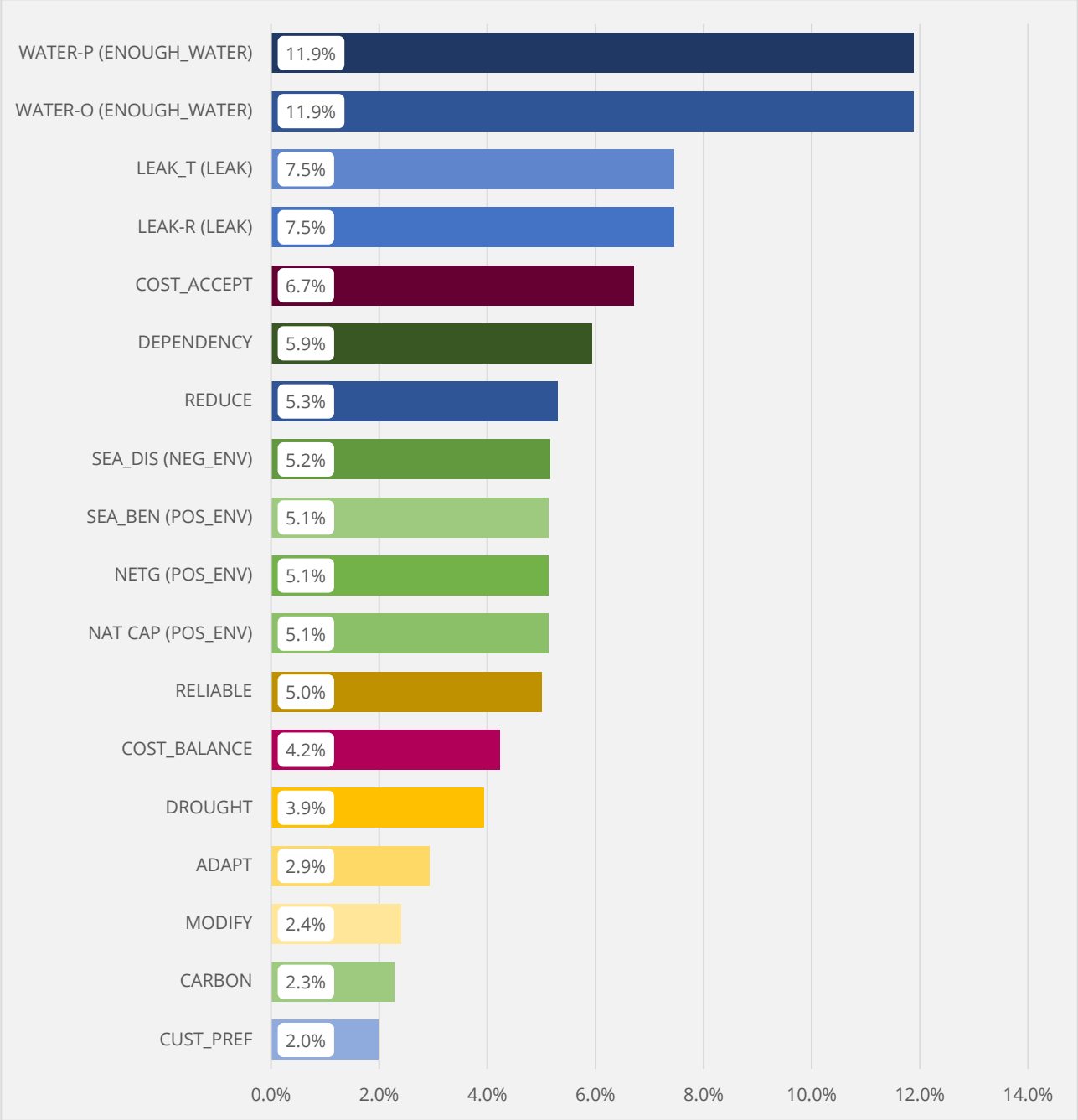
Notes: Rank ordered mixed logit model estimation. [1] Coefficient estimates are significant at the 1% level except MODIFY and CARBON; [2] OR's sharing a letter (A, B, C, D, E, F, G) are not significantly different at the 5% level.

- Lower rated priorities include "Balance of cost the plan for current customers vs. future customers" (COST_BALANCE = 2.1) and "Reduce risk of emergency drought measures" (DROUGHT = 2.0). The relatively lower level of importance placed on reducing the likelihood of severe drought restrictions likely reflects a degree of insensitivity from respondents to the change in risk from 1-in-200 to 1-in-500.
- The final tier includes the further resilience metrics of "Make water system more adaptable" (ADAPT = 1.5) and "Make water system easier to modify" (MODIFY = 1.2) along with "Balance carbon impact" (CARBON = 1.1). The latter preference weights are not found to be statistically different from the base case "Use water supply options that customers prefer".

Mapping to best value criteria

Figure 3.11 presents the customer preference weights from the choice task results mapped to the full set of best value criteria (as detailed in Table 1.1).

Figure 3.11: Customer preference weights for WRSE regional plan best value criteria



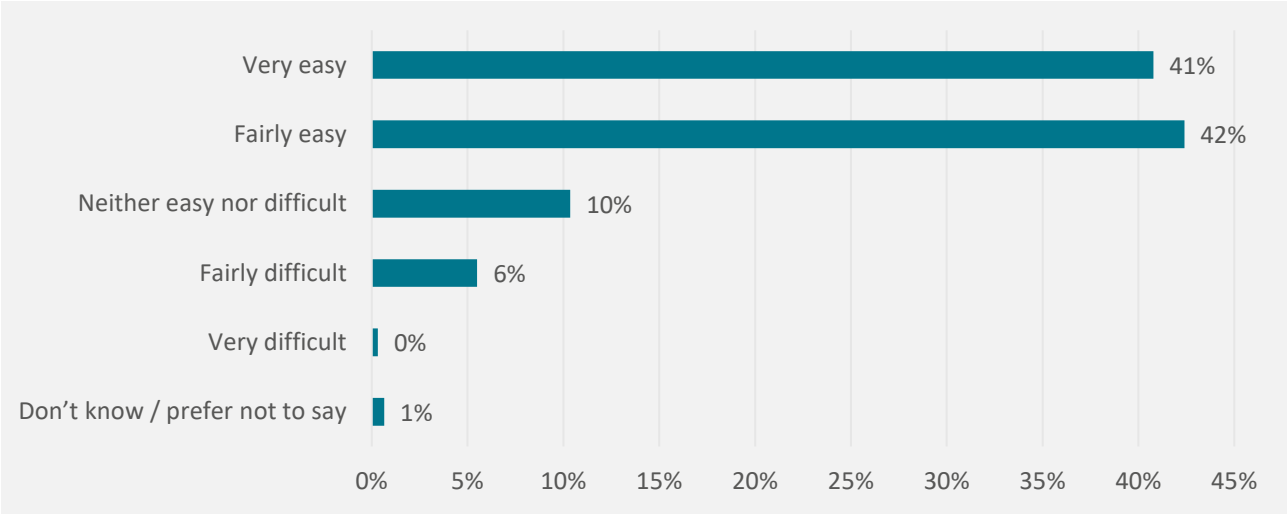
Notes: See Appendix C for the calculation of preference weights in percentage point terms.

In broad terms, the preference weights indicate the following a customer priority hierarchy for the top-level outcomes for the WRSE BVC: [1] Deliver a secure supply of water to customers and others > [2] Deliver the plan at a cost that is acceptable to customers > [3] Deliver environmental improvement and benefits to society > [4] Increase the resilience of the region's water supply systems.

3.3 Respondent feedback

Responses to follow-up questions indicate that respondents found the survey engaging and straightforward. In particular, the majority of respondents (83%) stated that the survey was easy to complete (either "very easy" or "fairly easy") (Figure 3.12).

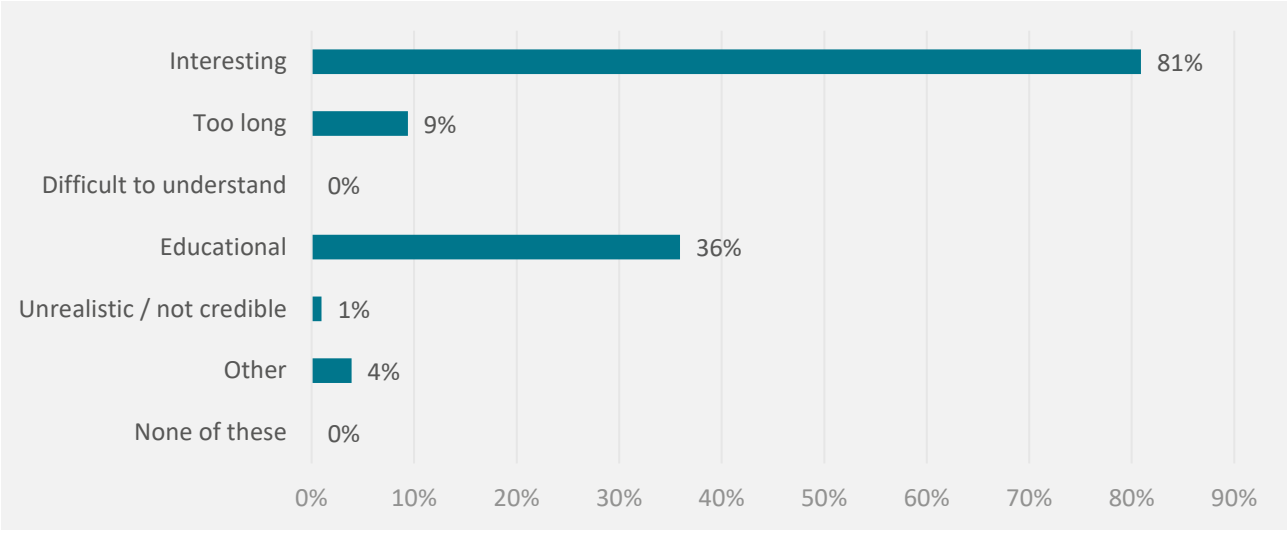
Figure 3.12: Ease of answering questions in the survey (n=309)



Sample size: Household – 309 respondents

Similarly, a large portion of respondents stated that they found the survey interesting (81%) or educational (36%) (Figure 3.13). Some respondents, however, did indicate that the survey was too long (9%). No respondents indicated that they found the survey difficult to understand.

Figure 3.13: Feedback on the survey (n=309)



4. Conclusions

4.1 Summary

The results of this study support the best value planning approach that underpins the development of the WRSE regional plan. The customer preference weights for the best value criteria were estimated using a choice modelling approach, with the research implemented through a representative online survey of household customers in the South East.

The main results indicate a tiering to customers' priorities for the regional plan outcomes:

- **Top priorities**: foremost to ensure the long-term security of supply in the region, both for public supply purposes and other sectors. Ranking just below this are the key considerations for improving the efficiency of the water supply system in terms of reducing leakage and reducing its dependency on sensitive habitats and groundwater sources, along with the cost and customer affordability constraints for the plan.

- **Mid-tier priorities**: feature several dimensions of the performance of the plan relating to wider environmental impacts, reducing demand for water, and improving resilience to extreme events.

- **Lower priorities**: include wider aspects of the resilience of the water supply system, including minimising the risk of emergency drought restrictions, along with balancing the carbon impact and the mix of options used.

Overall respondent feedback on the survey was positive, indicating that there was a good level of understanding of the best value criteria and the choice task exercise. Overall, the study results are judged to be robust and fit-for-purpose for use in WRSE's investment modelling process.

Appendix A: Customer survey

Survey script

Showcards

Appendix B: Best value criteria mapping to choice task attributes

Outcome	Value criteria	Metrics	Attribute	Notes
Deliver a secure supply of water to customers and other sectors to 2100	Meet the supply demand balance	Public Water Supply - supply demand balance profile (Ml/day)	Make sure there is enough water for everyone	-
		Provides additional water needed by other sectors (Ml/day)	Make sure there is enough water for everyone	Incl. with PWS. Upfront explanation to customers states that the purpose of the plan is make sure there is enough water available for all sectors.
	Leakage	50% reduction in leakage by each company by 2050 from 2017/18 baseline (%)	Reduce leaks from the water system	-
		% leakage reduction above 50%	Reduce leaks from the water system	-
	Water consumption	Distribution input per head of population (Litres/person)	Reduce the amount of water used	-
	Customer preference	Customer preference for option type (score)	Use options that are preferred by customers	-
Deliver environmental improvement and benefits to society	Strategic Environmental Assessment (SEA)	Programme benefit (score max)	Maximise positive environmental impact	-
		Programme disbenefit (score min)	Minimise negative environmental impact	-
	Natural capital	Enhancement of Natural Capital Value (£m)	Maximise positive environmental impact	Include in maximise positive environmental impact / minimise negative environmental impact due to degree of overlap in impacts covered

Outcome	Value criteria	Metrics	Attribute	Notes
	Abstraction reduction	Reduction in the volume of water abstracted at identified sites (Ml/day) and by when (date)	Reduce dependency on sensitive river habitats and groundwater sources	-
	Biodiversity	Net-gain score (%)	Maximise positive environmental impact	Include in maximise positive environmental impact
	Carbon	Cost of carbon offsetting (£m)	Balance carbon impact	-
Increase the resilience of the region's water systems	Drought resilience	Achieve 1 in 500-year drought resilience (date achieved)	Reduce risk of emergency drought measures	-
	Resilience assessment - Reliability	Programme reliability score	Make water system more reliable	-
	Resilience assessment - Adaptability	Programme adaptability score	Make water system more adaptable	-
	Resilience assessment - Evolvability	Programme evolvability score	Make water system easier to modify	-
Delivered at a cost that is acceptable to customers	Programme cost	Net Present Value (NPV) using the Social Time Preference Rate (£m)	Deliver the plan at an acceptable cost	-
	Intergenerational equity	Health rate (THDR 1%)	Balance of cost the plan for current customers vs. future customers	-

Appendix C: Customer preference weights for best value criteria

Criteria	Attribute	Odds ratio	Customer preference weight (%)
Public Water Supply - supply demand balance profile (Ml/day)	Make sure there is enough water for everyone	5.99	**11.9%**
Provides additional water needed by other sectors (Ml/day)	Make sure there is enough water for everyone	5.99	**11.9%**
50% reduction in leakage by each company by 2050 from 2017/18 baseline (%)	Reduce leaks from the water system	3.76	**7.5%**
% leakage reduction above 50%	Reduce leaks from the water system	3.76	**7.5%**
Distribution input per head of population (Litres/person)	Reduce the amount of water used	2.67	**5.3%**
Customer preference for option type (score)	Use options that are preferred by customers	1.00	**2.0%**
Programme benefit (score max)	Maximise positive environmental impact	2.59	**5.1%**
Programme disbenefit (score min)	Minimise negative environmental impact	2.60	**5.2%**
Enhancement of Natural Capital Value (£m)	Maximise positive environmental impact	2.59	**5.1%**
Reduction in the volume of water abstracted at identified sites (Ml/day)	Reduce dependency on sensitive river habitats and groundwater sources	3.00	**5.9%**
Net-gain score (%)	Maximise positive environmental impact	2.59	**5.1%**
Cost of carbon offsetting (£m)	Balance carbon impact	1.15	**2.3%**
Achieve 1 in 500-year drought resilience (date achieved)	Reduce risk of emergency drought measures	1.99	**3.9%**
Programme reliability score	Make water system more reliable	2.53	**5.0%**
Programme adaptability score	Make water system more adaptable	1.47	**2.9%**
Programme evolvability score	Make water system easier to modify	1.21	**2.4%**
Net Present Value (NPV) using the Social Time Preference Rate (£m)	Deliver the plan at an acceptable cost	3.39	**6.7%**
Health rate (THDR 1%)	Balance of cost the plan for current customers vs. future customers	2.13	**4.2%**
	Sum	50.41	**100%**

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Final Report | May 2021

Customer preferences on added value for large resource schemes

Final Report

August 2022

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File name: 3543rep02_master_SRO_Final_v3

V1

Contents

Executive Summary

PJM Economics and Accent were commissioned by a club of water companies to obtain primary evidence on customer preferences for 'added value' elements to inform the development of 11 strategic resource options (SROs). This evidence will be used as part of the RAPID Gate 2 submissions for the SROs.

The objectives of the research were to understand:

- what added value customers perceive is important as part of infrastructure development, to understand preferences for the added value (and if those preferences change depending on the geographical location/type of scheme)
- how much are customers prepared to pay
- what language should *be* use*d* to explain the added value.

The research started with a review of the literature on public value, included in an appendix to this report. There is a large set of guidance documents and frameworks on 'added value' in the water sector, but the concept is still not fully and universally embedded in the water companies' culture. The review found little empirical evidence on perceptions and preferences regarding public value in the UK water sector. Strategic Resource Options Gate One submissions have also included little information on initiatives to deliver public value.

The quantitative stage of research has focused on estimating customer willingness-to-pay (WTP) valuations of 26 possible project additions at SRO sites via a stated preference survey. The survey included a pairwise choice exercise to obtain willingness-to-pay values for each of 26 project additions (economic, social, or environment).

It also included a contingent valuation exercise providing a measure of maximum WTP for project additions in total. The distance from the participants' location to the SRO sites was a part of the scenarios shown and was specified as either local (5 miles) or far away (50 miles).

The survey was implemented via online and face-to-face interviews and achieved a sample of 5,902 households and 553 non-household customers. The data were weighted to UK census data (households) and UK business population estimates (non-households) to be reflective of the population.

The main findings of the study are:

- The highest valuations for household customers were: 'Specialist habitats created for wildlife' (£3.87 annually); 'New wetland area' (£3.24 annually); 'Space provided for sustainable agriculture' (£2.61 annually). Households' average valuation was considerably higher in the environmental area (£3.05), compared to the economic area (£1.19) and the social area (£1.16). The combined annual valuation of all project additions was around £36

- The highest valuations for non-Household customers were: 'Beach area' (0.98% of the water only bill, annually); 'Sensory garden for those with learning difficulties' (0.93% of the water only bill, annually); 'Specialist habitats created for wildlife' (0.73% of the water only bill, annually). The combined annual valuation of all project additions was 11.83% of the water only bill

- The estimates of non-household WTP values were substantially less precise than for households

- There is considerable variation in WTP for project additions across types of sites, (project additions being most highly valued at Water treatment works) and by distance of the site

- The WTP for a 'package' of project additions was lower than the sum over individual project additions.

There are several indications that the stated preference exercises worked well and produced valid findings, such as positive participant feedback, reasonable differences across segments, and consistency between the valuations and the answers to other survey questions and the results of a previous qualitative study.

The study also demonstrates, using data from three SROs, how the results are intended to be used within SRO Gate 2 submissions, aggregating the valuations of individual project additions by type of site, company, and distance, to the respective population.

1 Introduction

1.1 Background and Objectives

PJM Economics and Accent were commissioned by a club of water companies to conduct a multi-stage programme of research to obtain primary evidence on customer preferences for 'added value' elements to inform the development of 11 strategic resource options (SROs). This evidence will be used as part of the RAPID Gate 2 submissions for the SROs.

The objectives of the research were:

- To understand what added value customers perceive is important as part of infrastructure development
- To understand preferences for the added value – what should be the balance between options such as economy, jobs, apprenticeships, leisure, education and carbon sequestration etc
- To understand if the preferences change depending on the geographical location/type of scheme or other factors
- To estimate how much are customers prepared to pay
- To understand what language should be used to explain the added value.

These objectives were addressed via a study involving:

- A literature review
- Qualitative customer research
- Quantitative customer research.

This report focusses on the findings of the quantitative customer research. Findings from the literature review and qualitative research can be found in the appendices.

1.2 Contents

Section 2 sets out the study methodology, including survey design and implementation; Section 3 presents findings, integrating the qualitative and quantitative elements of the research; and Section 4 summarises and concludes.

Appendices to the document include:

- Appendix A: the full literature review
- Appendix B: the main survey questionnaire
- Appendix C: Phase 1 qualitative findings

- Appendix D: Phase 2 qualitative findings
- Appendix E: details regarding the econometric modelling
- Appendix F: tables of aggregate valuations.

2 Methodology

2.1 Introduction

The quantitative stage of research has focused on estimating customer willingness-to-pay (WTP) valuations of 26 project additions at SRO sites via a stated preference (SP) survey.

This section of the report provides the following details:

- SP design (2.2)
- Survey administration (2.3)
- Sample characteristics and the weighting used (2.4)
- Participant feedback (2.5).

2.2 Stated Preference Design

Overview

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 valuation purposes, such 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. Like best-worst scaling / MaxDiff, econometric analysis of the data allows for an importance or priority index of options to be estimated

- **Menu-based / slider**
  Participants construct their own package of service levels from a menu where each level of service improvement has an associated cost impact. As customers select higher levels of service, the bill rises accordingly, and respondents are updated in real-time as regards the total bill impact of their choices.

For the present study, based on the nature of the goods to be valued, it was decided to structure the survey questionnaire to include:

- A pairwise choice exercise to obtain willingness-to-pay (WTP) values for each of 26 project additions

- A contingent valuation (CV) exercise providing a measure of maximum WTP for project additions in total.

On its own, the pairwise choice exercise could potentially lead to WTP estimates that support project additions across the full set of SROs that imply larger bill increases than customers are willing to pay for in total. This is due to the so-called 'package effect', which occurs when the sum of valuations obtained for a series of small goods exceeds the valuation as a combined package. The contingent valuation sets an upper bound on how much customers of each company are willing to pay in total for added value elements.

SP1 Pairwise Choice Exercise

The pairwise choice exercise covered a set of 26 project additions in the economic, social, and environmental domains. The project additions included in the choice exercise are shown in Table 1 below.

Table 1: Project additions covered in the pairwise choice exercise

	ID	Project addition	Full description shown in the survey questionnaire (where different)
Economic	Att1	One in every 50 jobs will be an apprenticeship	One in every 50 jobs created to develop the site will be an apprenticeship
	Att2	A quarter of all employees are local	A quarter of all employees working to develop the site will be recruited from the local area
	Att3	Increased visitor numbers, with economic benefits	Increased visitor numbers, with economic benefits to the surrounding area
	Att4	Links to heritage and local history, through signs	Links to heritage and local history, through signs put up at the site.
	Att5	Space provided for sustainable agriculture	Space provided for sustainable agriculture, including regenerative farming and re-wilding
	Att6	Irrigation reservoirs to improve local farmland	
	Att7	Café with locally sourced food	
	Att8	Fish ponds created, with public access	
Social	Att9	Visitor centre	
	Att10	Shop selling sustainable products	Shop selling sustainable products and gardening materials
	Att11	Outdoor BBQ/picnic facilities	
	Att12	Water sports facilities, e.g. sailing, paddleboarding	
	Att13	Land-based recreation/amenities	Land-based recreation/amenities, e.g. Go Ape, Segway hire, cycle hire
	Att14	Restaurant/café/welfare facilities	
	Att15	Wildlife viewing platform, Bird watching facilities	
	Att16	Children's playground	
	Att17	Sensory garden for those with learning difficulties	Sensory garden/space for those with learning difficulties
	Att18	Walking paths, Boardwalk, Bridleway, Cycle trail	
	Att19	Beach area	
	Att20	Campsite	
	Att21	Conference centre	
	Att22	Education/training/research facility	
	Att23	Links to bus and rail stations	
Environmental	Att24	Reduced flood risk to surrounding area	
	Att25	New wetland area	New wetland area, with benefits for flood risk, wildlife habitats and carbon capture
	Att26	Specialist habitats created for wildlife	Specialist habitats created for wildlife, including butterfly bank, wildlife refuge, ponded areas, reed beds, new woodland and meadow, and creation of landscape scale habitat corridors

Each of the two options in the pairwise choice exercise included up to three project additions. Additionally, the format included both the type of site, and its distance from the participant, as scenario-level features, as well as including the bill impact of each option.

The following types of site were covered in the exercise:

- Reservoir
- Canal to transfer water from one area to another
- Pipeline to transfer water from one area to another
- Water treatment works (WTW)

The distance levels were agreed to be local (5 miles) and far away (50 miles).

The bill impacts were shown in pounds for households and as a percentage of the annual water only bill for non-households and were drawn from the sets shown in Table 2.

Table 2: Bill impacts in the pairwise choice exercise

	Household	Non-household
1	Same as now	Same as now
2	£0.5 more than now	0.125% more than now
3	£1 more than now	0.25% more than now
4	£2 more than now	0.5% more than now
5	£3 more than now	0.75% more than now
6	£5 more than now	1.25% more than now

The project additions, types of sites, distances, and bill impacts were combined in an experimental design that was created to obtain the sequences of choices that were actually faced by participants in the survey. In each question, participants were shown two scenarios, and they were asked to indicate which one they would choose.

- Figure 1 shows the introductory screen.

- Figure 2 shows an example of a choice card from the survey, which illustrates the nature of the questions asked.

Participants each saw ten questions such as the one shown in Figure 2.

Figure 1: SP1 introductory screen

As you've just seen one of the impacts relates to the change in your water bill. In some options there will be no increase to your bill while in others there will be an increase.

If an increase is shown, your annual bill would increase by that amount in one year, and would then remain at that level on a permanent basis. The increase would not be applied year on year, nor would it be reversed the following year.

When choosing which option you prefer in each case, please consider:

- Whether the impacts shown are important to you; and
- Your household overall income and expenses, remembering that:
- Any money you pay for these improvements will not be available for you to spend elsewhere
- Other bills may go up or down affecting the amount of money you have to spend in general

Your household bills will also be affected by the rate of inflation ⓘ each year.

Figure 2: Pairwise choice exercise: example choice card

Type of site	Reservoir
Distance from your home	

Which option would you choose for this site?

	Option A	Option B
Project additions	Links to heritage and local history, through signs put up at the site. New wetland area, with benefits for flood risk, wildlife habitats and carbon capture Irrigation reservoirs to improve local farmland	Walking paths, Boardwalk, Bridleway and Cycle trail Restaurant/café/welfare facilities Specialist habitats created for wildlife, including butterfly bank, wildlife refuge, ponded areas, reed beds, new woodland and meadow, and creation of landscape scale habitat corridors
Your annual water bill	Same as now	£2 more than now

The design comprised 20 blocks of 10 questions each (each participant being randomly allocated to one of the blocks) and was restricted as follows.

- Some project additions were only available at 'Reservoir' sites[1].
- A set of project additions always appeared in conjunction with 'Walking paths, Boardwalk, Bridleway and Cycle trail'[2].

[1] Shop selling sustainable products and gardening materials; Outdoor BBQ/picnic facilities; Water sports facilities, e.g. sailing, paddleboarding; Land-based recreation/amenities; Children's playground; Sensory garden/space for those with learning difficulties; Beach area; Campsite.

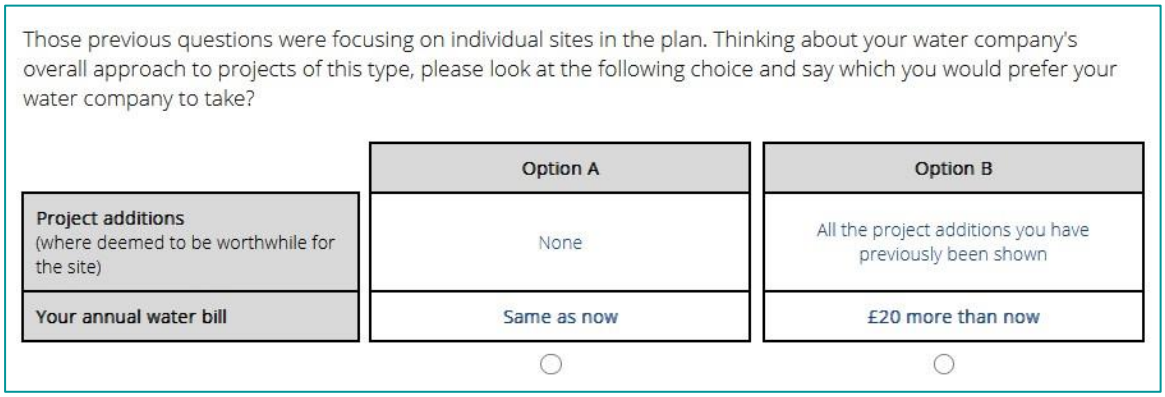
[2] Increased visitor numbers, with economic benefits; Outdoor BBQ/picnic facilities; Water sports facilities, e.g. sailing, paddleboarding; Land-based recreation/amenities; Restaurant/café/welfare facilities; Children's playground; Sensory garden/space for those with learning difficulties; Campsite; Links to bus and rail stations.

SP2 Contingent Valuation Exercise

The exercise was designed to value a 'package' of project additions. The bill impacts for an initial question in each case were varied across the sample, and the bill increase was halved or doubled in a follow-up question, depending on the response to the first question. This is the so-called 'double-bounded contingent valuation' method.

Figure 3 shows an example of a choice card from the survey.

Figure 3: Contingent valuation exercise: example choice card


Those previous questions were focusing on individual sites in the plan. Thinking about your water company's overall approach to projects of this type, please look at the following choice and say which you would prefer your water company to take?

	Option A	Option B
Project additions (where deemed to be worthwhile for the site)	None	All the project additions you have previously been shown
Your annual water bill	Same as now	£20 more than now
	○	○

The bill increases for the first question were randomly chosen from the set {£5, £10, £20, £30, £50} for households, and from {1.25%, 2.5%, 5%, 7.5%, 12.5%} for non-households, where the percentages refer to the annual water only bill[3].

2.3 Survey Administration

A mixed-mode quantitative methodology was followed to ensure that we engaged with a range of different customer types. This included:

- **Online interviews** among domestic customers from all six water companies using Accents panel partners and from client sample provided for Cambridge Water only. Non-household customers and some customers in vulnerable circumstances were also identified using this approach

- **Face to face interviews** were conducted to ensure coverage amongst hard to reach, vulnerable and digitally disengaged customers. Interviews were conducted where customers felt most comfortable – in garden or in home.

A total of 5,902 interviews were conducted with household customers and 553 interviews with non-household customers. Table 3 details the number of interviews conducted by each water company.

[3] The analysis datasets used for the present report include the pilot data because the pilot analysis did not identify any substantial problems requiring major amendments. For the pilot survey, the bill increases were drawn from {£4, £8, £16, £24, £40} and {2%, 4%, 8%,12%, 20%} for households and non-households, respectively.

Table 3: Total number of interviews by water company

	Household	Non-household
Affinity Water	763	80
Anglian Water	989	146
Cambridge Water	73	8
Severn Trent Water	1,682	71
Southern Water	513	38
Thames Water	1,882	210
Total	5,902	533

2.4 Survey Weighting

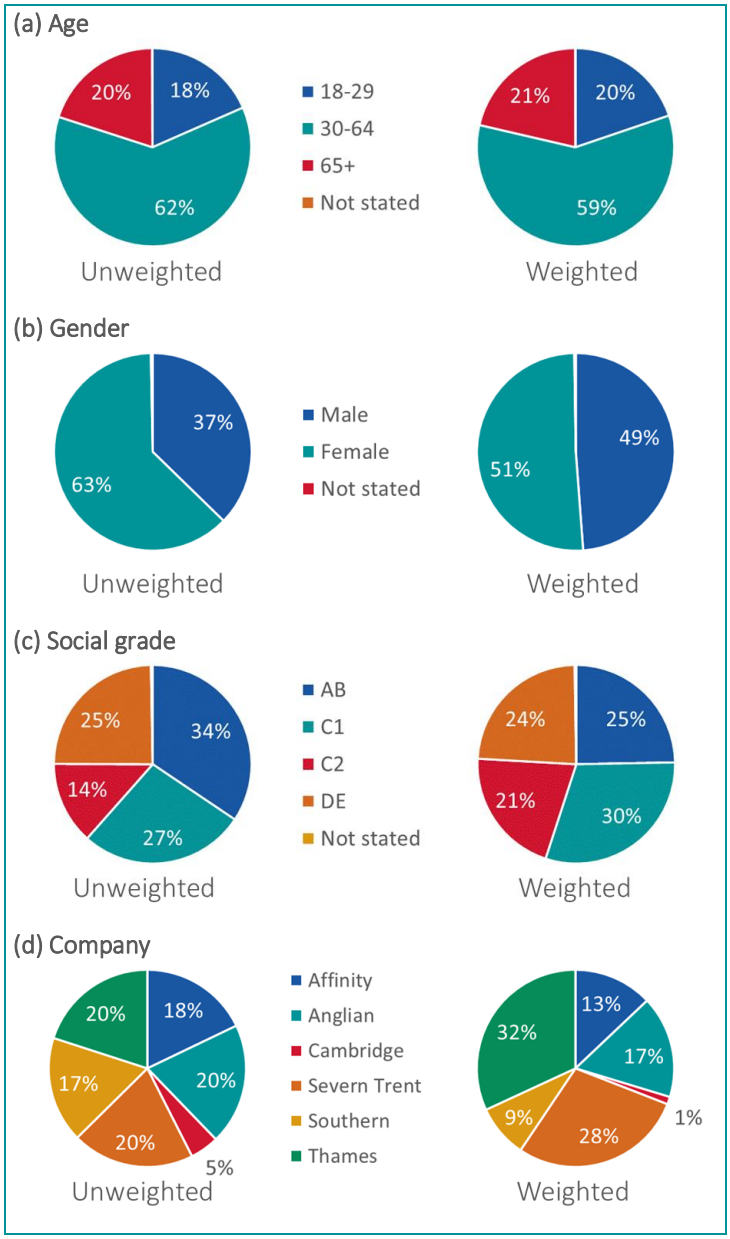
The survey data were weighted to 2011/2021 UK census data (households) and 2021 UK business population estimates (non-households) to be reflective of the population. Separate sets of weights were generated for households and non-households for each of the six companies involved in the study. The relevant population data for each company were constructed via a GIS-based analysis mapping the boundaries of census output areas (households) and UK regions (non-households) to water company areas as closely as possible.

The household data were weighted at the company level by age, gender, and social grade using iterative proportional fitting obtaining six sets of weights, one for each company, which were re-scaled for the data to be reflective of the total population in each company area.

The same procedure was applied for non-households, weighting by number of employees and re-scaling the weights to ensure the data were reflective of the population of businesses in terms of total employment in each company area. The weights were applied throughout the analysis except where otherwise stated.

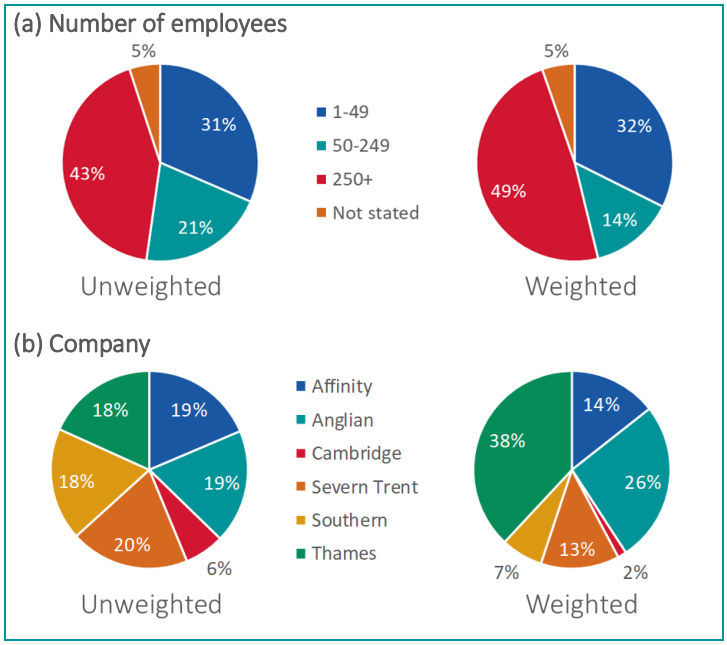
Figure 4 and Figure 5 show the distributions of the weighting variables for households and non-households, respectively.

Figure 4: Household sample characteristics



Base: 5,902 household participants

Figure 5: Non-household sample characteristics



Base: 553 household participants

2.5 Feedback and Diagnostics

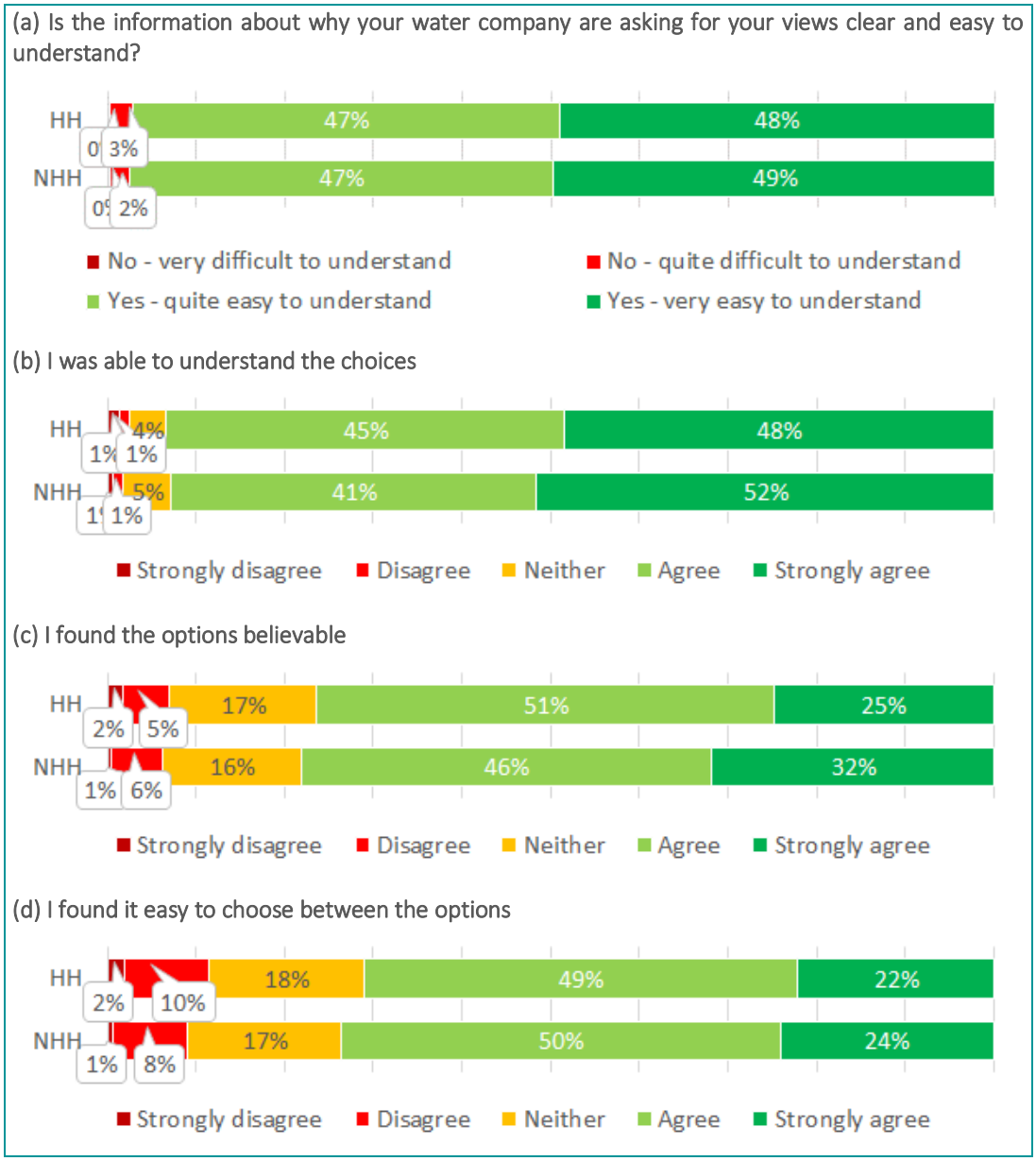
Participant Feedback

The responses to feedback questions are summarised in Figure 6.

Prior to engaging in the pairwise exercise, a vast majority of participants indicated that the information about why their water company were asking for their views was 'very easy' or 'quite easy' to understand (panel (a)).

Following the exercise, only relatively small proportions of participants disagreed a) that they were able to understand the choices, b) that they found the options believable, and c) that they found it easy to choose between the options.

Figure 6: Participant feedback



Base: HH = 5,902; NHH = 553 (unweighted)

Table 4 to Table 6 summarise the open responses to follow-up questions asked of those who (strongly) disagreed with any of the feedback statements in panels (b) to (d) of Figure 6[4]. The reasons given by some of those who disagreed that they were able to understand the choices suggest that, in fact, they did not disagree at all. The most frequent responses were 'Did understand' and 'Clear/well explained – simple/concise', as shown in Table 4.

Some of the most frequent reasons given by those who did not find it easy to choose between the options, were 'Difficult to decide – weigh up benefits'; 'Both options have benefits'; 'Options are similar'; 'Both are good – would choose both'; 'Don't like either/any option'. While these difficulties are inherent in such choice exercises and do not automatically imply that the responses are invalid, we check the robustness of key findings to the exclusion of participants who gave negative feedback from the estimation samples.

[4] Some of the participant responses were coded as falling into multiple response categories.

Table 4: Why were you unable to understand the choices?

Coded response	Frequency	Percent
Did understand	26	0.40%
Clear/well explained – simple/concise	20	0.31%
No reason given	20	0.31%
Some/all were similar/the same	12	0.19%
Costings – focus on profits/don't want to pay more	10	0.15%
Confusing	8	0.12%
Not clear/vague	7	0.11%
Did not understand (not specified)	7	0.11%
Not affected/lack of interest	7	0.11%
Not easy to choose	6	0.09%
Easy	6	0.09%
Difficult language/wording	5	0.08%
Amount of information - lack of/too much	5	0.08%
Too many options	5	0.08%
Nothing/none	5	0.08%
Complicated/difficult	4	0.06%
Not realistic	4	0.06%
Understood pricing	4	0.06%
Able to read – educated etc	4	0.06%
Unable to compare choices	3	0.05%
Location/distance	3	0.05%
Layout – difficult to read etc	3	0.05%
Other	7	0.11%
Not stated	0	0.00%
N/A	2	0.03%
Don't know	2	0.03%

Base: 6,455 participants (full sample)

Table 5: What was not believable about the options shown?

Coded response	Frequency	Percent
It won't happen	89	1.38%
Not realistic – too good to be true	79	1.22%
Cost	66	1.02%
Location/area not suitable	53	0.82%
Benefits – jobs etc	52	0.81%
Don't trust water companies – don't keep promises	48	0.74%
Customer should not have to pay/against bill increases	47	0.73%
Just not believable	37	0.57%
Focus is on profits	30	0.46%
Nothing – it is believable	25	0.39%
Past performance of company	20	0.31%
Investment needed	19	0.29%
Unnecessary	17	0.26%
Marketing stunt – greenwashing etc	15	0.23%
Company should protect environment – avoid dumping sewage	14	0.22%
Choice of options – inadequate/not a real choice	14	0.22%
Not responsibility of water company	12	0.19%
Distance from home – too far etc	11	0.17%
All/most of them	10	0.15%
Options already suggested/in place	10	0.15%
Should focus on primary requirements – supply/quality	10	0.15%
Need clarification/further explanation	8	0.12%

Coded response	Frequency	Percent
Better management of leaks required	6	0.09%
Projects should be self-financing	6	0.09%
Would not benefit area/environment	5	0.08%
Other	20	0.31%
Not stated	10	0.15%
N/A	2	0.03%
Don't know	4	0.06%

Base: 6,455 participants (full sample)

Table 6: Why was it difficult choosing between the options?

Coded response	Frequency	Percent
Difficult to decide – weigh up benefits	131	2.03%
Both options have benefits	127	1.97%
Options are similar	104	1.61%
Price difference	94	1.46%
Both are good – would choose both	79	1.22%
Don't like either/any option	65	1.01%
Don't want to pay more	57	0.88%
Some options had good/better benefits	51	0.79%
Depends on benefit to community/area	51	0.79%
Depends on personal benefit	38	0.59%
Pros and cons to both	34	0.53%
Some benefits had no merit/appeal	33	0.51%
Had to choose cheaper one	32	0.50%
Need clarification/further explanation	32	0.50%
Options are too dissimilar	25	0.39%
Depends on location	24	0.37%
Depends on benefit to environment/wildlife	17	0.26%
Too many choices	15	0.23%
Cost not a factor	15	0.23%
Not difficult/easy	14	0.22%
No reason/none	12	0.19%
Some options are not sensible/realistic	6	0.09%
Company should invest/focus less on profits	5	0.08%
Company should focus on core service	5	0.08%
Company should improve sewerage service – stop illegal dumping etc	4	0.06%
Other	25	0.39%
Not stated	7	0.11%
N/A	3	0.05%
Don't know	8	0.12%

Base: 6,455 participants (full sample)

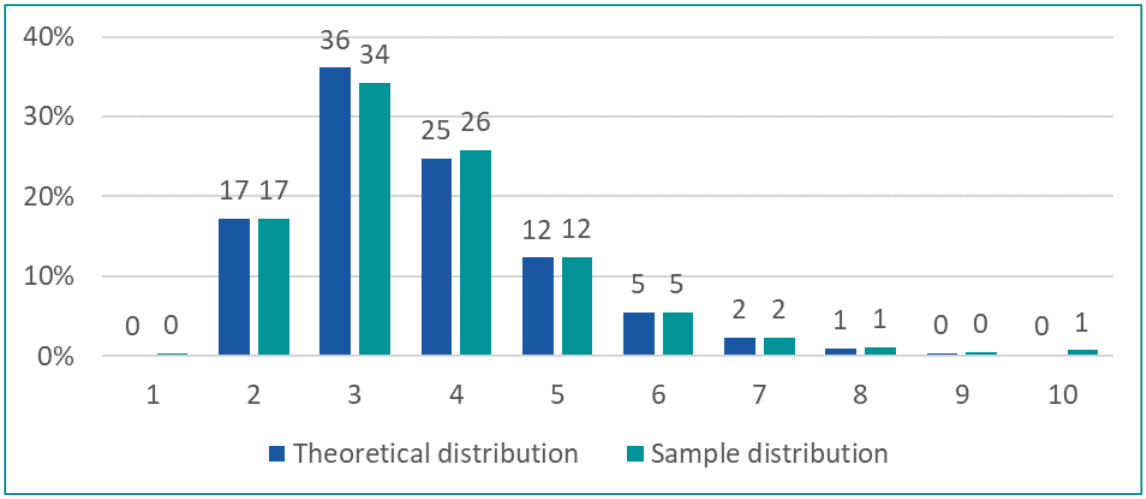
Diagnostics

Making the same choices repeatedly (e.g., Option A chosen nine times in a row) can be indicative of not engaging with the survey. A large number of non-traders implies a poor-quality dataset for analysis.

Figure 7 compares the sample distribution of the maximum length of runs of identical choices (e.g., same option chosen at most 5 times in a row) against the theoretical distribution that is obtained when there are equal choice probabilities for Option A and Option B in each question.

The two distributions are nearly identical which confirms that non-trading is not a cause for concern. Only a tiny proportion (0.7%) chose the same option across all 10 choice occasions.

Figure 7: Distribution of the maximum length of runs of identical choices (SP1)



Base: 6,455 participants (full sample)

Overall, the feedback and choice diagnostics are supportive of the validity of the choice exercise.

3 Findings

3.1 Introduction

Section 3.2 includes descriptive statistics on customer satisfaction; views regarding the most important aspects relating to customers' local environment; recreation activities; views about project additions in the context of large-scale projects and about water companies' general approach to planning.

Section 0 presents WTP value estimates for each of the project additions explored in the survey, including sensitivity, segmentation, and validity analyses as well as valuations by type of site and by distance. These estimates are based on an econometric analysis of responses to the SP1 pairwise choice exercise, details of which are included in Appendix C.

Section 3.4 presents valuations for a 'package' of project additions, which are based on an analysis of responses to the SP2 contingent valuation questions and are intended as a cap on the total cost of project additions across SROs at the company level.

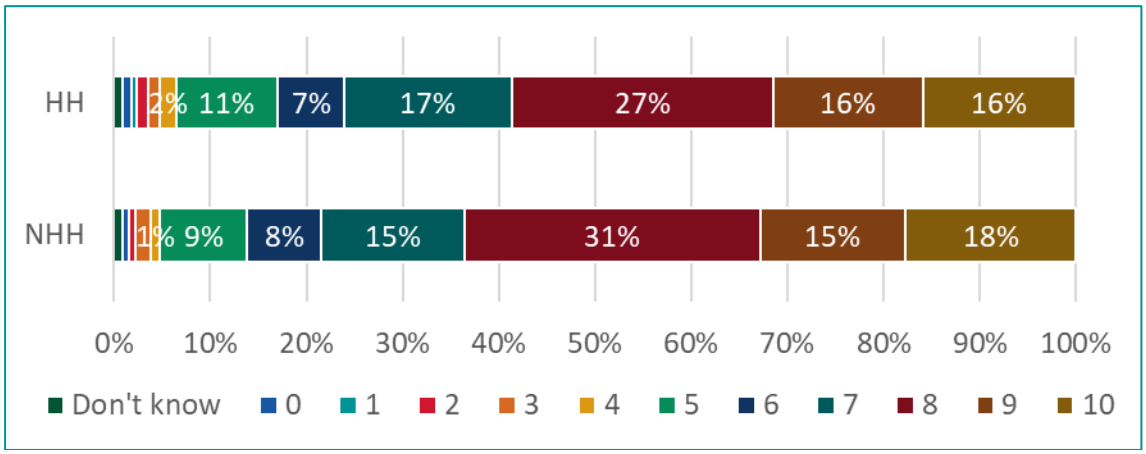
Finally, Section 3.5 describes the aggregation of the valuations of individual project additions by type of site, company, and distance, to the respective population for three SROs.

3.2 Descriptive Findings

Customer Satisfaction

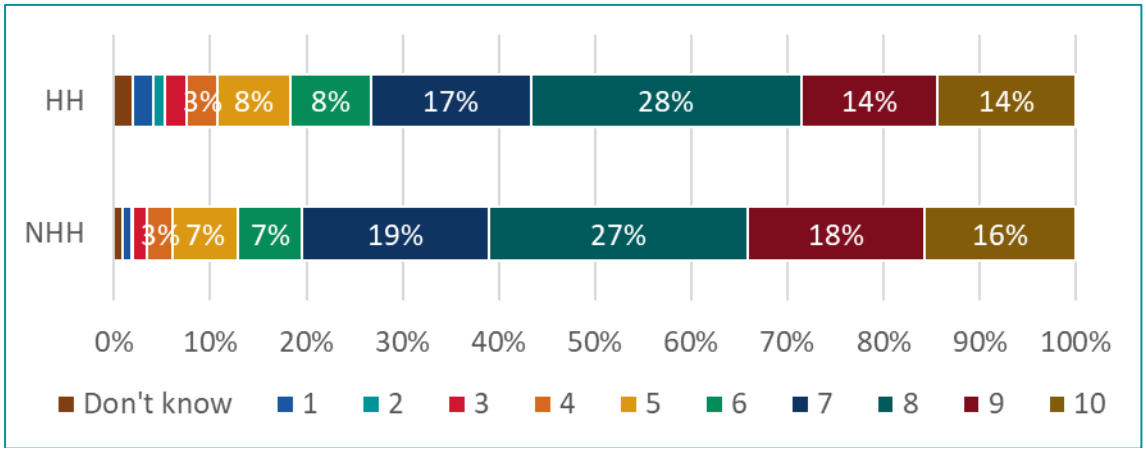
Nearly 60% of households and over 60% of non-households gave a satisfaction rating of between 8 and 10 (on a 0-10 scale). Customer satisfaction was quite similar among household and non-household customers (Figure 8). Trust ratings were quite similar to satisfaction ratings and did not differ much between household and non-household customers (Figure 9).

Figure 8: Overall customer satisfaction



Base: Household = 5,902; Non-household = 553. Q21. How satisfied would you say you are with the overall service provided by your water company? 0 = Extremely dissatisfied. 10 = Extremely satisfied. The overall percentages rating satisfaction 0 to 3 were 3.9% among households and 2.9% among non-households.

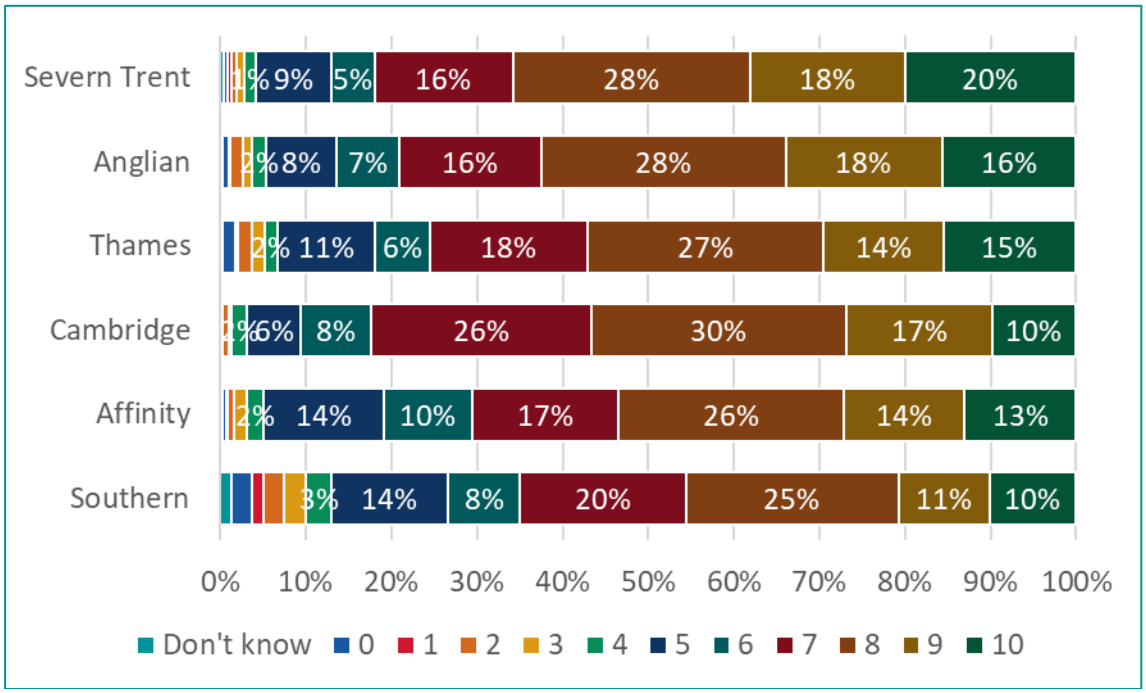
Figure 9: Trust in the water company



Base: Household = 5,902; Non-household = 553. Q22. How much do you trust your water company? 1 = I don't trust them at all. 10 = I trust them completely. The overall percentages rating trust 1 to 3 were around 6% among households and 2.5% among non-households.

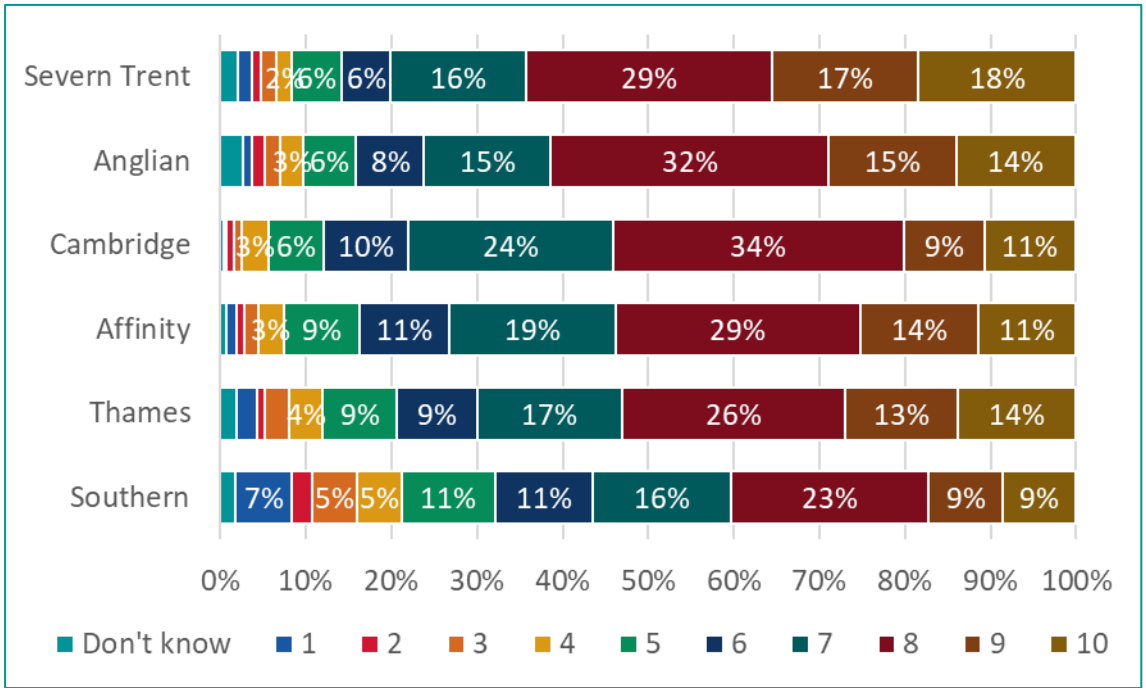
There was considerable variation in overall satisfaction and trust ratings across companies, as shown in Figure 10. Severn Trent leads the ranking with around 66% rating satisfaction between 8 to 10, while only 46% of Southern customers are found in that category. The picture is very similar for trust in the water company (Figure 11). The gap in terms of the share of customers rating trust at 8, 9 or 10 between Severn Trent and Southern increases to around 24 percentage points.

Figure 10: Overall customer satisfaction by company (households)



Base: Affinity = 1,055. Anglian = 1,175. Cambridge = 280. Severn Trent = 1,184. Southern = 1,027. Thames = 1,181. Q21. How satisfied would you say you are with the overall service provided by your water company? 0 = Extremely dissatisfied. 10 = Extremely satisfied.

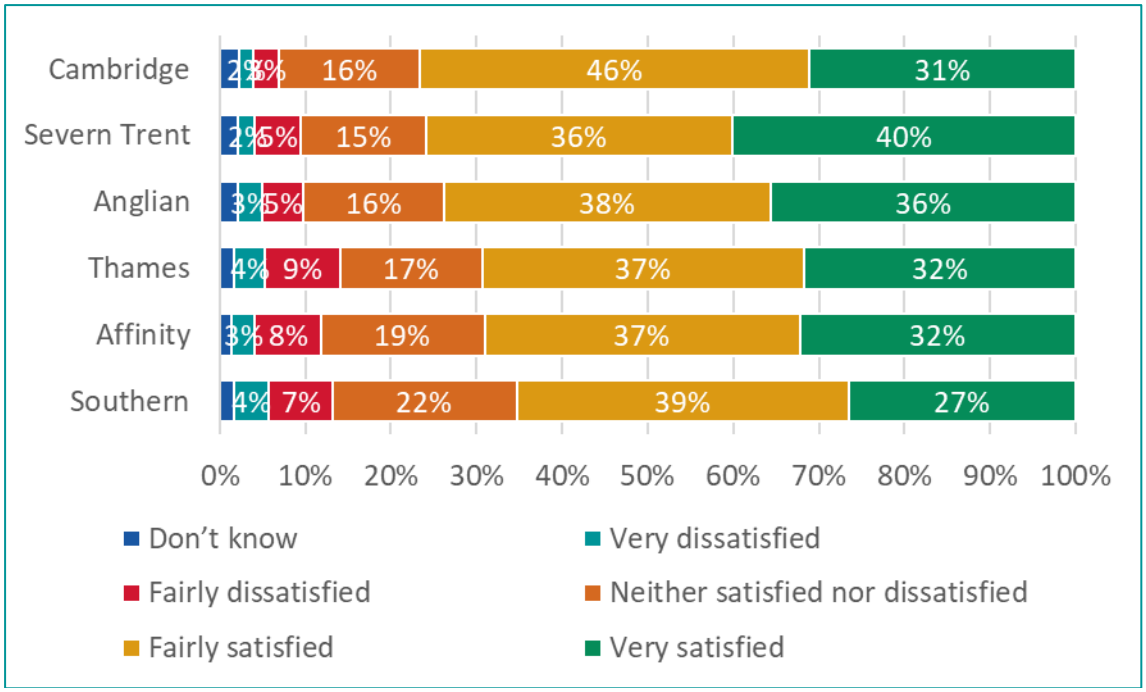
Figure 11: Trust in the water company by company (households)



Base: Affinity = 1,055. Anglian = 1,175. Cambridge = 280. Severn Trent = 1,184. Southern = 1,027. Thames = 1,181. Q22. How much do you trust your water company? 1 = I don't trust them at all. 10 = I trust them completely.

Finally, Figure 12 shows the level of satisfaction with value for money by company. While Southern ranks worst also in terms of number of customers who are fairly or very satisfied with value for money, the percentage-gap between top and bottom ranked companies is notably smaller than for trust and overall satisfaction.

Figure 12: Satisfaction with value for money by company (households)



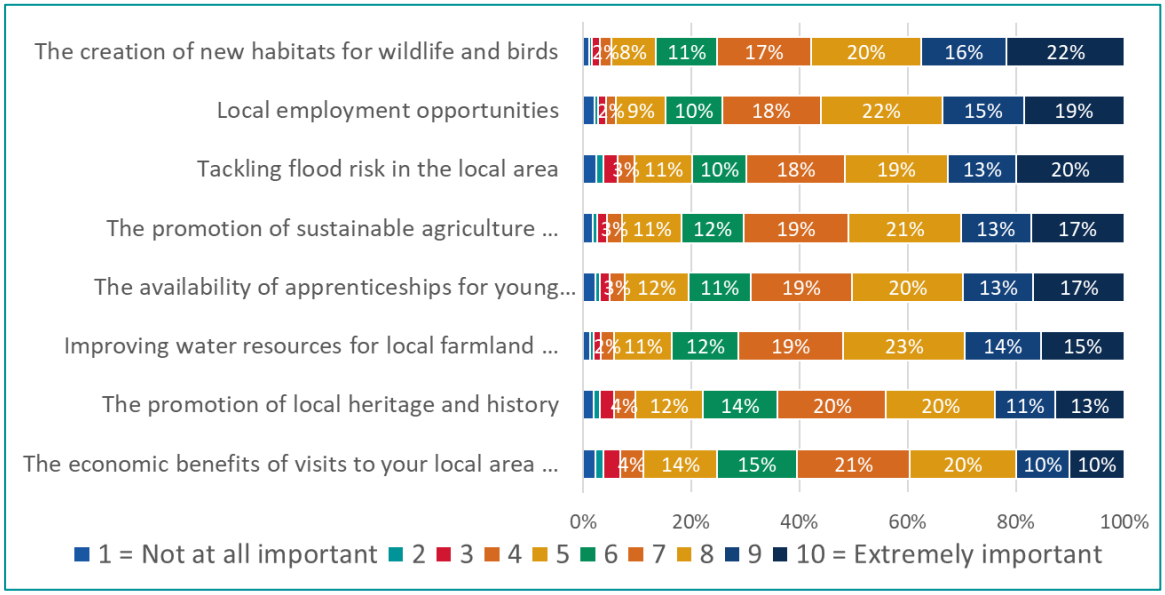
Base: Affinity = 985. Anglian = 1,107. Cambridge = 198. Severn Trent = 1,115. Southern = 970. Thames = 1,114 (online panel only). Q26. How satisfied are you with the value for money of the clean water services you receive?

Attitudes

Households and non-households held similar views regarding the most important aspects relating to their local environment. 'The creation of new habitats for wildlife', 'Local employment opportunities' and 'Tackling flood risk in the local area' had the highest percentages in the top two importance scores, while 'The promotion of local heritage' and 'The economic benefits of visits to your local area' ranked at the bottom.

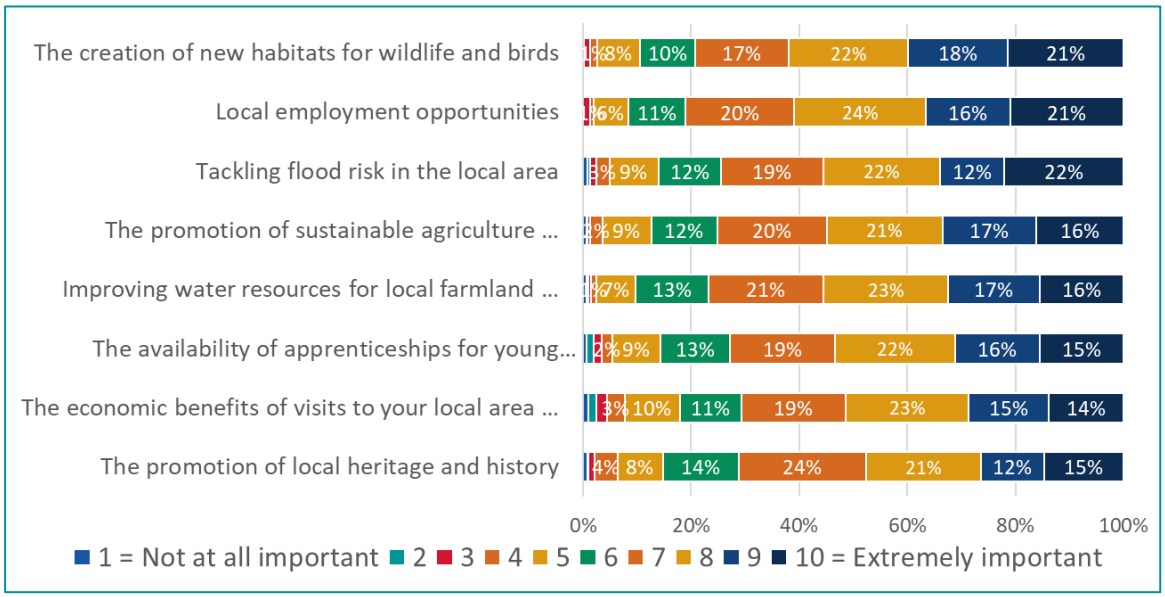
These aspects closely match a subset of the project additions included in the pairwise choice exercise, and, hence, the comparison between attitudes and valuations offers a powerful means of testing the validity of the valuations derived from the choice exercise.

Figure 13: Households' views about various aspects relating to their local area



Base: 5,902 participants. Q27. How important to you are each of the following?

Figure 14: Non-households' views about various aspects relating to their local area

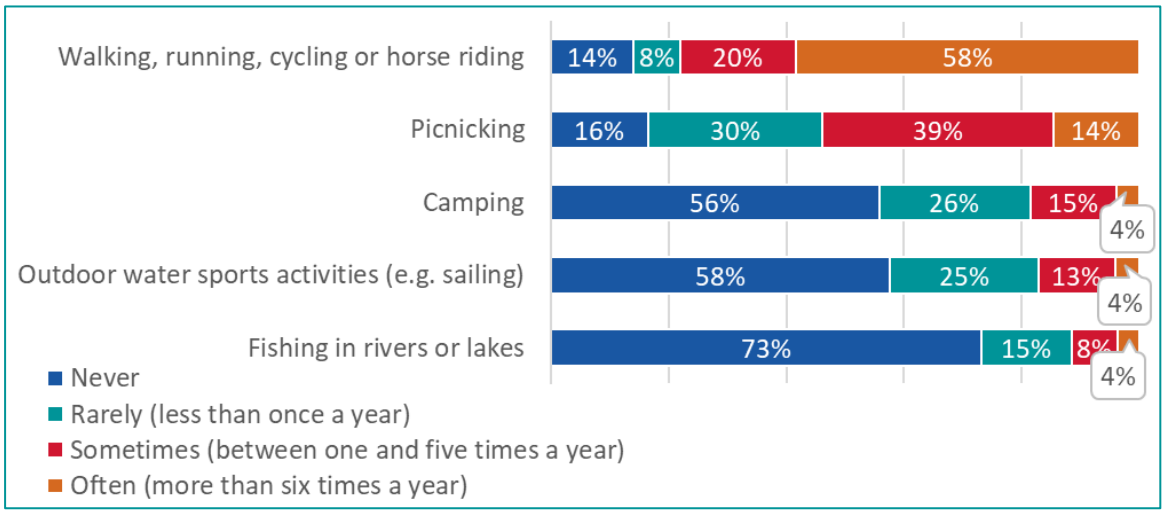


Base: 553 participants. Q27. How important to you are each of the following?

Recreation

Nearly 60% of household participants go walking, running, etc. at least six times a year. These were the most popular outdoor activities, followed by picnicking, 53% having a picnic at least once a year. The proportions of those who regularly go camping, sailing, fishing etc. are considerably smaller. Hence, project additions such as 'Campsite', 'Water sports facilities' and 'Fish ponds' are likely to appeal to a small fraction of the customer base only.

Figure 15: Household participants' engagement in outdoor recreation activities



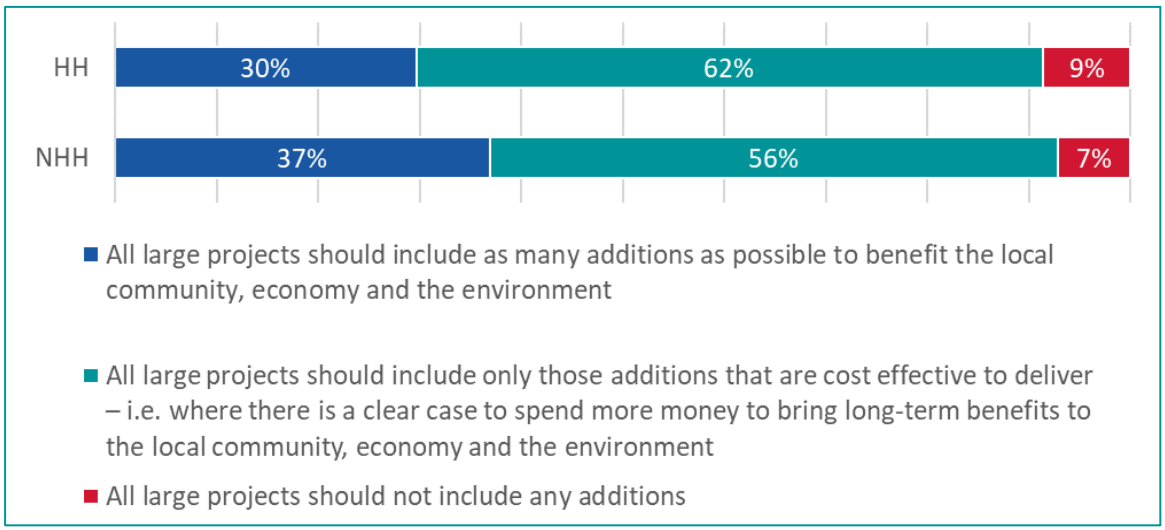
Base: 5,901 participants. Q28. How often do you, or does anyone in your household, do the following recreation activities?

Planning for the Future

Following the SP exercises, participants were asked to express their views about project additions in the context of large-scale projects as well as their reaction to some key trade-offs in terms of the water companies' general approach to planning and where they stood stand on each.

The vast majority of both household and non-household participants were in favour of project additions provided the wider benefit exceeded the cost as shown in Figure 16. A relatively large fraction supported the idea of including as many additions as possible, while only a small minority were categorically opposed to project additions in the context of large-scale projects.

Figure 16: Participants' general view about project additions

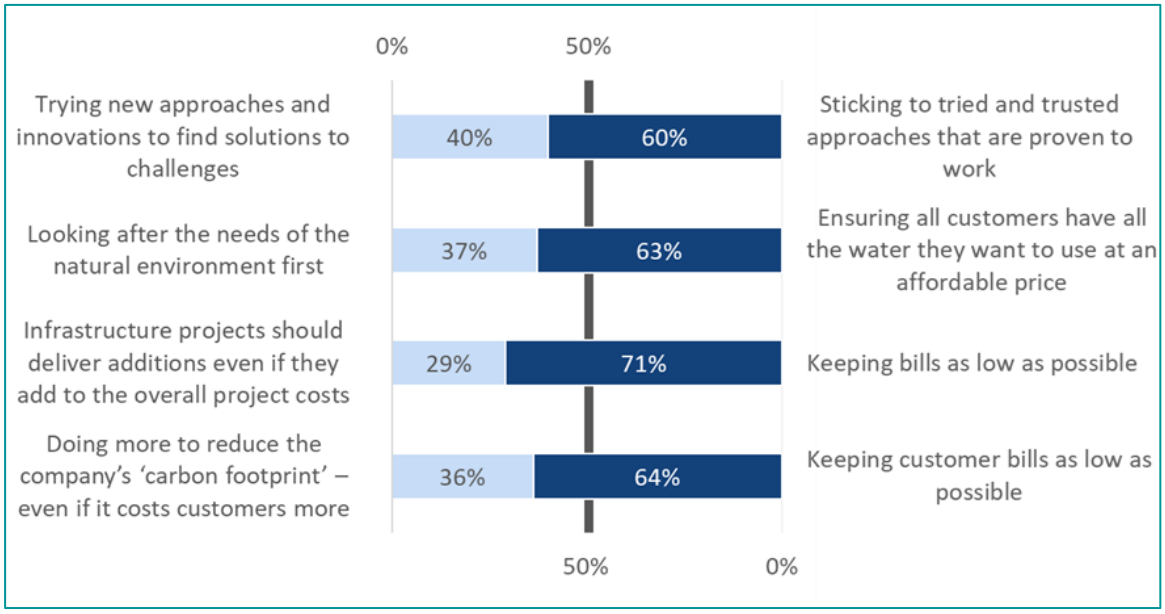


Base: Household = 5,818; Non-household = 535. Q47B. Which of the following best describes how you feel about project additions when large infrastructure projects are being undertaken (such as building a new reservoir, water treatment works, etc).

Regarding some major trade-offs involved in planning for the future, both household and non-household participants tended to prefer the preservation of the 'status quo' positioning themselves closer to the 'conservative' end of the spectrum, preferring 'tried and trusted approaches' to 'trying new approaches' and 'keeping bills as low as possible' over new spending for project additions and for measures to reduce the companies' carbon footprint (see Figure 17). The overall pattern of responses is very similar between households and non-households.

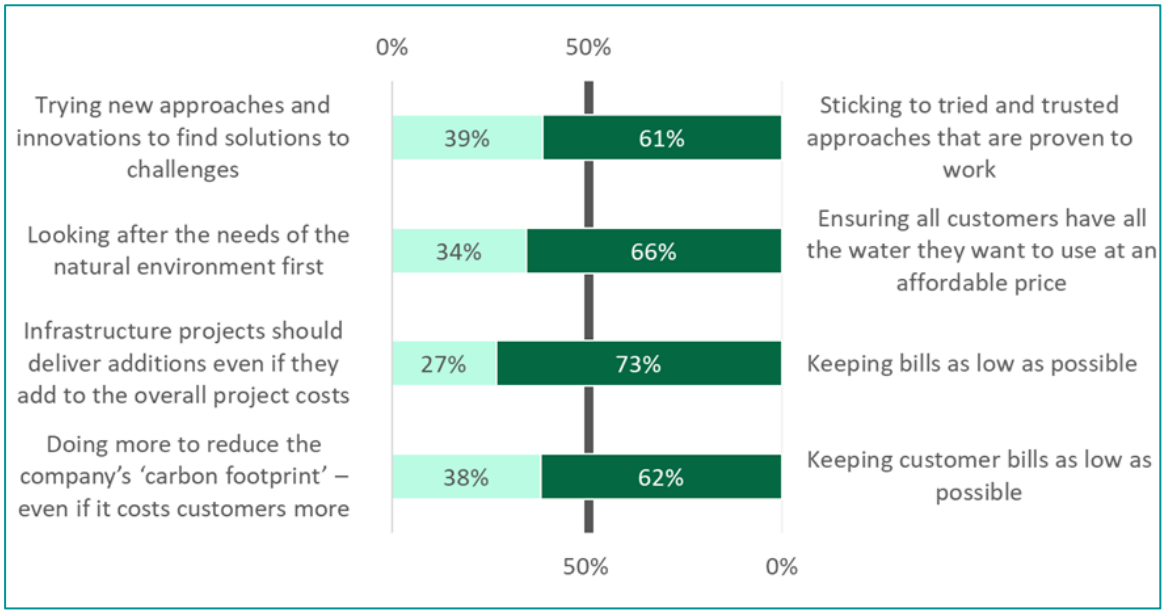
Over 70% of household participants preferred keeping bills as low as possible to seeing project additions add to the cost of infrastructure projects (Figure 17), while, in the preceding question, only around 10% of household participants were against all project additions, regardless of any cost-benefit considerations (Figure 16). This apparent contradiction may indicate that customers consider that cost-benefit considerations should play a major role in future planning.

Figure 17: Households' views in relation to major trade-offs involved in planning for the future



Base: 5,818 (question not included in the pilot survey). Percentage positioning the slider closer to the left/right end of the spectrum. Q47C. We'd like to understand your reaction to some key trade-offs in terms of the companies general approach to planning and where you stand on each. Please indicate the point on the scale that most closely reflects how you feel.

Figure 18: Non-households' views in relation to major trade-offs involved in planning for the future



Base: 535 (question not included in the pilot survey). Percentage positioning the slider closer to the left/right end of the spectrum. Q47C. We'd like to understand your reaction to some key trade-offs in terms of the companies general approach to planning and where you stand on each. Please indicate the point on the scale that most closely reflects how you feel.

3.3 Valuations of Individual Project Additions

Introduction

This section presents WTP value estimates for each of the project additions explored in the survey. The next subsection contains our main WTP estimates for household and non-household customers. This is followed by a presentation of sensitivity, segmentation, and validity analysis.

The last two subsections present WTP estimates by type of site (reservoir, canal, water treatment works, pipeline) and by distance from customers' homes/premises.

Valuations of Project Additions Nearby

The valuations presented here were derived via an econometric analysis of the SP1 pairwise choice data, details of which are given in Appendix C. The modelling approach can be characterised as stepwise, general-to-specific modelling. The initial general model for households allows for differences in WTP:

- across companies via bill × company interactions
- by type of site via bill × site interactions and project-addition-specific terms
- by distance via bill × distance × site interactions and project-addition-specific terms.

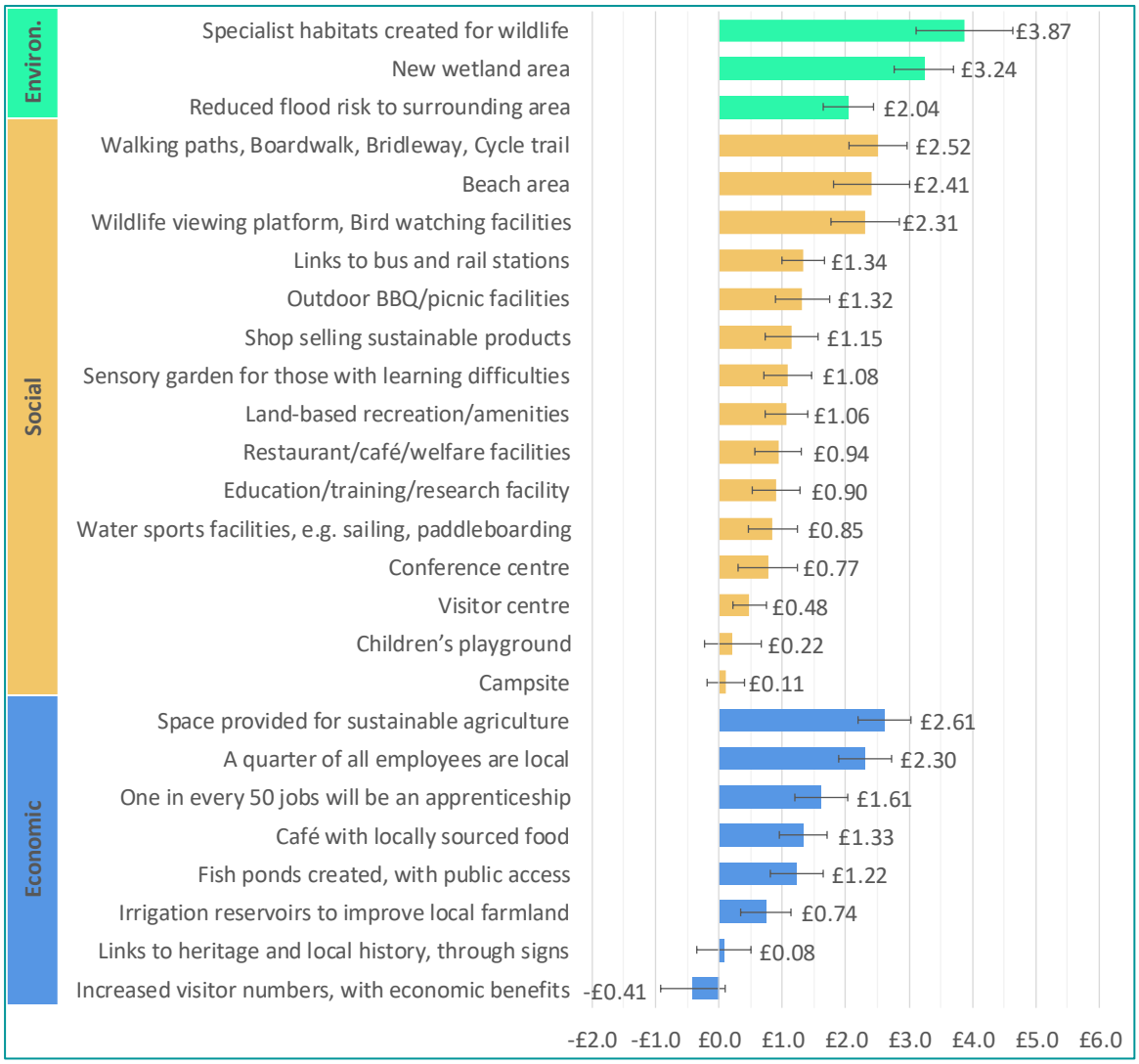
The general model was reduced by excluding insignificant coefficients in a stepwise procedure to obtain more precise value estimates. The same approach was followed for non-households but using a simpler specification for the initial model.

Figure 19 shows household customers' WTP for project additions at sites 5 miles from home, calculated as a population-weighted average across companies and types of sites. While WTP was positive for most project additions, it was not statistically different from zero for 'Children's playground', 'Campsite', 'Links to heritage and history', and 'Increased visitor numbers'. The highest-valued project additions were:

- Specialist habitats created for wildlife (£3.87 annually)
- New wetland area (£3.24 annually)
- Space provided for sustainable agriculture (£2.61 annually)

The average valuation of any project addition was considerably higher in the environmental area (£3.05), compared to the economic area (£1.19) and the social area (£1.16). The combined valuation of all project additions was £36.12.

Figure 19: Average valuations of project additions nearby: households



Base: 5,902 participants. Annual WTP in terms of a higher water bill for project additions at sites 5 miles from home. Population-weighted average across companies and types of sites. The error bars show 95% confidence intervals calculated using the delta method.

The high WTP values for environmental project additions are consistent with the qualitative research findings. The narrative of supporting wildlife/new wetlands/habitats was found to resonate strongly with customers across water companies. The relatively high WTP for 'Space for sustainable agriculture' among the group of project additions in the economic area appears to be linked to the high valuations of project additions in the environmental area[5]. The full description as seen by participants—'Space provided for sustainable agriculture, including regenerative farming and re-wilding'—is centred on environmental themes, and many of the reasons given by participants for choosing an option that included 'Space for sustainable agriculture' suggest that environmental concerns were a key driver of participants' choices (see Table 7).

[5] Note, however, that the WTP for 'Space for sustainable agriculture' is not statistically different from the WTP for 'A quarter of all employees are local'.

Table 7: Selected reasons for choosing options that included 'Space for sustainable agriculture'

Open response
It appeared to be more natural and less disruptive of nature
more natural and enjoyable
We badly need sustainable farming, conference centres are ten a penny!
Because I feel that sustainable farming will be more beneficial to the environment than tourist attractions
Because it had greater beneficial environmental impact
I think we have done enormous damage t the environment in recent years and this would be an opportunity to regenerate some of what we have lost
Wildlife is important
Better for the environment
It was cheaper and seemed better for the local environment. Increased visitors on the other option means more issues .
I prefer it because it seems more friendly to the environment, not only about attracting more people, but also cheaper
More eco friendly And sustainable
it is important to support nature and provide the habitats required
Had a better impact in the environment
Picked it for the rewilding. Essentially was a choice between that and the reduced flood risk - both of those are more important than the other aspects. The difference in price is negligible

Note: Selected reasons for choosing options that included 'Space for sustainable agriculture' in the first SP1 choice question.

More generally, project additions that were seen as more relevant/more important in the qualitative stage, rank in the top third in terms of WTP, while the less relevant/less important project additions rank in the bottom two-thirds, the only exception being 'Beach area'. This indicates a high degree of consistency between qualitative and quantitative findings[6].

Figure 20 shows non-household customers' average WTP across types of sites for project additions 5 miles from their organisation's premises. WTP estimates are substantially less precise than for households, as shown by relatively wider confidence intervals than for households. This reflects both a considerably smaller sample and a worse fit to the data of the non-household model compared to the household model (see Appendix C). While WTP was positive for most project additions, it was not statistically significant for 8 out of 26 project additions.

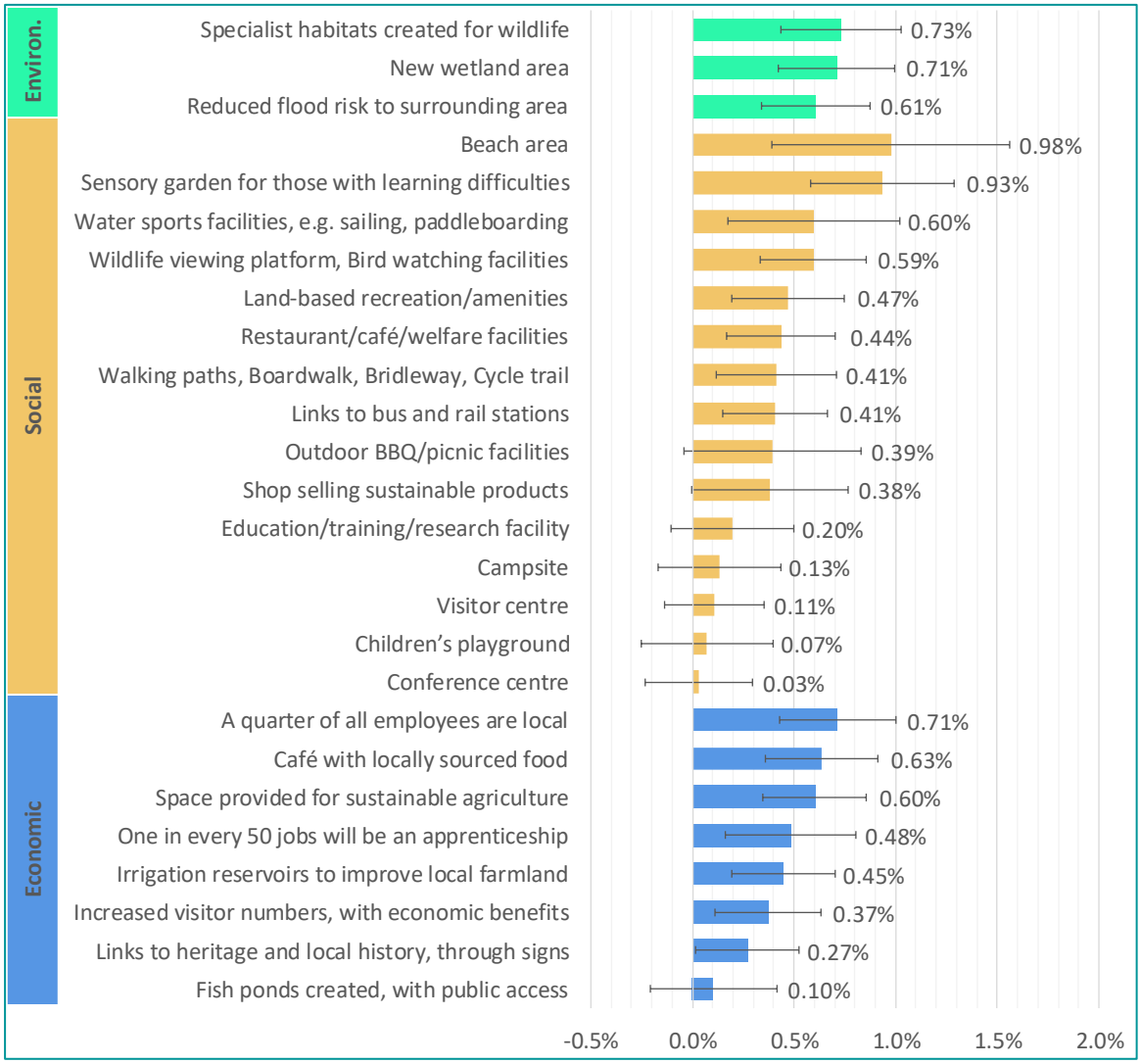
The most highly valued project additions were:

- Beach area (0.98% of the annual water only bill)
- Sensory garden for those with learning difficulties (0.93% of the annual water only bill)
- Specialist habitats created for wildlife (0.73% of the annual water only bill)

As for households, the average valuation of any project addition was substantially higher in the environmental area (0.68% of the bill), compared to the economic area (0.45%) and the social area (0.41%). The combined valuation of all project additions was 11.83% of the annual water only bill.

[6] The low *average* valuation of 'Water sports facilities' is explained by the fact that while those who regularly engage in outdoor water sports activities have a relatively high WTP, they make up a small proportion of the customer base (see Table 10 and Figure 15).

Figure 20: Average valuations of project additions nearby: non-households



Base: 553 participants. Average annual WTP, across types of sites, for project additions at sites 5 miles from the organisation's premises expressed as a percentage of the annual water only bill. The error bars show 95% confidence intervals calculated using the delta method.

The relative WTP values of non-household customers may seem surprising in some cases such as 'Beach area' and 'Sensory garden' being the most highly valued project additions. However, the estimates are subject to a relatively wide margin of error. For example, the difference in WTP between 'Beach area' and 'Increased visitor numbers' is not quite statistically significant at the 5% level.

Moreover, many project additions appear to be specifically targeted at and relevant to households only, and, therefore, the stated preferences are likely to be a combination of household and non-household preferences, as well as reflecting the preferences of organisations that are very heterogeneous in terms of sector of activity.

Sensitivity analysis

While the proportion of participants who stated that they were not able to understand the choices was negligible, somewhat larger proportions did not find the options believable or did not find it easy to choose between the options (see Figure 6). It would not be appropriate, in our view, to exclude such participants from the estimation sample as their responses are still potentially valid. For example, many of those who stated that they did not find it 'easy to choose between the options' indicated that both options had benefits, that both were good, or that there were pros and cons to both.

These difficulties are inherent in such choice exercises and do not automatically imply that the responses are invalid. Therefore, we followed best practice recommendations in the environmental valuation literature[7] by testing the sensitivity of our WTP estimates to reasonable sample exclusions focussing on nearby project additions (5 miles from home/premises).

We compared the valuations of those who (strongly) agreed that they were able to understand the choices, that the options were believable, and that it was easy to choose between the options, representing 59% and 60% of the household and non-household samples, respectively, against the valuations of those who did not[8]. For both households and non-households, we found that those who gave positive feedback to the pairwise choice exercise had a higher WTP for most project additions[9] than those who gave negative feedback on at least one follow-up question. However, the difference was statistically significant for three project additions only. We retain the full sample for our analyses because the evidence is weak, overall, that WTP differs substantially between the two groups of participants and because the full sample generally yields more conservative estimates.

Segmentation analysis

A segmentation analysis is useful to explore how preferences vary across the population. Table 8 shows what customer segments were covered in the analysis, providing full definitions where appropriate. The table also includes the household segments covered in the expectation-based validity analysis which is presented in the next subsection. Each segment's WTP was compared against the WTP of the complement segment 'Other' (for example, social grades A/B vs C1/C2/D/E combined) testing for statistically significant differences. The valuations were derived by re-estimating the main household model (see Appendix C) allowing each coefficient to differ between any segment and the complement segment.

[7] For example, Johnstone, R. J. et al (2017) Contemporary Guidance for Stated Preference Studies, *Journal of the Association of Environmental and Resource Economists*, 4(2), 319-405.

[8] These valuations were derived by re-estimating the household/non-household model allowing each coefficient to differ between those who gave positive feedback to the choice exercise and those who did not.

[9] Households: 23 project additions (out of 26). Non-households: 20 project additions.

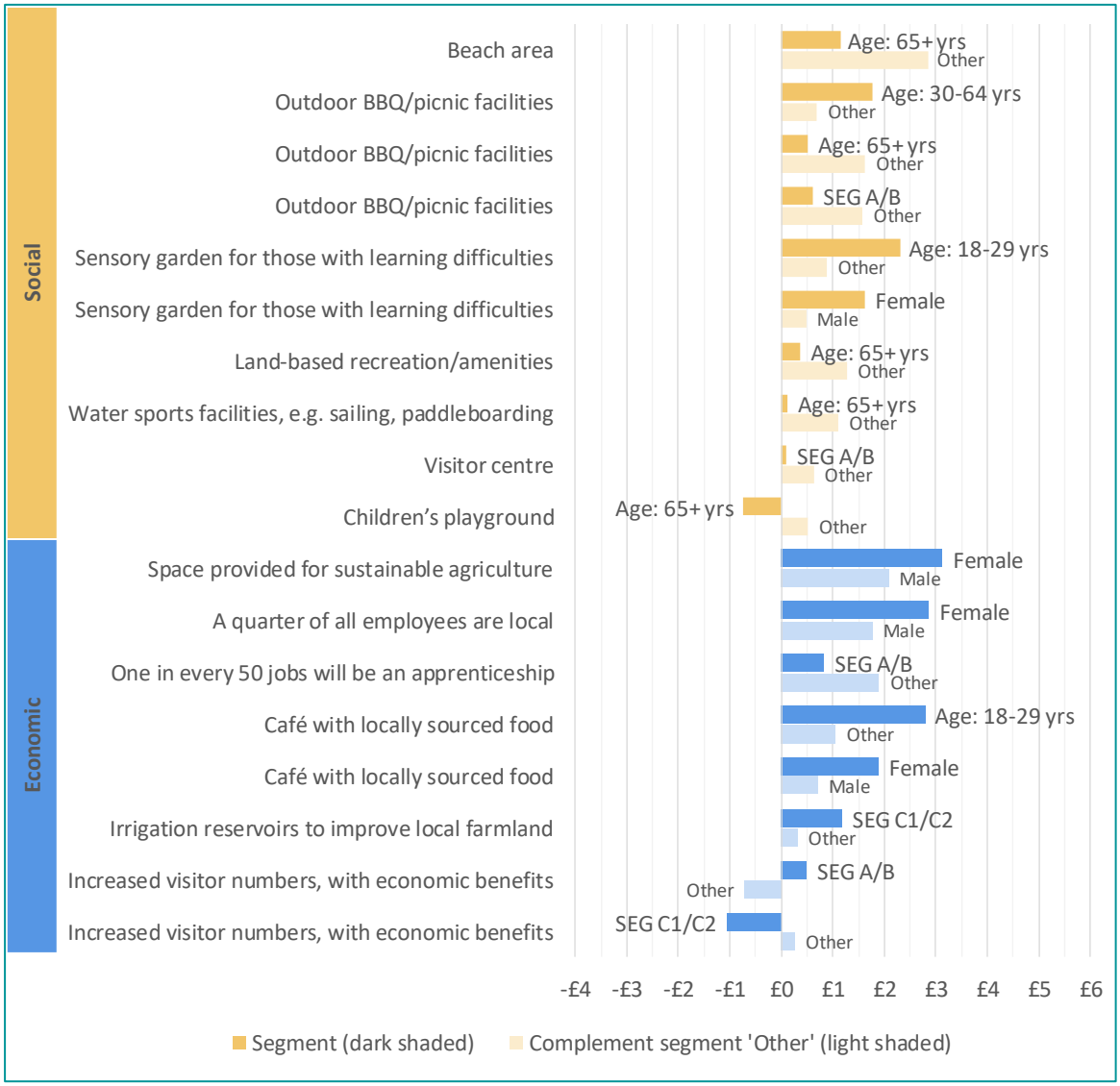
Table 8: Household customer segments

Segment	Definition
Age: 18-29 yrs	
Age: 30-64 yrs	
Age: 65+ yrs	
Male	
Female	
SEG A/B	Social grade A/B
SEG C1/C2	Social grade C1/C2
SEG D/E	Social grade D/E
Income up to £442 pw	Household income up to £442 per week
Income £443-£721 pw	Household income £443-£721 per week
Income £722+ pw	Household income £722+ per week
Water bill: always on time	'I always pay my water bill, and other household bills, on time'
Water bill: struggling	'I always pay my water bill on time, but sometimes struggle, or am late, paying other bills' or 'I sometimes pay my water bill late'
Water bill: in debt	'I often find it difficult to pay my water bill on time' or 'I am rarely, or never, able to pay my water bill on time'
Children aged 0-10 yrs	Household with children aged 0-10
Children aged 0-15 yrs	Household with children aged 0-15
Water sports	Outdoor water sports (anyone in household): at least once a year
Fishing	Fishing in rivers or lakes (anyone in household): at least once a year
Picnicking	Picnicking (anyone in household): at least once a year
Walking, running, …	Walking, running, cycling or horse riding (anyone in household): at least once a year
Camping	Camping (anyone in household): at least once a year
Additions: as many as possible	Large projects should include as many additions as possible
Additions: cost effective only	Large projects should include only additions that are cost effective
Additions: none	Large projects should not include any additions

Figure 21 focuses on significant differences in valuations across household segments defined based on age, gender, and social grade (at the 5% level). The figure shows the following findings:

- There were no significant differences in WTP for environmental project additions.
- Older customers had lower valuations than younger customers of the following project additions: 'Beach area', 'Outdoor BBQ/picnic facilities', 'Land-based recreation/ amenities', 'Water sports facilities', and 'Children's playground'. It seems plausible that these should be more appealing to younger customers.
- Conversely, younger customers had a higher WTP for 'Sensory garden for those with learning difficulties' and 'Café with locally sourced food'.
- Female customers were willing to pay more than male customers for some socially and environmentally beneficial additions such as 'Sensory garden for those with learning difficulties' and 'Space provided for sustainable agriculture'.

Figure 21: Significant differences in WTP across household segments



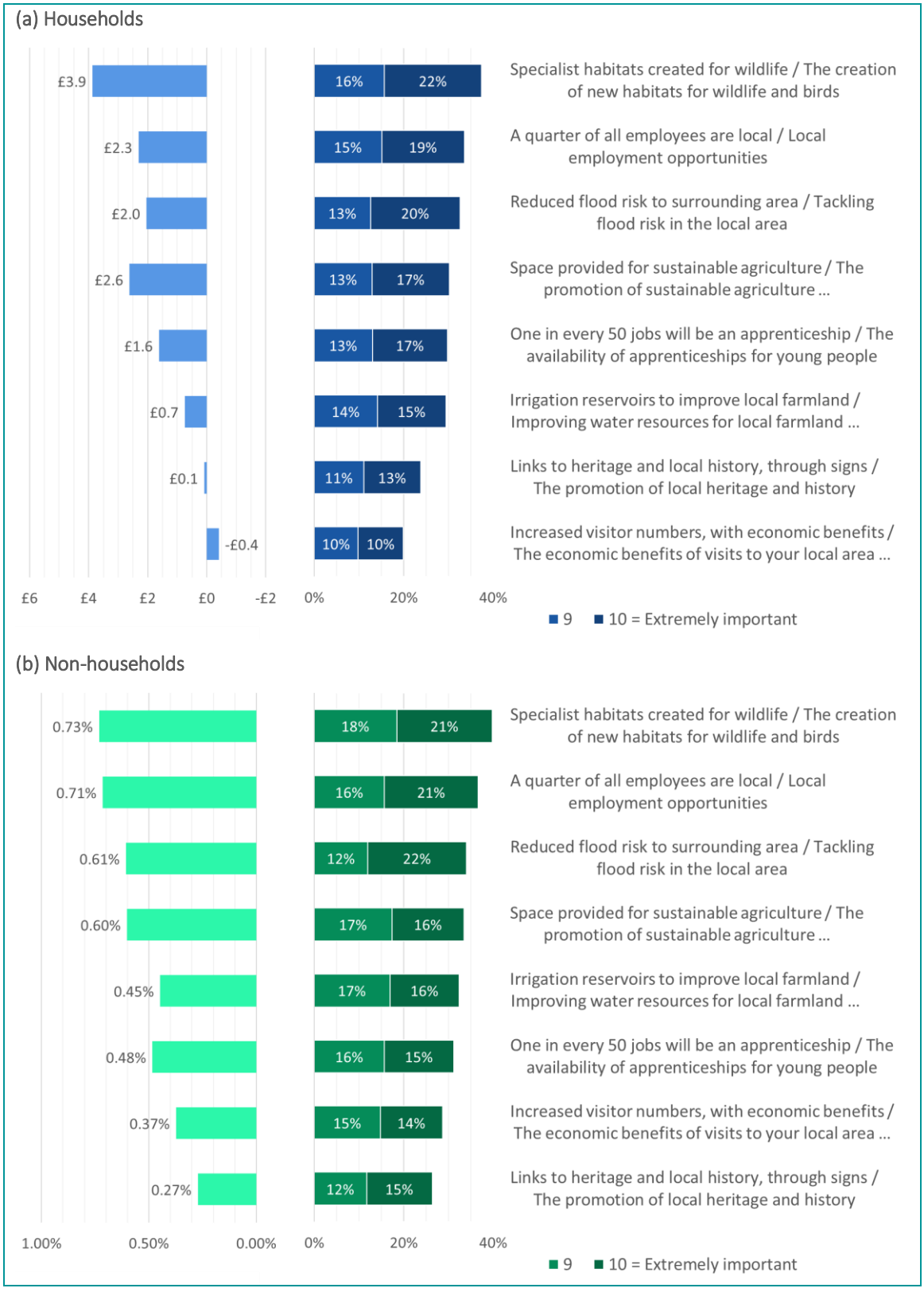
Expectation-based validity analysis

We tested the validity of our analysis by exploring the correlation between valuations and attitudes and by testing for differences in WTP between segments defined based on a) participants' opinions regarding project additions when large infrastructure projects are being undertaken (household and non-household); b) participants' outdoor recreation activities (household); c) household characteristics such as income, financial situation, and age composition (household); d) business sector (non-household); c) role of the participant in the organisation (non-household). The relevant non-household segments are shown in Table 12. (See Table 8 for the definitions of household segments.)

Figure 22 compares the valuations of a subset of project additions covered in the pairwise choice exercise against the stated importance of closely linked aspects of the local environment. The rank correlation between the two is very high for both households (0.93 on a 0-1 scale) and non-households (0.98), meaning that project additions related to aspects that are seen as highly important tend to be valued more highly and vice versa. The high degree of

consistency between the valuations inferred from the participants' choices and their views about aspects of the local environment provides supports the validity of the valuation exercise.

Figure 22: Correlation between valuations and attitudes



Base: Households = 5902; Non-households = 553. Left panel: valuations of project additions. Right panel: percentage in the top two importance categories (9 and 10 on a 1-10 scale). Labels: description of project addition / topic description for attitude question 'How important to you are each of the following?'.

The following tables show significant differences in WTP, at the 5% level, between various household customer segments. Green (red) cells indicate that customers in the relevant segment had a statistically higher (lower) WTP for a given project addition than customers in the corresponding complement segment 'Other'. For example, households with children aged 0-10 years had a considerably higher WTP for 'Children's playground' than households without any children or any children of that age. (See Table 8 for the exact definition of each segment.)

Table 9: Significant differences in valuations by view about project additions

Segment	Attribute	Segment WTP	WTP complement ('other')
Additions: as many as possible	Walking paths, Boardwalk, Bridleway, Cycle trail	£3.8	£2.2
	Beach area	£4.1	£2.0
	Space provided for sustainable agriculture	£3.5	£2.4
	Links to heritage and local history, through signs	£1.3	-£0.3
Additions: cost effective only	Land-based recreation/amenities	£1.4	£0.5
	Irrigation reservoirs to improve local farmland	£1.1	£0.2
	Links to heritage and local history, through signs	-£0.3	£0.7
Additions: none	Specialist habitats created for wildlife	£1.7	£4.2
	New wetland area	£1.5	£3.6
	Reduced flood risk to surrounding area	£1.0	£2.3
	Walking paths, Boardwalk, Bridleway, Cycle trail	£1.5	£2.8
	Wildlife viewing platform, Bird watching facilities	£1.2	£2.6
	Sensory garden for those with learning difficulties	-£0.1	£1.2
	Restaurant/café/welfare facilities	-£0.1	£1.1
	Water sports facilities, e.g. sailing, paddleboarding	£0.1	£1.1
	Visitor centre	£0.0	£0.6
	Space provided for sustainable agriculture	£1.2	£2.9
	A quarter of all employees are local	£0.8	£2.6
	Café with locally sourced food	£0.6	£1.5
	Irrigation reservoirs to improve local farmland	-£0.1	£0.9

Note: Green (red) cells indicate that customers in the relevant segment had a statistically higher (lower) WTP for a given project addition (at a 5-mile distance from home) than customers in the corresponding complement segment 'Other'.

Table 10: Significant differences in valuations by recreation activity

Segment	Attribute	Segment WTP	WTP complement ('other')
Walking, running, …	Walking paths, Boardwalk, Bridleway, Cycle trail	£2.8	£1.8
Picnicking	New wetland area	£3.8	£2.8
	Outdoor BBQ/picnic facilities	£1.8	£0.9
	Restaurant/café/welfare facilities	£1.4	£0.5
	Education/training/research facility	£1.3	£0.5
	Children's playground	£0.9	-£0.4
	A quarter of all employees are local	£2.8	£1.8
	Café with locally sourced food	£1.9	£0.8
Water sports	Water sports facilities, e.g. sailing, paddleboarding	£2.6	£0.6
	Campsite	-£1.2	£0.3
Fishing	Outdoor BBQ/picnic facilities	£3.8	£1.1

Note: Green (red) cells indicate that customers in the relevant segment had a statistically higher (lower) WTP for a given project addition (at a 5-mile distance from home) than customers in the corresponding complement segment 'Other'.

Table 11: Significant differences in valuations by household characteristic

Segment	Attribute	Segment WTP	WTP complement ('other')
Income up to £442 pw	New wetland area	£2.5	£3.8
	Sensory garden for those with learning difficulties	£0.6	£1.4
	Land-based recreation/amenities	£0.5	£1.5
	A quarter of all employees are local	£1.3	£2.8
	Links to heritage and local history, through signs	-£0.6	£0.5
Income £443-£721 pw	Sensory garden for those with learning difficulties	£1.8	£0.9
	Links to heritage and local history, through signs	£1.1	-£0.2
Income £722+ pw	Land-based recreation/amenities	£1.8	£0.7
	A quarter of all employees are local	£3.0	£1.8
Water bill: in debt	Specialist habitats created for wildlife	£2.1	£3.9
	New wetland area	£1.7	£3.3
	Walking paths, Boardwalk, Bridleway, Cycle trail	£0.4	£2.6
	Space provided for sustainable agriculture	£0.9	£2.7
	Increased visitor numbers, with economic benefits	£1.1	-£0.4
Children aged 0-10 yrs	Beach area	£3.9	£2.1
	Outdoor BBQ/picnic facilities	£2.7	£1.1
	Water sports facilities, e.g. sailing, paddleboarding	£2.1	£0.6
	Children's playground	£2.0	-£0.2
Children aged 0-15 yrs	Outdoor BBQ/picnic facilities	£2.3	£1.1
	Water sports facilities, e.g. sailing, paddleboarding	£1.8	£0.5
	Children's playground	£1.8	-£0.3

Note: Green (red) cells indicate that customers in the relevant segment had a statistically higher (lower) WTP for a given project addition (at a 5-mile distance from home) than customers in the corresponding complement segment 'Other'.

The pattern of differences in valuations across household segments is strongly supportive of the validity of the WTP values derived from the pairwise choice exercise. In the vast majority of cases, statistically significant differences in WTP between segments meet *a priori* expectations regarding the sign of the difference.

- Those who would like to see as many project additions as possible being delivered had a substantially higher WTP for a number of additions than those who only want cost-effective additions being delivered or those who believe large projects should not include any additions, including for 'Links to heritage and local history', which was of very limited appeal to the wider customer base

- Those who engage in outdoor recreation activities at least once a year tended to have a higher WTP for project additions related to their outdoor activities:

- Those who go walking, running, cycling or horse riding had a higher WTP for 'Walking paths, Boardwalk, Bridleway, Cycle trail'.

- Those who enjoy picnicking had a higher WTP for 'Outdoor BBQ/picnic facilities', 'Children's playground', 'Café with locally sourced food'.

- Those who engage in water sports had a higher WTP for 'Water sports facilities, e.g. sailing, paddleboarding'.

- Low-income households had a lower WTP for all project additions compared to higher-income households, the difference being statistically significant for several project additions. Similarly, those who were finding it difficult to pay their water bill on time had a lower WTP for a number of project additions compared to those who were not (except as regards 'Increased visitor numbers, with economic benefits')

- Finally, households with young children valued the following more highly, as expected: 'Beach area', 'Outdoor BBQ/picnic facilities', 'Water sports facilities, e.g. sailing, paddleboarding', and 'Children's playground'.

A similar analysis was performed for non-households covering the segments shown in Table 12. Given the considerably smaller sample size and the relatively large number of variables included in the model, we decided to set the level of significance at 10%.

Table 12: Non-household customer segments

Segment	Definition
Sector: educ., health, etc	Business sector: Education (including schools, universities); Health and social work (including hospitals, doctors, dentists. charities, nursing care)
Sector: retail, hotel, etc	Business sector: Retail (NOT hairdressing), Wholesale, Motor Trades including vehicle repair; Hotel, catering, Camp sites, restaurants, cafes, accommodation, pubs; Arts, Recreation, Entertainment (including Libraries, theatres, museums, zoos, sport centres, fitness);
Role: general management	The participant works in general management (eg CEO, MD, General Manager)
Role: some high-level role	The participant's role coded based on the job title (open responses): e.g., CEO, partner, CFO, director-level roles
Additions: as many as possible	Large projects should include as many additions as possible
Additions: cost effective only	Large projects should include only additions that are cost effective
Additions: none	Large projects should not include any additions

Significant differences in valuations across non-household segments are shown in Table 13. These tend do make intuitive sense, although *a priori* expectations are harder to formulate for non-household customers because many project additions appear to be specifically targeted at and relevant to households only.

Table 13: Significant differences in valuations across non-household segments

Segment	Attribute	Segment WTP	WTP complement ('other')
Sector: Educ., health, etc	Outdoor BBQ/picnic facilities	1.31%	0.13%
Sector: Educ., health, etc	Water sports facilities, e.g. sailing, paddleboarding	1.26%	0.38%
Sector: Educ., health, etc	Children's playground	0.52%	-0.05%
Role: some high-level role	Shop selling sustainable products	-0.46%	0.65%
Role: some high-level role	Education/training/research facility	-0.25%	0.35%
Role: some high-level role	Space provided for sustainable agriculture	0.16%	0.73%
Additions: as many as possible	Beach area	2.10%	0.61%
Additions: as many as possible	Sensory garden for those with learning difficulties	1.68%	0.71%
Additions: cost effective only	Beach area	0.46%	1.92%

Note: Green (red) cells indicate that customers in the relevant segment had a statistically higher (lower) WTP for a given project addition (at a 5-mile distance from the organisation's premises) than customers in the corresponding complement segment 'Other'.

- Participants working in education, health, and social work, had a higher WTP for 'Outdoor BBQ/picnic facilities', 'Water sports facilities, e.g. sailing, paddleboarding', 'Children's playground'. These might be attractive features in the context of school trips, for example.

- Those holding high-level roles in their organisation expressed a lower WTP for most project additions compared to participants in lower-level roles but the differences in WTP were statistically significant for three project additions only.

- Those who would like to see as many project additions as possible being delivered had a substantially higher WTP for 'Beach area' and 'Sensory garden for those with learning difficulties'. The choices made by these participants appear to explain the surprisingly high valuations for these project additions in the overall sample.

In summary, we found a high degree of consistency between the valuations inferred from the participants' choices and their views about relevant aspects of the local environment. Differences in valuations across customer segments tend to be consistent with *a priori* expectations, where held, or at least make intuitive sense. These findings suggest that the pairwise choice exercise worked well and produced valid estimates of WTP.

Valuations by Type of Site

The following figures show household customers' WTP estimates for project additions by type of site—reservoir, canal, water treatment works (WTW), pipeline—at sites 5 miles from home, calculated as a population-weighted average across companies. For reservoirs, valuations are shown for the full set of project additions explored in the survey, while for canals, WTWs, and pipelines, WTP values are shown for a subset of all project additions, reflecting restrictions in the experimental design, as set out in Section 0.

- The valuations of project additions are relatively similar between Reservoir and Canal sites.

- WTP values for project additions at WTWs are substantially higher than for Reservoirs and Canals.

- Project additions along Pipelines are valued less than project additions for Reservoirs and Canals.

Differences in WTP across sites are summarised in Table 14.

Table 14: Total valuation of a common set of project additions, by type of site

Site	Total valuation
Water treatment works	£40.66
Canal	£28.23
Reservoir	£24.55
Pipeline	£18.22

Note: The total annual valuation refers to the set of project additions shown in Figure 24 to Figure 26, i.e., those that are potentially available for all types of site.

While the qualitative findings suggest that support for delivering project additions is strongest for Reservoirs, followed by Canals, Water treatment works and Pipelines, the overall valuation is highest for Water treatment works. Four project additions account for around 75% (over 95%) of the difference in total valuations between Water treatment works and Reservoirs (Canals):

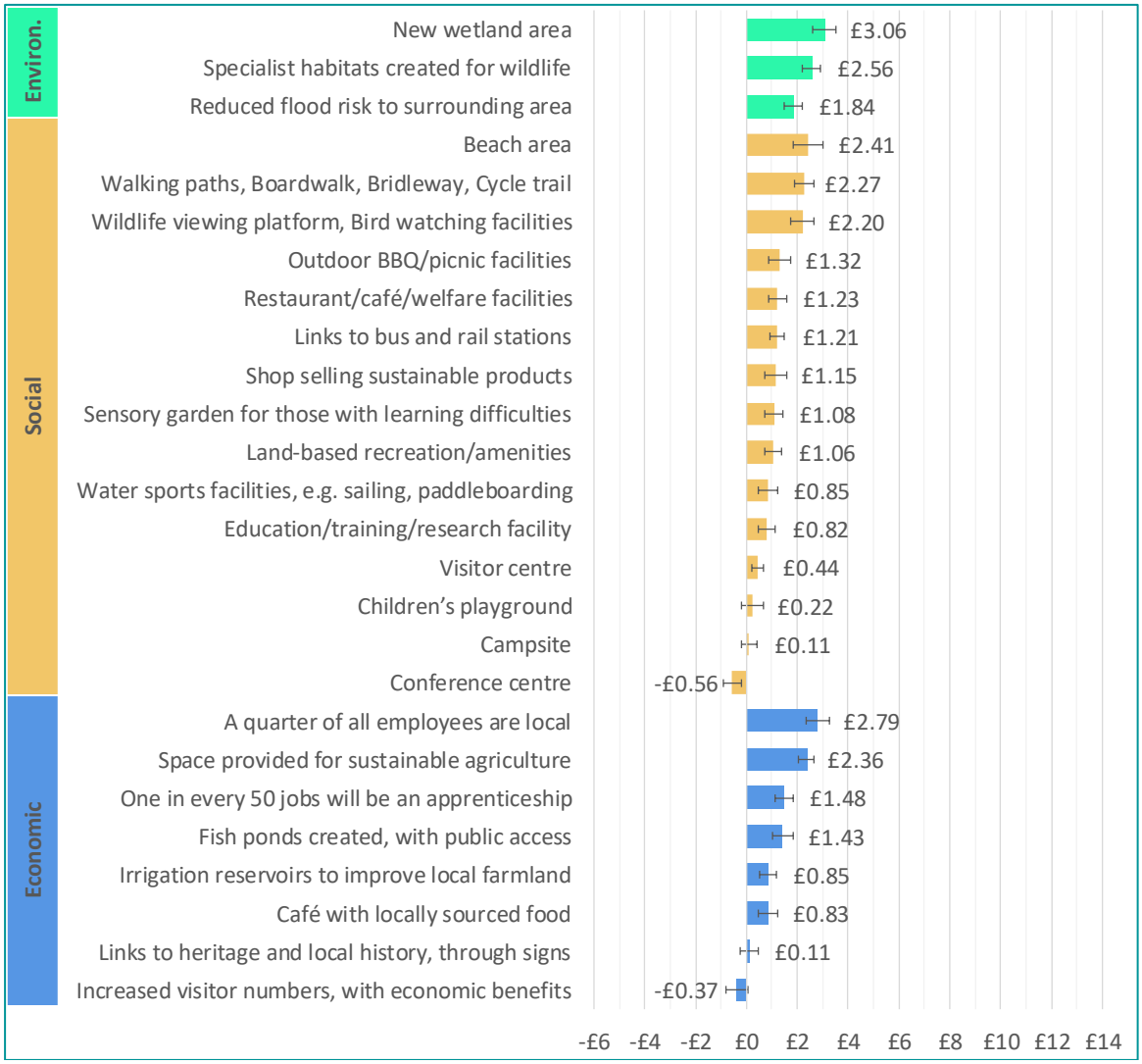
- Specialist habitats created for wildlife
- Conference centre
- New wetland area
- Wildlife viewing platform, Bird watching facilities

The higher WTPs for the above project additions in the context of Water treatment works compared to Reservoirs and Canals could be indicative of a greater need, in the eyes of the customers, to offset the disruption/negative impacts caused by the construction and operation of a Water treatment works compared to a Reservoir, Canal, or Pipeline. For example, one (future) customer stated that

I feel a lot of those environmental ones go in the top corner – there's a lot of construction with projects so there will be a negative impact. You should offset and add back – not just plant some trees

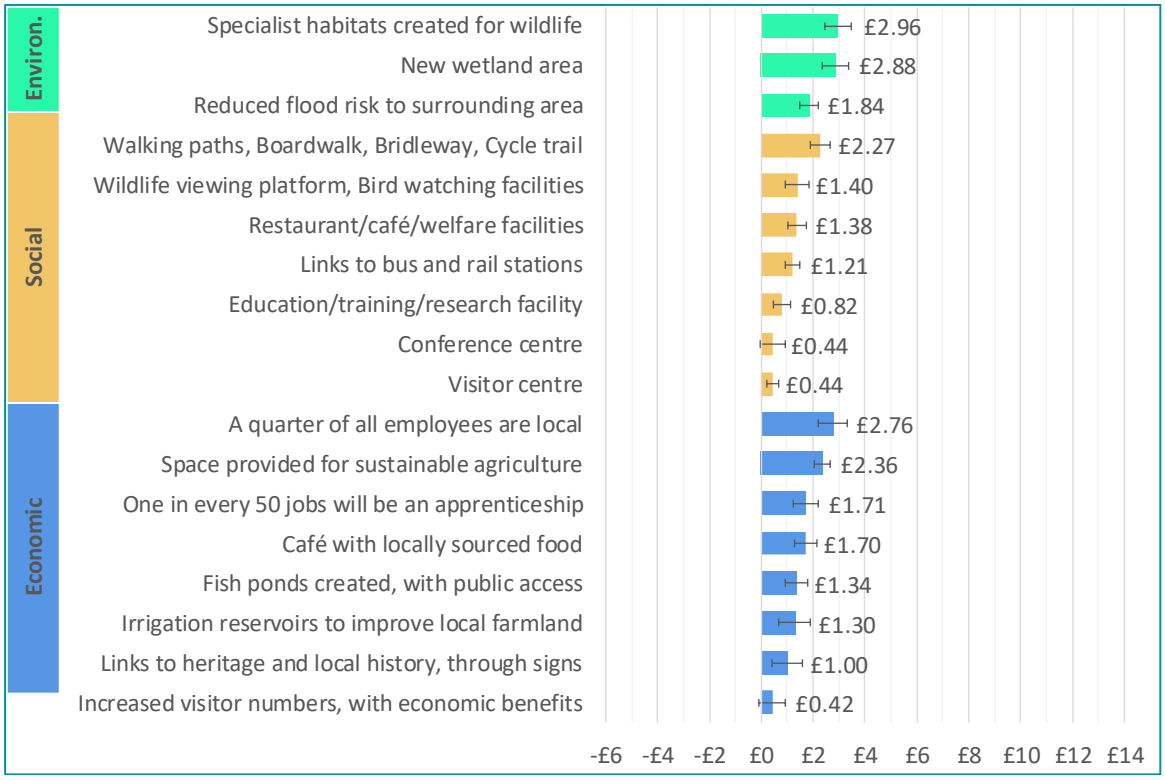
Relatedly, it is possible that the weaker support for project additions at Water treatment works compared to Reservoirs and Canals found in the qualitative work may to some extent be confounded by a lower support for Water treatment works compared to Reservoirs/Canals.

Figure 23: Average household valuations of project additions nearby: reservoir



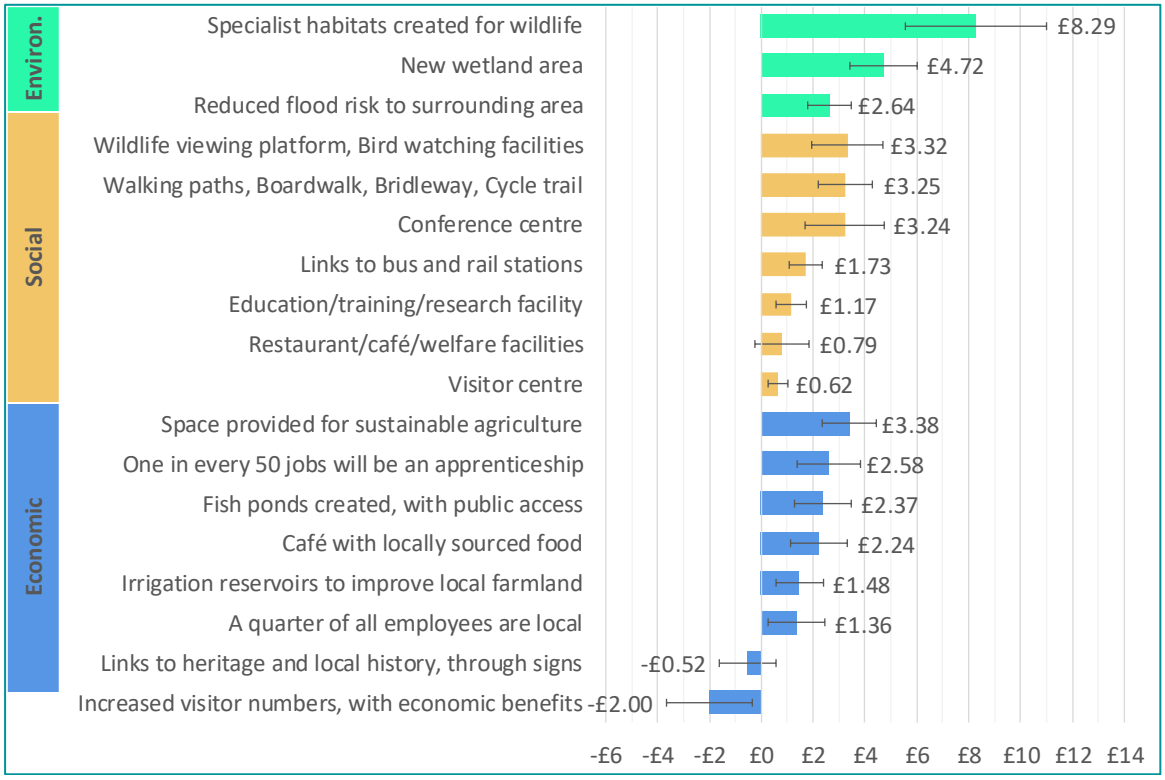
Base: 5,902 participants. Annual WTP in terms of a higher water bill for project additions at a reservoirs 5 miles from home. Population-weighted average across companies. The error bars show 95% confidence intervals calculated using the delta method.

Figure 24: Average household valuations of project additions nearby: canal



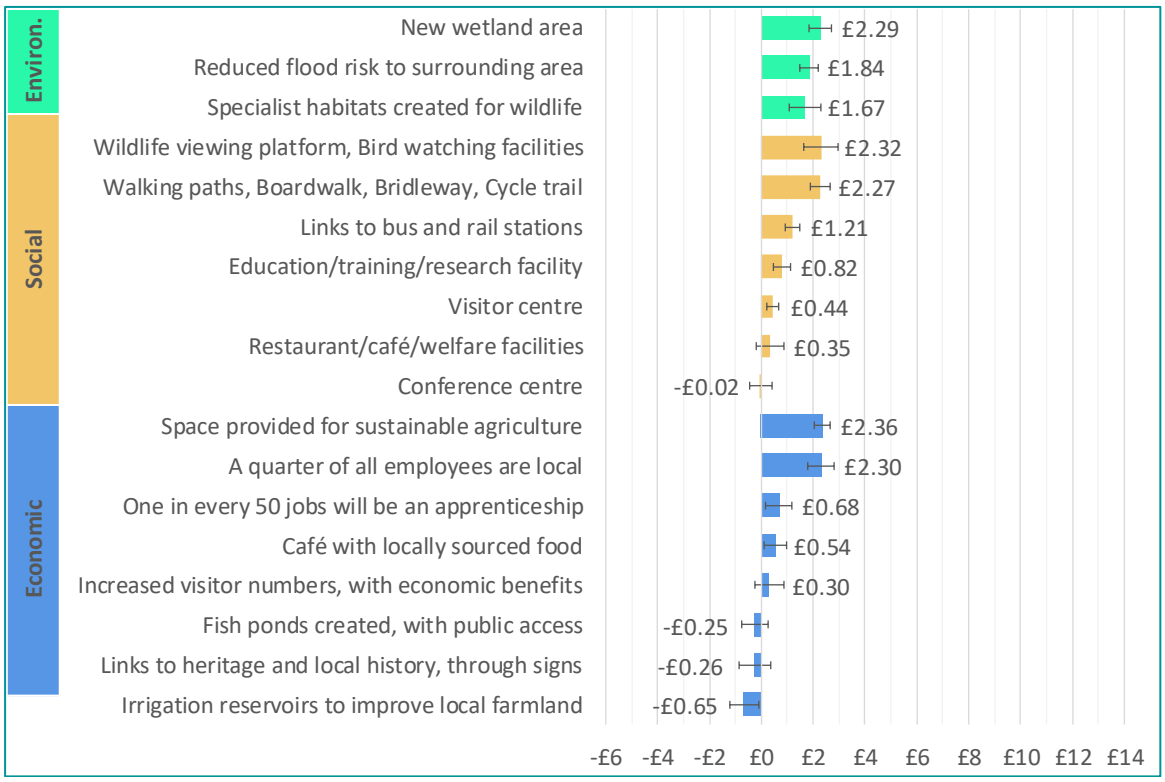
Base: 5,902 participants. Annual WTP in terms of a higher water bill for project additions at a canal 5 miles from home. Population-weighted average across companies. The error bars show 95% confidence intervals calculated using the delta method.

Figure 25: Average household valuations of project additions nearby: water treatment works



Base: 5,902 participants. Annual WTP in terms of a higher water bill for project additions at a water treatment works 5 miles from home. Population-weighted average across companies. The error bars show 95% confidence intervals calculated using the delta method.

Figure 26: Average household valuations of project additions nearby: pipeline



Base: 5,902 participants. Annual WTP in terms of a higher water bill for project additions at a pipeline 5 miles from home. Population-weighted average across companies. The error bars show 95% confidence intervals calculated using the delta method.

Figure 27 to Figure 30 show non-household valuations of project additions by type of site at sites 5 miles away from the organisation's premises[10]. For reservoirs, valuations are shown for the full set of project additions explored in the survey, while for canals, WTWs, and pipelines, WTP values are shown for a subset of all project additions, reflecting restrictions in the experimental design, as set out in Section 0. Table 16 shows the total valuation of the subset of project additions available at all sites, by type of site. As for households, we find that project additions at Water treatment works are valued most highly, while project additions at Canals, which are second-most valued by households, are least valued by non-households.

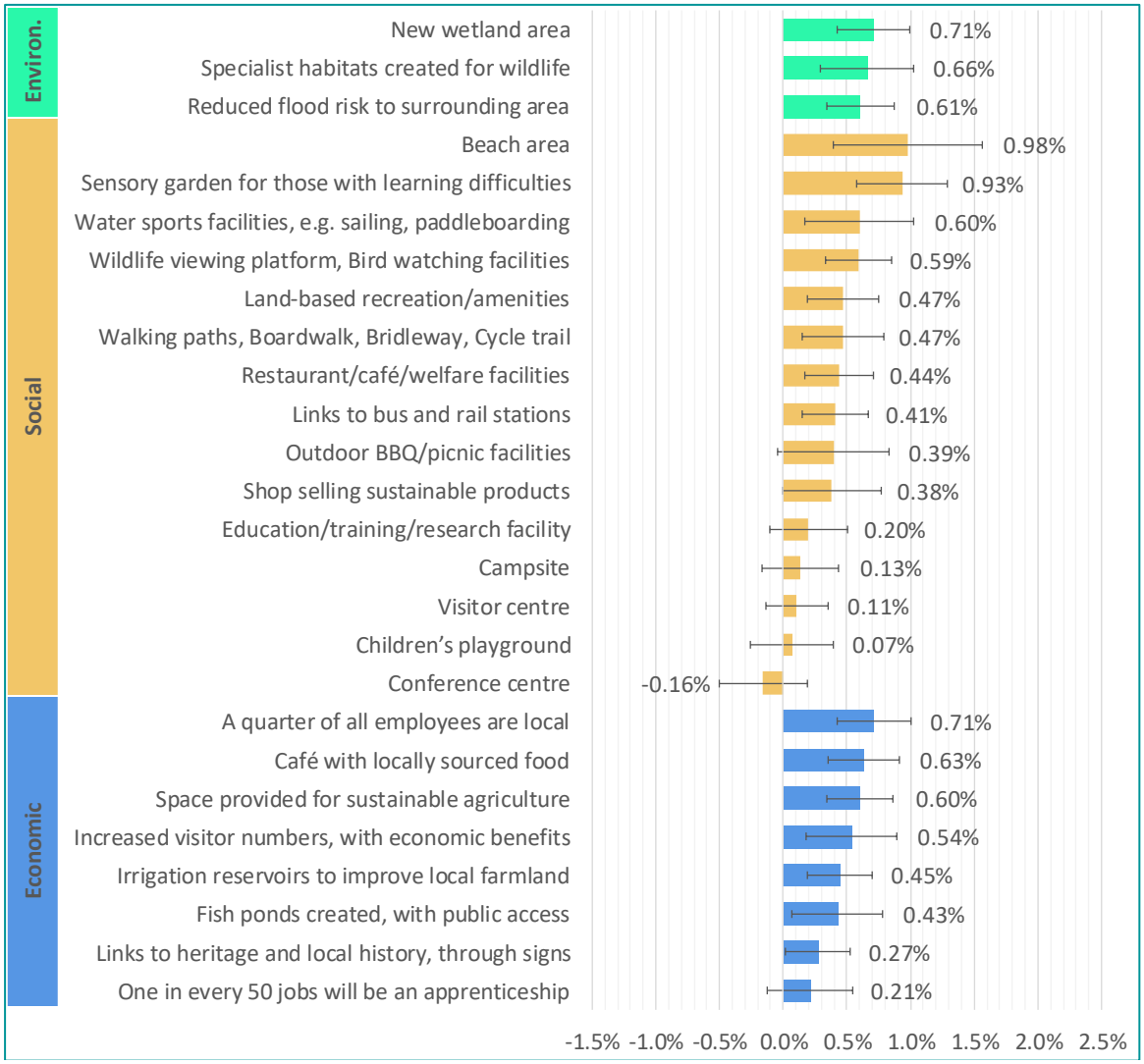
Table 15: Total valuation of a common set of project additions, by type of site

Site	Total valuation
Water treatment works	%9.32
Pipeline	%8.60
Reservoir	%7.89
Canal	%5.67

Note: The total annual valuation, as a percentage of the water only bill, refers to the set of project additions shown in Figure 28 to Figure 30, i.e., those that are potentially available for all types of site.

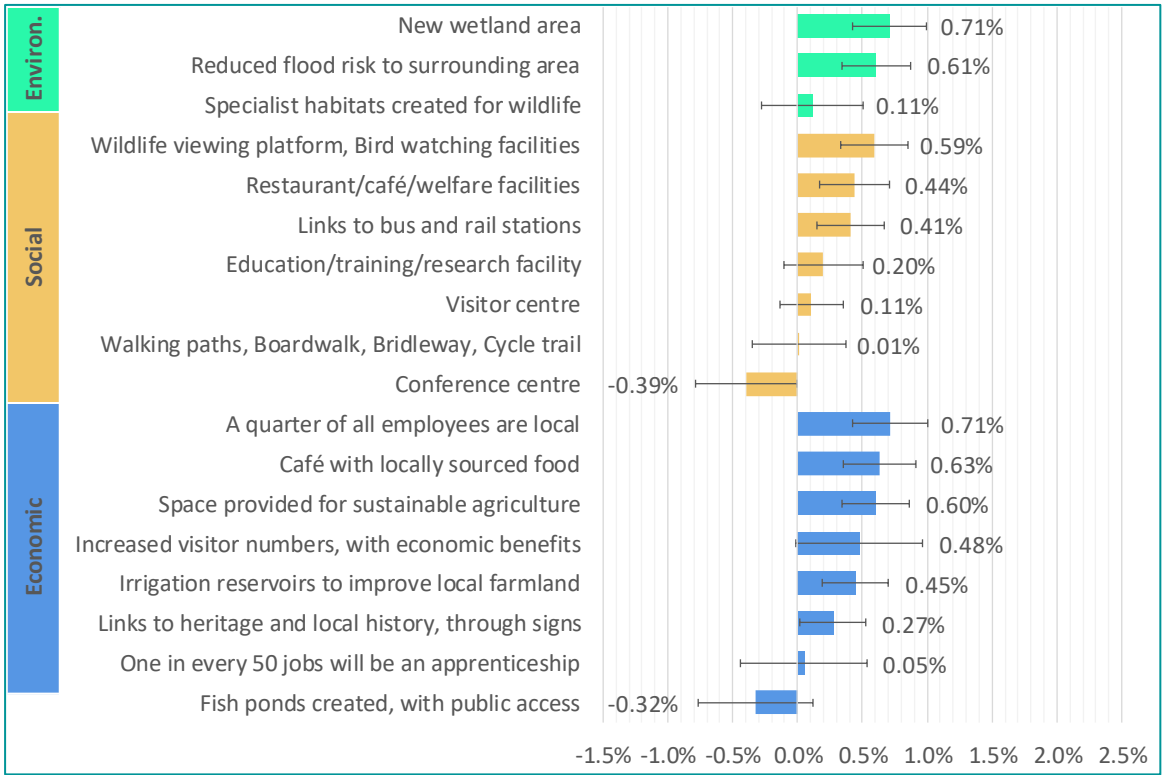
[10] Unlike for households, the WTP values are not averaged across companies, because the non-household model does not include any company interaction terms.

Figure 27: Average non-household valuations of project additions nearby: reservoir



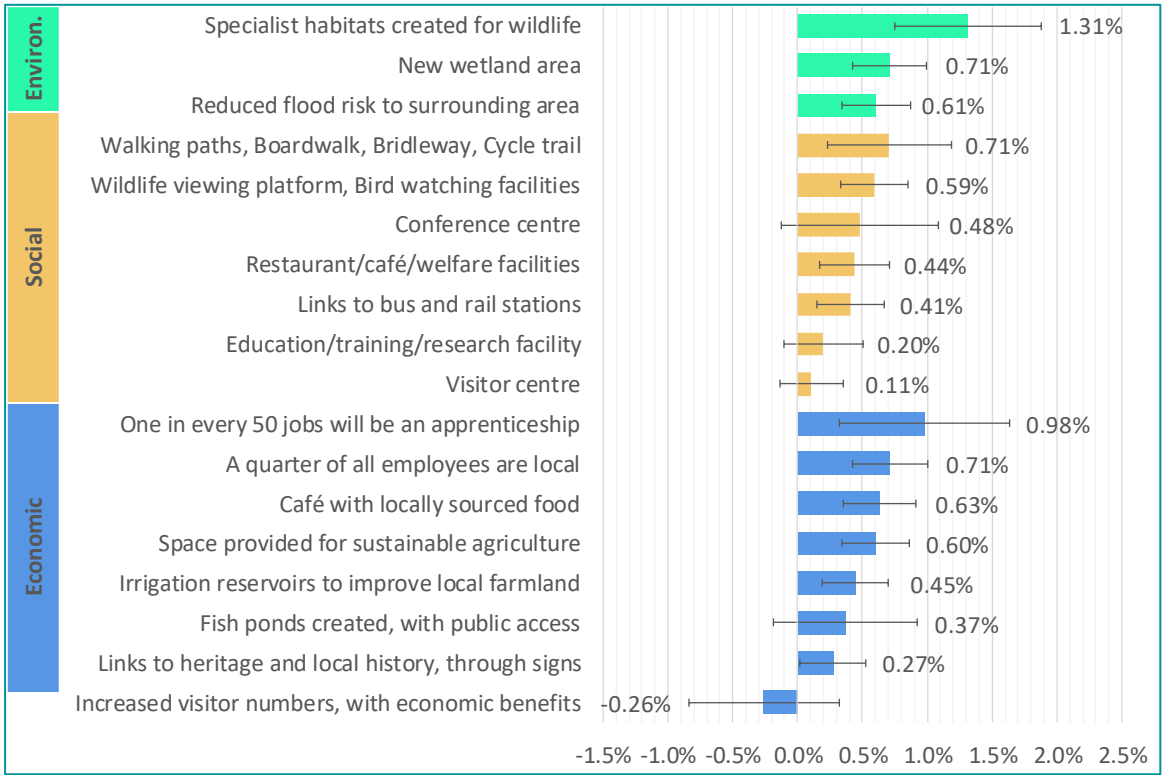
Base: 553 participants. Average annual WTP for project additions at sites 5 miles from the organisation's premises expressed as a percentage of the annual water only bill. The error bars show 95% confidence intervals calculated using the delta method.

Figure 28: Average non-household valuations of project additions nearby: canal



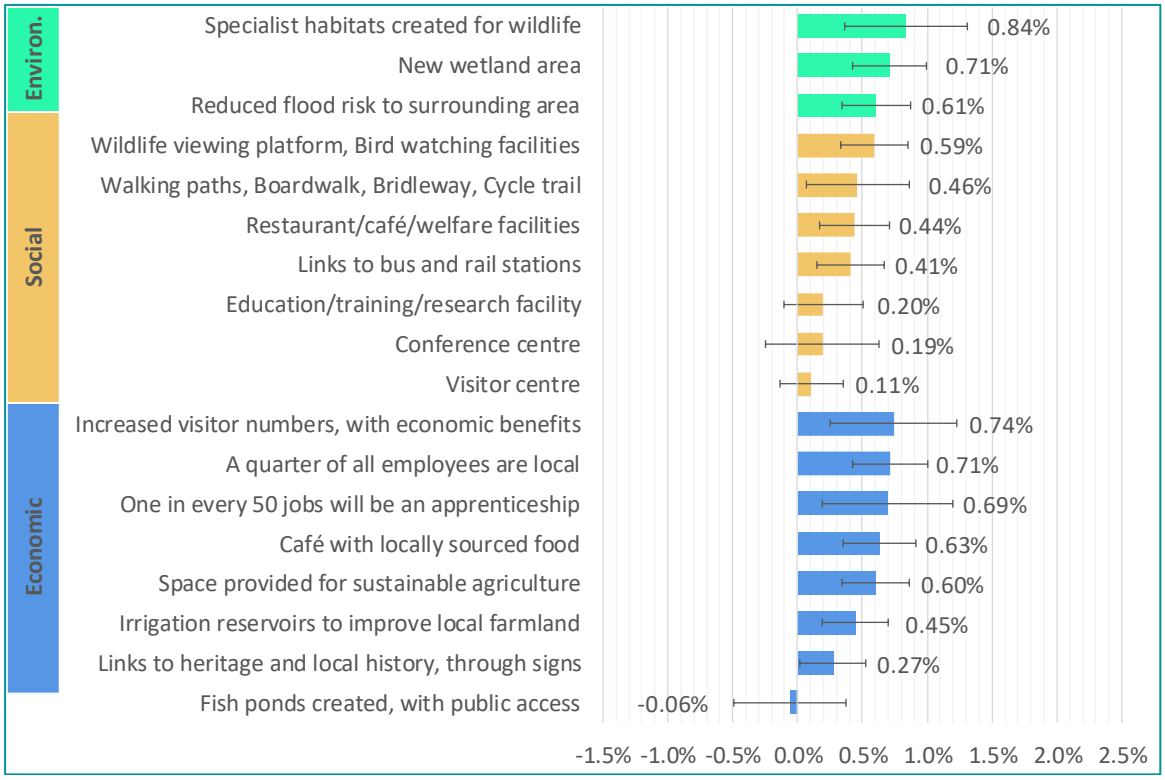
Base: 553 participants. Average annual WTP for project additions at sites 5 miles from the organisation's premises expressed as a percentage of the annual water only bill. The error bars show 95% confidence intervals calculated using the delta method.

Figure 29: Average non-household valuations of project additions nearby: water treatment works



Base: 553 participants. Average annual WTP for project additions at sites 5 miles from the organisation's premises expressed as a percentage of the annual water only bill. The error bars show 95% confidence intervals calculated using the delta method.

Figure 30: Average non-household valuations of project additions nearby: pipeline



Base: 553 participants. Average annual WTP for project additions at sites 5 miles from the organisation's premises expressed as a percentage of the annual water only bill. The error bars show 95% confidence intervals calculated using the delta method.

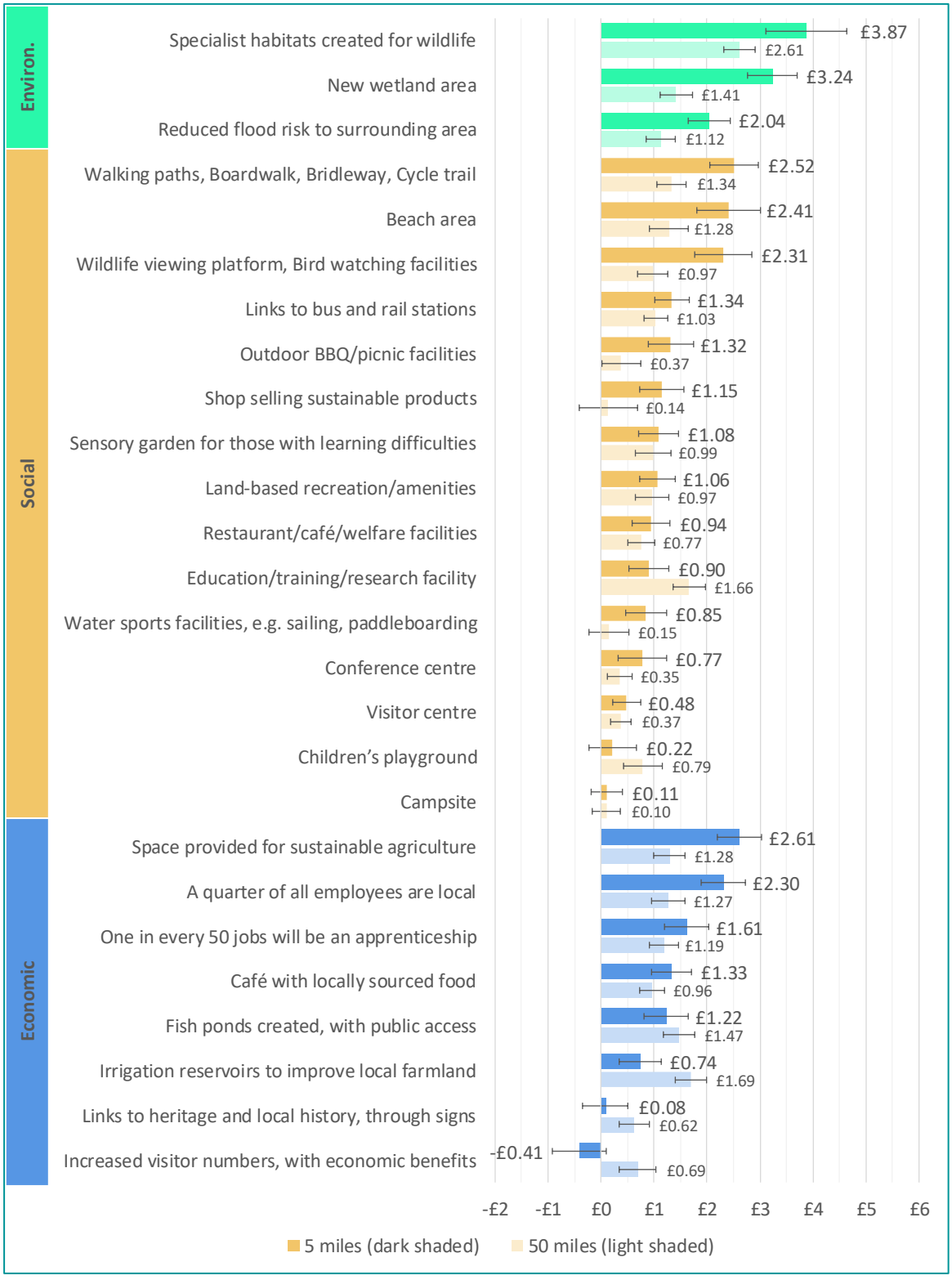
Valuations by Distance

The figure below offers a comparison between household customers' WTP for project additions at sites 5 miles versus at 50 miles from home, calculated as a population-weighted average across companies and types of sites. In most cases, WTP is higher for project additions nearby, as expected. The value estimate of a 'package' including all project additions falls from £36.1 for projects 5 miles from home to £25.6 for projects 50 miles from home. In those cases in which WTP at 5 miles is lower than at 50 miles, the difference is statistically significant at the 5% level, except for 'Fish ponds created, with public access'.

A lower WTP for projects nearby may be due to concerns about long term traffic/congestion caused by the project in the case of 'Education/training/research facility' and 'Increased visitor numbers, with economic benefits', while 'Links to heritage and local history, through signs' may be more valuable outside one's own local area.

The lower WTP for 'Children's playground' nearby compared to far away remains counterintuitive.

Figure 31: Average household valuations of project additions by distance

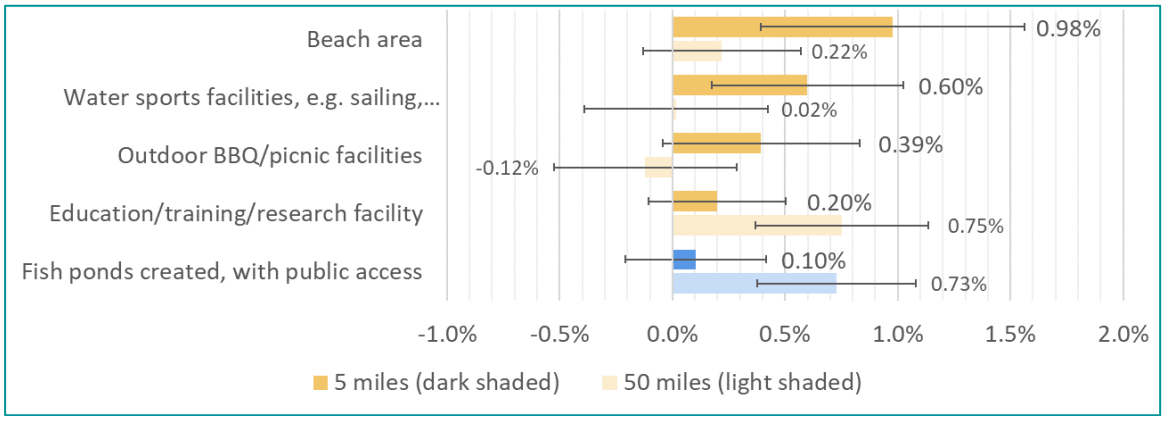


Base: 5,902 participants. Annual WTP in terms of a higher water bill for project additions at sites 5 miles from home. Population-weighted average across companies and sites. The error bars show 95% confidence intervals calculated using the delta method.

Figure 32 compares non-household customers' WTP for project additions at sites 5 miles and 50 miles from the organisation's premises, averaged across types of sites. For most project additions, our econometric model yields WTP estimates that are not dependent on distance. Where there are differences in WTP by distance of the site, the sign of the difference is as expected for three project additions, WTP for project additions nearby being higher.

We find a higher WTP for 'Education/training/research facility' and 'Fish ponds created, with public access' at sites located 50 miles away from the organisations premises. The former could be explained based on concerns around traffic/congestion caused by the facility, while in the case of fish ponds the sign of the difference in WTP remains somewhat counterintuitive.

Figure 32: Average non-household valuations of project additions by distance



Base: 553 participants. Average annual WTP, across types of sites, for project additions as a percentage of the annual water only bill. Only project additions shown for which the WTP estimate differs between sites at 5 and 50 miles from the organisation's premises. The error bars show 95% confidence intervals calculated using the delta method.

3.4 Package Contingent Valuations

In the package contingent valuation question participants were asked if they would prefer to have all the project additions, where deemed to be worthwhile for each site, at a given bill increase, varied across the sample; or, whether they would prefer no project additions and no bill increase. The bill increases were halved or doubled in a follow-up question depending on the answer to the first question.

Figure 33 and Figure 34 show the proportions choosing 'All project additions' for households and non-households, respectively[11]. Both figures show the required downward slope indicating that participants were more likely to choose the option with all project additions when it was cheaper than when it is more expensive.

[11] The proportion estimates were obtained from the *icenReg* package for the R environment (R Core Team 2021). See Anderson-Bergman (2017). icenReg: Regression Models for Interval Censored Data in R. *Journal of Statistical Software*, 81(12), 1-23. The main advantage of the non-parametric approach over parametric estimates is that NPML estimation avoids a-priori specification of a functional form for the 'demand' function.

Figure 33: Household willingness to pay for all project additions

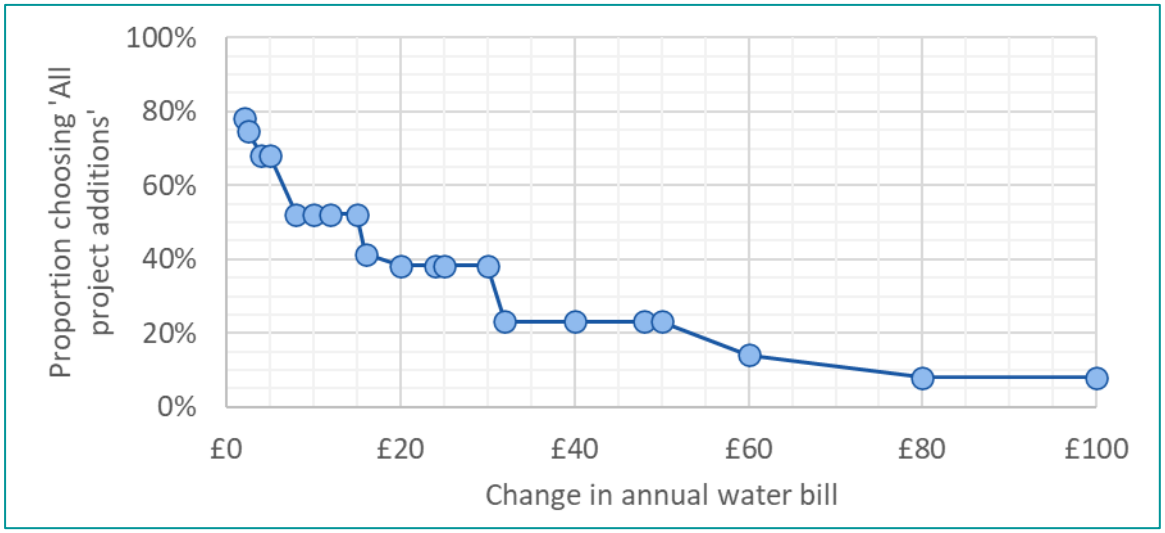
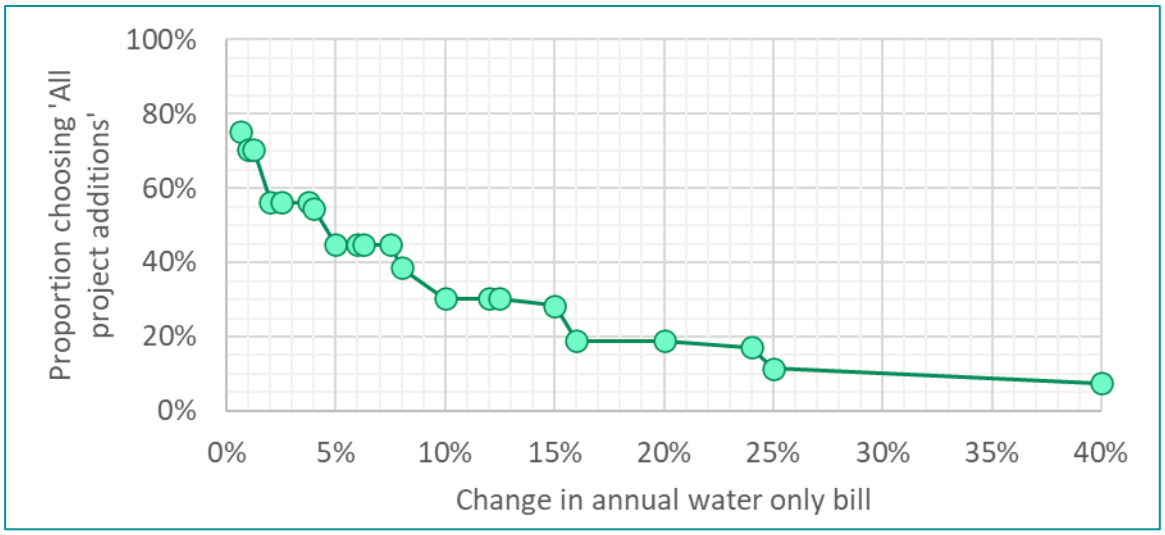


Figure 34: Non-household willingness to pay for all project additions



Based on the curve in Figure 33, we estimate that just over 50% of household customers are willing to pay at least £15 for a package of project additions, while close to 70% are willing to pay at least £5 for the package.

Table 16 presents estimates of mean and median valuations of the 'full package' of project additions. To estimate the implied mean valuation, we used the Turnbull-Kaplan-Meier approach, which calculates the lower-bound of the mean valuation and represents a conservative estimate of the true mean. It is a conservative estimate as it assumes that the WTP of those who say 'Yes' to a £5 bill increase, but 'No' to an £8 bill increase (for example) is £5 and no more. This approach effectively treats the piecewise linear curves shown in Figure 33 and Figure 34 as 'step functions'.

Table 16: Willingness to pay for all project additions

	Household	Non-household
Mean	£23.9 annually	9.16% of the annual water only bill
Mean conf. interval	(£22.5, £24.8)	(7.60%, 11.48%)
Median	£15.2	4.46% of the annual water only bill

Note: The mean is a lower bound Turnbull-Kaplan-Meier estimate, as explained in the text. 95% bootstrap confidence intervals based on 5,000 replications. The median was estimated by interpolating between the relevant probability estimates.

Households' mean valuation of a 'full package' of project additions was around £24, while non-households' mean valuation was around 9% of the annual water only bill. These values are lower than the sum of values from the pairwise choice exercise: £36 (5 miles distance) and around £26 (50 miles distance) for households and between 11% and 12% of the annual water only bill for non-households, depending on the distance of the site. This suggests capping may be needed for individual project additions to ensure that total WTP is not exceeded.

The SP2 choice data were also analysed using interval regression models, which are shown in Table 17 and Table 18 for households and non-households, respectively. The package WTP estimates are given by the coefficient on each company variable. These estimates are broadly consistent with the Turnbull-Kaplan-Meier estimates, based on non-parametric estimation, shown in Table 16. Household annual mean WTP is between £22.5 and £25.4 (depending on company). Affinity Water customers had a statistically lower WTP than customers of the other companies (except Cambridge Water). For non-households, the mean valuations lie between 6.0% (Cambridge) and 8.4% (Severn Trent) of the annual water only bill, but the differences are not statistically significant.

Table 17: Interval regression model of contingent valuation choices: households

	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
Affinity	22.51	0.82	27.56	0.00	20.91	24.12
Anglian	25.83	0.90	28.64	0.00	24.06	27.59
Cambridge	25.17	1.77	14.21	0.00	21.70	28.65
Severn Trent	25.72	0.87	29.54	0.00	24.01	27.42
Southern	24.98	0.97	25.84	0.00	23.09	26.88
Thames	25.37	0.93	27.34	0.00	23.55	27.19
ln σ	3.24	0.02	159.43	0.00	3.20	3.28
σ	25.45	0.52			24.46	26.49
No. observations	5,902					

Table 18: Interval regression model of contingent valuation choices: non-households

	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
Affinity	0.0740	0.0078	9.51	0.00	0.0587	0.0892
Anglian	0.0839	0.0101	8.29	0.00	0.0641	0.1037
Cambridge	0.0598	0.0102	5.85	0.00	0.0398	0.0798
Severn Trent	0.0845	0.0098	8.59	0.00	0.0652	0.1038
Southern	0.0706	0.0071	9.90	0.00	0.0566	0.0846
Thames	0.0779	0.0097	8.03	0.00	0.0589	0.0969
ln σ	-2.5237	0.0704	-35.83	0.00	-2.6617	-2.3857
σ	0.0802	0.0056			0.0698	0.0920
No. observations	553					

3.5 Aggregate Valuations

It is possible to aggregate the valuations of individual project additions by type of site, company, and distance, to the respective population. This section describes this aggregation for three SROs:

- The Fens Reservoir
- South Lincolnshire Reservoir
- Grand Union Canal.

These SROs were able to provide details of the location of the schemes in a form that could be used within a GIS analysis to match to local population densities.

As described in Appendix E, the model provides valuations for individuals living at 5 and 50 miles from the SRO. We then calculated valuations for individuals living at distances between 5 and 50 miles (in 5km intervals), by interpolating the values for 5 and 50 miles.

We were provided the location of the Grand Union Canal and the approximate location of the Fens Reservoir and the South Lincolnshire Reservoir (i.e. the central points of a 10km circle where these SROs might be located). We then estimated, using GIS, the population served by each water company at several distances from the SRO. The population data was extracted from the 2011 Population Census at the level of the census output area. This was corrected using recently released data from the 2021 Population Census at the local authority level.

For each of the three SROs, we then combined the valuations by type of site (reservoir or canal), attribute, company, and distance, with the population served by that company and living at that distance from the SRO. Appendix D shows the results.

This analysis shows how the results are intended to be used within SRO Gate 2 submissions.

4 Summary & Conclusions

PJM economics and Accent were commissioned by a club of water companies to conduct a programme of research to obtain primary evidence on customer preferences to inform the development of 11 strategic resource options (SRO).

The quantitative stage of research has focused on estimating customer willingness-to-pay (WTP) valuations of 26 project additions at SRO sites via a stated preference survey. The key findings presented in the report are based on an analysis of the responses given by a sample of 5,902 household participants and 553 non-household participants.

The findings support the following conclusions:

- Household customers valued the following project additions most highly: 'Specialist habitats created for wildlife' (£3.87 annually); 'New wetland area' (£3.24 annually); 'Space provided for sustainable agriculture' (£2.61 annually)

- Households' average valuation of any project addition was considerably higher in the environmental area (£3.05), compared to the economic area (£1.19) and the social area (£1.16). The combined annual valuation of all project additions was around £36

- Non-Household customers valued the following project additions most highly: 'Beach area' (0.98% of the water only bill, annually); 'Sensory garden for those with learning difficulties' (0.93% of the water only bill, annually); 'Specialist habitats created for wildlife' (0.73% of the water only bill, annually). The combined annual valuation of all project additions was 11.83% of the water only bill

- The estimates of non-household WTP values were substantially less precise than for households. Moreover, many project additions appear to be specifically targeted at and relevant to households only, and, therefore, the stated preferences are likely to be a combination of household and non-household preferences, as well as reflecting the preferences of organisations that are very heterogeneous in terms of sector of activity. This calls for caution in interpreting any findings for non-households

- There is considerable variation in WTP for project additions across types of sites, project additions being most highly valued at Water treatment works, in general, and by distance of the site

- The WTP for a 'package' of project additions was lower than the sum over individual project additions, indicating that capping may be needed for individual project additions to ensure that total WTP is not exceeded.

There are several indications that the stated preference exercises worked well and produced valid findings:

- Participant feedback was positive
- The econometric models were well estimated
- The rank correlation between the valuations of a subset of project additions and the stated importance of some closely linked aspects of the local environment was very high, for both households and non-households
- The valuations of project additions varied in a plausible fashion across customer segments defined based on demographics, views about project additions, outdoor recreation activities, and various household characteristics
- There is a high degree of consistency between the valuations of individual project additions, as estimated in the quantitative stage, and a classification of project additions in terms of relevance and importance based on qualitative research.

Appendix A

Literature Review

Contents

Executive Summary

Introduction

Public value (also known as social value, societal value, or added value) is the set of benefits that a (public or private) organisation or project creates for society. Attention to public value has been growing in the water sector and elsewhere. Considerations of public value are crucial in the case of Strategic Resource Options, which should benefit customers, the wider society, and the environment. This document is a review of the literature on public value, with a focus on the water sector, and infrastructure more generally. The document helps to lay the groundwork for a broader research project to understand public preferences regarding public value.

Guidance

The first part of the review focuses on guidance and recommendations on public value from governmental organisations, companies, and other stakeholders, in the water sector and beyond.

There is a large set of guidance documents on public value in the water sector, including regarding the development of best-value water resources management plans, and other general guidance issued by the regulator and other stakeholders. Other sectors (e.g. energy, construction, rail travel) have also developed frameworks for public value measurement. There is also increased interest in public value at the national level, as shown in the Social Value Act and in frameworks developed to apply the principles set in that legislation. Nevertheless, currently, public value is not fully and universally embedded in the water companies' culture and public value reporting is uneven. In other sectors, public value thinking is still limited mostly to the procurement and construction stages.

Ofwat's public value guidance includes the key principles that:

- Opportunities for public value should be explored; and
- Customer willingness to pay needs to be demonstrated.

The RAPID guidance on Strategic Resource Options in the water sector is brief, but is clear that there needs to be a consistency between Gate Two submissions and water resources management plans in terms of best value and solution benefits.

Most guidance documents list the high-level types of public value that companies should deliver, usually split into three groups: economic, social, and environmental.

Engagement with customers, citizens, and stakeholders is emphasized in many documents. In addition, the public value sought by companies should reflect what society wants (and is prepared to give up something in return for it). However, delivering public value cannot compensate for shortcomings in the delivery of the core services provided by the water companies.

Guidance documents emphasize the need for robust evidence on the effects of all options and recommend monetizing (expected) public value where possible. The development of multi-criteria decision analysis is recommended. Companies should also provide a balanced view of the public's priorities. Customer valuations are recommended. Databooks such as those included in the ENCA (Enabling Natural Capital Approach) framework can also be used. The Water Companies' regional plans already include a series of metrics. Other possible metrics can be found in more general guidance (e.g. National TOMs).

Perceptions and preferences

The second part of the review looks at case studies on perceptions and preferences regarding public value in the UK water sector. The review found little evidence on this topic. The existing evidence suggests that customers welcome the idea of a best value plan, with some caveats: the priority should be to the core services provided by water companies. There is some evidence on public concern about environmental issues in relation to water.

Strategic Resource Option schemes: Gate One submissions

The third part reviews the Gate One submissions for the 11 specific Strategic Resource Option schemes listed in the brief, listing the scope for public value.

Strategic Resource Options Gate One submissions consider a variety of economic, social, environmental wider benefits. Most of the high-level types of public value mentioned are consistent with those mentioned in guidance documents. A few elements are not mentioned in guidance, e.g. land reinstatement and access and connectivity. There is little information on detailed initiatives to deliver public value. These detailed initiatives are provided mostly for recreational public value, biodiversity/habitats, and landscape. So far, customer engagement has provided few insights on perceptions and preferences for public value.

A1. Introduction

Public value (also known as social value, societal value, or added value) is the set of benefits that a (public or private) organisation or a project creates for society (Moore 1995). Attention to public value has been growing in the water sector. Guidelines emphasise the need to develop a 'best value' water resources management plan, rather than simply a least cost plan, considering factors alongside economic cost and seeking an outcome that increases the overall benefit to customers, the wider environment, and society. Ofwat's strategy paper '*Time to Act, Together*' included as one of its three goals (Ofwat 2019) "*for water companies to provide greater public value, delivering more for customers, society and the environment*'.

Looking beyond water, the UK government has embedded public value as an objective within public sector procurement as part of the Public Service (Social Value) Act 2012 (UK Parliament 2012). A national framework for value measurement and quantification has been developed to support this via the Social Value Model (GCF 2020a, 2020b) and the National TOMs (NSVT 2019).

Considerations of public value are crucial in the case of Strategic Resource Options (SRO). Funding is available to water companies for the development of these options, subject to a "gated" process. At each of four "gates" during 2020-25, regulators review progress and decide how and if the options should proceed further. RAPID (The Regulator's Alliance for Progressing Infrastructure Development) supports and assesses option development at each gate and provides recommendations to enable Ofwat to make decisions regarding continuation of funding. Guidance emphasizes that Strategic Resource Options should benefit customers, the wider society, and the environment. Water companies are currently preparing Gate Two submissions.

These developments provide the motivation for the present study, which focuses on the preferences customers have regarding public value for the Strategic Water Resource options that are being considered as part of the RAPID process. The study aims to understand:

- What types of public value customers perceive are important and preferences among those types (and if the preferences change depending on the geographical location/type of scheme or other factors)
- How much are customers prepared to pay
- What language should be used to explain public value

This document forms the first part of the study. It is a review of the literature on public value, with a focus on the water sector, and infrastructure more generally. The document helps to lay the groundwork for developing customer research in the other stages of this research.

The rest of the report is structured as follows.

- Chapter 2 reviews guidance and recommendations on public value from governmental organisations, companies, and other stakeholders, with a focus on the water industry, but also looking at general guidance.

- Chapter 3 reviews case studies on perceptions and preferences regarding public value in the UK water sector.
- Chapter 4 reviews the Gate One submissions for the 11 specific Strategic Resource Option schemes listed in the brief, listing the scope for public value
- Chapter 5 synthesises lessons learnt and the implications for the following stages of the research.

A2. Guidance

A2.1 Introduction

This chapter synthesises and compares guidance and recommendations on public value, issued by governmental organisations, water companies, and other stakeholders. It looks at key documents related to public value in the water industry. The review synthesises the main points of these documents, across three themes:

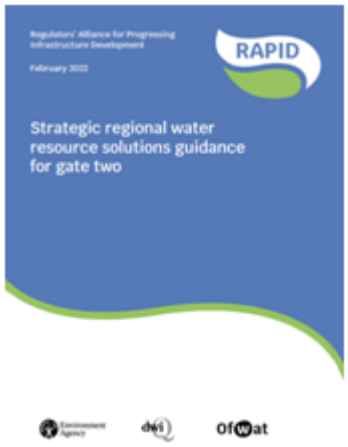
- What is included in public value?
- How should it be delivered?
- How should it be measured?

A2.2 Guidance for Strategic Resource Options Gate Two

RAPID

RAPID has recently issued guidance for the Strategic Resource Options Gate Two submissions (RAPID 2022) (Figure 35).

Figure 35: RAPID guidance for Gate Two (RAPID 2022)



The guidance mentions that Gate Two submissions should include a summary of the best value considerations for each solution:

"*The RAPID process draws on the assessments in the regional and company plans regarding best value, including financial costs and how each solution increases the overall benefit to customers and the wider environment and society*" (RAPID 2022, p.27).

The guidance then points to Ofwat's public value principles (Ofwat 2021, reviewed in Section 2.3 of this document) and the Water Resources Planning Guideline on guidance for compiling a best value plan (EA, NRW, and Ofwat 2021, reviewed in Section 2.4).

It is also mentioned that companies should consider "*a wide range of metrics, risks and values, which should be supported by robust data, analysis and customer and stakeholder support*"

(RAPID 2022, p.27). The submissions should identify the metrics that have been applied to each solution within regional and company-level water resource plans and the metric evaluation outcomes.

In addition, the submissions should report results of customer engagement:

"*The gate two submission should include (…) details of customer preference studies including how they have been reflected in the work undertaken, and conclusions reached.*" (RAPID 2022, p. 28).

All-Company Working Group

The RAPID guidance is supported by a document issued by the All Company Working Group (*Design Principles, Process and Gate Two Interim Guidance*) (ACWG 2021), which details principles, targets, and indicators.

The ACWG principles for Gate Two submissions were derived from the National Infrastructure Commission Design Principles (NIC n.d.):

- Climate ("Mitigate greenhouse gas emissions and adapt to climate change"), People ("Reflect what society wants and share benefits widely")
- Place ("Provide a sense of identity and improve our environment")
- Value ("Achieve multiple benefits and solve problems well").

Public value considerations are explicit, for example, under the **Climate** principle, which mentions that "*projects must be developed to work across companies and/or legislative boundaries to develop sustainable solutions and environmental enhancement for the wider benefit of society*" (ACWG 2021, p.9).

Under the **People** principle, the public value aspect that is emphasised is recreation: is suggested projects should "*maximise opportunities to support active travel and improve recreational access to waterside and green spaces that can improve outcomes for wellbeing, health, local economy, social inclusion and education*" (ACWG 2021, p.10).

Under the **Place** principle, the document mentions several social and environmental aspects (ACWG 2021, p.11):

- "..develop (…) landscape, cultural heritage, health and sustainability"
- "approaches that support and deliver biodiversity net gain"
- "(infrastructure) provide visual delight"

The indicators for these three principles are not metrics to assess the compatibility of the solutions with those principles, but requirements for the submissions themselves, such as evidence of working with stakeholders, and development of specific plans.

The **Value** principle then includes more general considerations on public value:"*Identify opportunities to contribute wider regional benefits outside of the project scope. In particular (…) support the delivery and enjoyment of a healthy water environment"* (ACWG 2021, p.12). It also makes recommendations on how to include public value in the submissions: *"Capture and measure embedded and additional value (…) Quantify these benefits so they can be considered*

meaningfully in conversations on value, financing and risk" (ACWG 2021, p.12). This includes details of the best-value metrics used in Regional Plans and Water Resources Management Plans.

A2.3 Ofwat Guidance

Public value in Ofwat's strategy

Ofwat's strategy paper '*Time to Act, Together*' emphasizes the importance of public value in the water industry, identifying as one of three goals of the industry "*for water companies to provide greater public value, delivering more for customers, society and the environment.*" (Ofwat 2019, p.11). In addition, "*companies will need to be run with a clear purpose, adding wider public value for customers and communities as well as for shareholders*" (p.12).

The main type of public value mentioned in the document is environmental. It is stressed that water companies should consider the environment as an "*integral part of their business, inseparable from the services they provide*" (p.32). Examples mentioned include nature-based solutions rather than hard infrastructure where possible. A social aspect is also mentioned as example: locating training facilities in deprived communities (p.37).

Ofwat's strategy paper also identifies the reason why water companies are in a good position to (and why they should) deliver public value: because of their clear geographical and environmental footprint. It also points out that providing public value benefits the companies themselves, because in the long term, it builds legitimacy in the eyes of the public, helping staff motivation, access to finance, and establishment of partnerships (p.36). However, the paper alerts that delivering public value cannot compensate for shortcomings in the delivery of the core water/wastewater services.

Public value discussion paper and responses

Ofwat's ideas on public value were further developed in a December 2020 discussion paper, following engagement with stakeholders (Ofwat 2020). The document identified four enablers of public value, as recognised by water companies:

- *Governance and leadership* – development of 'social contracts', be open to scrutiny, change committee structure
- *Decision-making tools and frameworks* – "multiple capitals" approaches, include social/environmental value in cost-benefit analysis
- *Customer, community and stakeholder engagement* – draw on views of multiple stakeholders, distinguishing views as customers and citizens
- *Reporting tools and frameworks* - demand from investors for track record of environmental/social performance

Ofwat's view on public value can be synthesized as below. A change in the companies' culture is needed to achieve outcomes (which should be informed by the needs of the public). Public value should be authentic (has to resonate with the community) and delivering it should be a transparent process. It should not shift focus from the companies' core activities and does not necessarily imply increasing costs.

Figure 36: OfWat public value approach

The discussion paper was accompanied by a report commissioned to Purpose Union and Impact Institute, which details companies' practices related to public value and develops a framework to assess public value. (Purpose Union and Impact Institute 2020). According to this document, the approach of water companies to public value, and the way the companies report how they create public value, are uneven. Gaps and problems include:

- Much of reporting is anecdotal, failing to establish a framework that helps to track the companies' culture change
- More attention/rigour to environmental than social themes
- Not enough system-wide thinking in how social/environmental challenges are tackled. Most companies focus on mitigating social and environmental problems, rather than collaborating to address the factors that underpin those problems
- Not enough detail on the social/environmental issues that matter to companies, how those issues relate to each other, and the priority accorded to them
- Not enough communications on public value

Following the stakeholders' responses to the 2020 discussion paper, Ofwat released a document laying out a vision and a supporting set of principles to guide companies in the development of plans that potentially have impacts on public value (Ofwat 2021 - Figure 37). As mentioned before, these principles support the RAPID guidance for Gate Two submissions. Table 19 lists the seven principles.

Figure 37: OfWat public value guidance (Ofwat 2021)

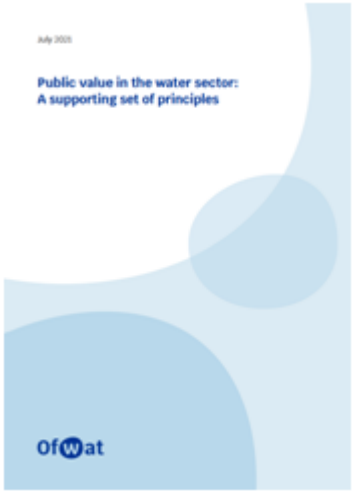


Table 19: Ofwat's Principles for Public Value

		Principle
SCOPE OF PUBLIC VALUE	1	Companies should seek to create further social and environmental value in the course of delivering their core services, beyond the minimum required to meet statutory obligations
DRIVERS FOR DECISION-MAKING AND TRANSPARENCY	2	The mechanisms used to guide activity and drive decision-making should facilitate the delivery of social and environmental benefits that are measurable, lasting and important to customers and communities.
	3	Companies should be open with information and insights on operations and performance.
	4	Delivery of public value outcomes should not come at greater cost to customers without customer support
COLLABORATION AND SYSTEMS THINKING	5	Companies should consider where and how they can collaborate with others to optimise solutions and maximise benefits, seeking to align stakeholder interests where possible, and leveraging a fair share of third-party contributions where needed.
	6	Companies' public value activities should not displace other organisations that are better placed to act.
MATURITY AND FOCUS	7	A company should take account of its capability and circumstances in scoping the delivery of greater public value.

Principles 1, 2, and 4 are relevant for the present study:

- Principle 1 emphasizes that public value should be related to the core services provided by the water companies, focusing on social and environmental value. This is consistent with the strategic priorities and objectives set by the UK and Welsh Governments for Ofwat (DEFRA 2017, Welsh Government 2017)
- Principle 2 suggests companies should define measurable outcomes for options and use tools to understand the costs and benefits of different options (including social and environmental ones). The tools provide a balanced view of competing priorities and allow the prioritisation of options.
- Principle 4 emphasizes the need of robust evidence base for options, especially when these involve greater cost.

The document also reported the main themes from the responses to the discussion paper from water companies. While in many cases, the responses were aligned with Ofwat's views, several concerns were also noted (p.5):

- Different interests groups may prioritise different public value outcomes, which requires companies to make trade-offs. This calls for a full understanding and weighing the views of customers and other stakeholders.
- There is a risk that bills could be used as the vehicle for collecting revenue for investment in creating public value that should otherwise be delivered through taxation or other government actions.

The general view was that the best measures of progress on public value were the level of customer, stakeholder, and community satisfaction (p.7). However, there was also consensus that Ofwat should not use standardised reporting or a pre-determined set of outcomes for public value – this could create a "box-ticking" mind-set (p.8). A more flexible approach is preferred, so that companies can deliver the outcomes that are more relevant to their stakeholders. The principles listed above are an example of this flexible approach.

A2.4 Water Resources Planning Guideline

Guideline

The Water Resources Planning Guideline (EA, NRW, and Ofwat 2021) is a document issued by the Environment Agency, Natural Resources Wales, and Ofwat. It determines that Water Resources Management Plans must be produced by individual water companies every 5 years. The plans should detail how water companies plan to achieve a secure water supply at an affordable cost and protecting and enhancing the environment.

Furthermore, the plans are "best value plans", i.e. they should consider "*factors alongside economic cost and seeks to achieve an outcome that increases the overall benefit to customers, the wider environment and overall society*" (EA, NRW, and Ofwat 2021, Section 9.1). The document lists the factors that should be considered in the best value plan. Table 20 shows the public value aspects included in that list, and classifies them into three groups (economic, social, and environmental). It should be clear in the plan that the wider benefits could not be delivered more efficiently through other means (Section 9.2).

Table 20: Public value benefits listed in the Water Resources Planning Guideline

Economic	Social	Environmental
■ Affordability ■ Distributional impacts ■ Local regeneration ■ Economic growth	■ Public health ■ Well-being ■ Recreation ■ How the benefits above are distributed spatially and over time	■ [unspecified] environmental improvements ■ Natural capital ■ Biodiversity ■ Achieving net zero [carbon emissions] and [addressing] the climate emergency

The guideline encourages companies to use a wide range of metrics, but identifying where there is potential risk of double counting of benefits. In addition, weightings to the metrics should be justified (Section 10.3).

Supplementary guidance then explains how the benefits can be considered in decision-making (in England) (EA 2021). Three types of assessment are considered:

- Strategic environmental assessment (including: biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, and cultural heritage)
- Natural capital assessment (as a minimum, it should include: biodiversity and habitat, climate regulation, natural hazard regulation, water purification, water regulation)
- Biodiversity net gain assessment

This supplementary guidance also recommends companies to look for opportunities to deliver multiple benefits, including improvements to water quality, flood risk reduction, reduction in greenhouse gases, and carbon sequestration. In addition, regional groups should look for benefits across different sectors.

A UK Water Industry Research report (UKWIR 2020) provides more details on how best value should be defined and implemented within the context of water resources planning. The report

recommends multi-criteria decision analysis as an appropriate tool for delivering a best value plan. In addition, it recommends consultation with customers and other stakeholders, to ensure that impact metrics are broad-ranging and appropriately defined and measured. The following outputs should be sought:

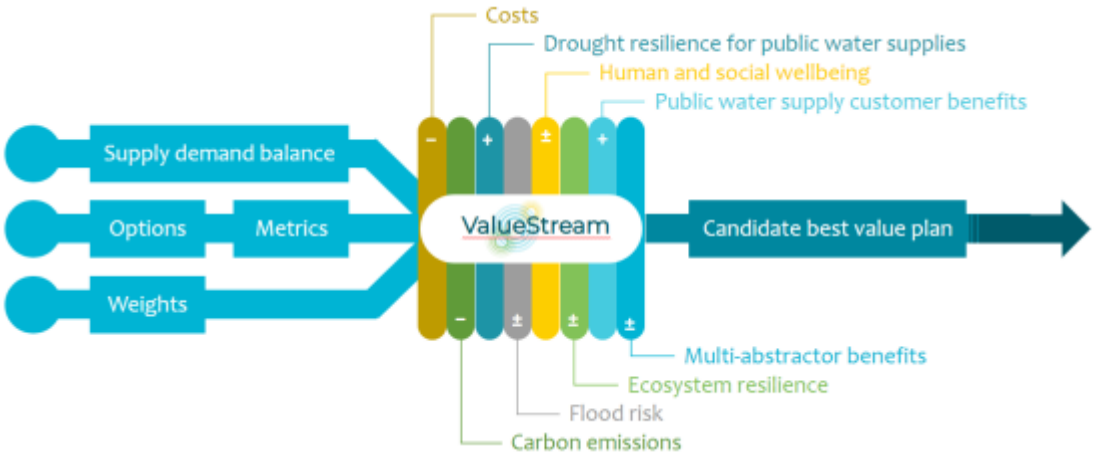
- Qualitative insight to support development of metrics
- Quantitative measures of customer preference across value criteria, e.g. via discrete choice experiments
- Quantitative acceptability testing of the plan

Regional Water Resources Management Plans

Water companies work together in five regional groups to find options to secure long-term water supply and that have wide shared benefits. The regional groups in England produce a water resources plan. According to the (England) National Framework for Water Resources (EA 2020), the plans must "*identify a set of options that provide the best value to customers, society and the environment rather than simply the least cost*". In addition, regional water resources groups should work across companies and sectors to create public value beyond the standards set by the regulator.

The Water Resources West Emerging Regional Plan (released for consultation in January 2022) is consistent with these principles. One of its objectives is to "*deliver positive environmental outcomes, avoid deterioration, increase environmental resilience and promote wellbeing in our communities*" (WRW 2022, p.4). Options that yield the best value are chosen according to a range of metrics of the option's costs and impacts. A multi-criteria analysis tool (ValueStream) has been developed (Figure 38). The tool operates at the option selection and scheduling level, and includes metric weights directly based on customer stated preference research.

Figure 38: Water Resources West Regional Plan: ValueStream tool



Source: WRW (2022, p.52)

Table 21 shows the eight metrics integrated in the tool. The positive effects (benefits) and negative effects (dis-benefits) are captured in separate metrics to avoid the netting off of such effects. The tool will be used to explore trade-offs between options.

Table 21: Water Resources West Regional Plan: metrics

Metric	Definition
Cost	Total net present value
Carbon cost	Total net present value of monetised carbon cost
Public water supply drought resilience	Supply-demand balance charge at 1 in 500 level
Flood risk	Qualitative assessment from Strategic Environment Assessment/Natural Capital Assessment, converted to a linear scale
Human and social wellbeing	Human health, social and economic wellbeing, cultural heritage, and air quality assessments from Strategic Environment Assessment/Natural Capital Assessment, converted to a linear scale
Ecosystem resilience	Biodiversity, habitats, and sustainable natural resource assessments from Strategic Environment Assessment/Natural Capital Assessment
Public water supply customer supply resilience	Customer valuations (willingness to pay) net present value, including supply interruptions and water quality
Multi-abstractor benefits	Water quality and quantity, and water resources from Strategic Environment Assessment/Natural Capital Assessment, converted to a linear scale

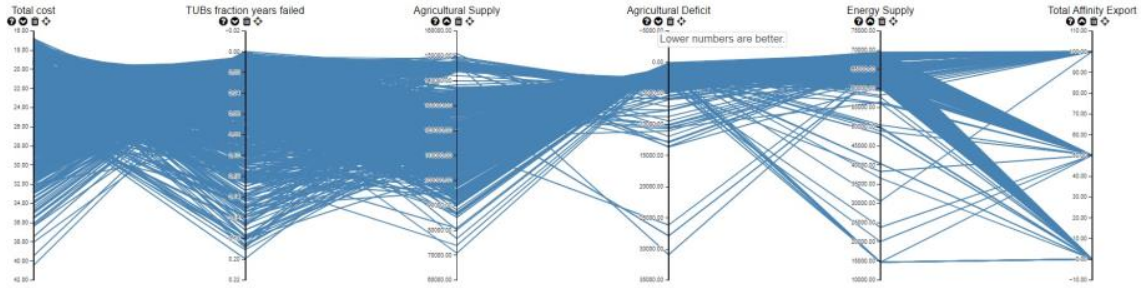
The Emerging Water Resources East Regional Plan (for consultation) (WRE 2022) is also consistent with the best value plan approach. The *PolyVis* tool is a decision-support search tool created for stakeholders to provide input into their preferred solutions. The tool includes Pareto-optimal portfolios of (unscheduled) options, assessed on a number of metrics. Some metrics are used to find optimal solutions. Other metrics are tracked by the tool but not used to find optimal solutions (Table 22). Figure 39 shows an example of a tool output, with the performance of the various options assessed against various metrics.

Table 22: Water Resources East Regional Plan: metrics

Key performance metrics (optimised)
■ Supply and supply deficits for energy and agricultural abstraction licence holders
■ Export capacity to Water Resources South East region
■ Capital and operating cost of supply options
■ Levels of service and reliability of public water supply

Other metrics (tracked but not optimised)
■ Capital and operating carbon footprint of supply options ■ Environmental flow indicators at a catchment level ■ Environmental effects of construction and operation of the strategic supply options – positive and negative scores against strategic environmental assessment objectives ■ Natural environment derived services and benefits (Natural Capital approach) ■ Biodiversity units requiring replacement (through Biodiversity Net Gain)

Figure 39: PolyVis tool



Source: WRE (2022, p.53)

The Water Resources South East Emerging Regional Plan (for consultation) (WRSE 2022a) identifies four main areas in which water companies in the region can contribute to create public value:

- Investment in infrastructure to deliver safe and resilient water supplies, contributing to economic growth, jobs, and skills and "*a range of wider benefits for people, communities and the environment*" (p.36)
- Regeneration of the Grand Union Canal, enhancing biodiversity and creating recreational opportunities (cycling, walking, canoeing, and paddle boarding)
- Using water more efficiently, saving energy (as less water needs to be abstracted, treated, moved, and heated), contributing to affordability of water and energy bills, increasing the security of both water and energy services, and reducing carbon emissions
- Reducing damaging abstraction and promoting nature-based solutions, providing benefits for the environmental and people

The plan will use a visualisation tool that incorporates customer preferences via direct option preference score and metric importance scores. Table 23 is a list of the best value criteria to be used, which are related to the objectives of the plan. Some criteria are constraints within the plan (so the plan must deliver them). This includes meeting the supply-demand balance, reducing leakage by 50% by 2050, achieving levels of abstraction reduction, and increasing resilience to a one in 500-year drought event (WRSE 2022b).

Table 23: Water Resources South East Regional Plan: criteria (WRSE 2022a)

Objective	Criteria

Deliver a secure and wholesome supply of water	■ Meet the supply demand balance ■ Reduce leakage by 50% by 2050 ■ Distribution input per person ■ Customer preference score
Deliver environmental improvement and social benefit	■ Abstraction reduction ■ Environmental disbenefits (Strategic Environment Assessment) ■ Environmental benefits (Strategic Environment Assessment) ■ Enhancement of natural capital value ■ Biodiversity net-gain score ■ Cost of carbon offsetting
Increase the resilience of the region's water systems	■ Resilience to 1 in 500-year drought event (date achieved) ■ Reliability (how well the system can cope with short-term shocks without changing how it performs) ■ Adaptability (how well the system can adapt so it can accommodate short-term shocks) ■ Evolvability (how well the system can be modified to cope with long term trends)
Deliver at a cost that is acceptable to customers	■ Cost ■ Spread of the cost across present and future generations

A2.5 National-level Strategy Documents

The water resources long-term planning framework (Water UK 2016) provides some information on how to value the wider societal effects of droughts (public health and civil unrest). The NetZero 3030 Routemap, a document by Water UK, emphasize environmental aspects and the role of the water industry in achieving net-zero carbon emissions (Water UK 2020). This includes several objectives such as reducing operational emissions, using renewable energy generation and bioresources, and sequestration through interventions such as peatland and grassland restoration and tree planting.

The Water Strategy for Wales (Welsh Government 2015) sets out the Welsh Government's strategy for the management of water resources and achievement of wider benefits. These include direct support for jobs and green growth, tourism and recreational opportunities (and related well-being and good physical and mental health benefits) in both urban and rural areas, use of water features for educational purposes and improving public appreciation of the need

for well-managed water resources. It is also mentioned that community benefits should seek to directly benefit low-income households or people at risk of poverty.

A2.6 Other Water Industry Documents

Ofwat's Future Ideas Lab

Ofwat has set up the Future Ideas Lab, accepting submissions on how the price review system can evolve to meet the challenges faced by the water sector. Some of the submissions suggested ideas related to the creation of public value.

A submission by SIA Partners reviews the state of the art in the water industry around defining, delivering, measuring, and embedding public value, finding an uneven situation (Figure 40). The area with most gaps is measurement. Only three companies reported quantitative metrics of public value delivered from its activities and they do this retrospectively (after delivery), without forecasting or monitoring performance (SIA Partners 2021).

Figure 40: State of the art on public value reporting by water companies

Yorkshire Water's submission addresses the question raised by Ofwat on what could be the role of the price review in encouraging or incentivising companies to better deliver public value. It proposes a notion of public value grounded on the concept of multiple capitals (Figure 41). Customer valuations are needed to estimate the value of some components of social capital. Wider valuations (e.g. from the literature) estimate the value of human capital and other components of social capital. The submission also proposes incentive rates to create wider value, while ensuring a minimum level of service in key areas (Yorkshire Water 2021).

Figure 41: Value estimation and capital

In another submission, United Utilities and The Rivers Trust (2021) proposed nature-based solutions as key to derive wider (environmental) benefits in the sector, giving as examples biodiversity, tee plantation, reduced flood risk, and carbon reduction.

A2.7 Government Guidance on Public Value

Social Value Act

The UK government has embedded public value as an objective within public sector procurement as part of the Public Service (Social Value) Act 2012 (UK Parliament 2012, Cabinet Office 2012)), applicable in England and Wales. This legislation recommends commissioners to think not in terms of "lowest cost" but in terms of "value for money", considering how alternative proposals improve "*the economic, social and environmental well-being of the relevant area*" The Procurement Reform (Scotland) Act has similar recommendations (Scottish Parliament 2014).

In a survey implemented as a part of a review of the Social Value Act (Cabinet Office 2015), the majority of respondents thought that the Act brought wider benefits to their local area, such as local employment (83%), use of local businesses in the supply chain (70%), financial investment (66%), and environmental improvements (66%). However, it also found that measurement of public value was not sufficiently developed (in terms of consistency and rigour). As such, it is difficult for organizations to compare public value provided by two alternatives.

The Social Value Model sets out then government's public value priorities for procurement (GCF 2020a, 2020b), according to five themes and eight related policy outcomes. A number of metrics is also recommended (Table 24).

Table 24: Social Value Model: themes, policy outcomes, and metrics

Themes	Policy outcomes	Metrics
COVID-19 recovery	Help local communities to manage and recover from the impact of COVID-19	■ Number of full-time equivalent employment opportunities created for those who were made redundant due to COVID-19. ■ Number of people-hours spent supporting local community integration, such as volunteering and other community-led initiatives related to COVID-19

		■ Number/% of companies in the supply chain to have implemented the six standards in the Mental Health at Work commitment.
Tackling economic inequality	Create new businesses, new jobs and new skills	■ Number of full-time equivalent employment opportunities created ■ Number of apprenticeship/training opportunities created or retained ■ Number of people-hours of learning interventions delivered
	Increase supply chain resilience and capacity	■ For start-ups, SMEs, VCSEs; and mutuals: number/value of contract opportunities awarded; total spend under the contract, as % of the overall contract spend. ■ Number/% of companies in the supply chain with Cyber Essentials/ Cyber Essentials+ certification/have adopted the National Cyber Security Centre's 10 steps [where relevant]
Fighting climate change	Effective stewardship of the environment	■ Number of people-hours spent protecting and improving the environment under the ■ Number of green spaces created ■ Annual reduction in emissions of greenhouse gases (metric tonnes carbon dioxide equivalent) ■ Annual reduction in water use (litres) ■ Annual reduction in waste to landfill (metric tonnes)
Equal opportunity	Reduce the disability employment gap	■ Number/% of disabled people employed ■ Number/% of disabled people on apprenticeship schemes ■ Number/% of disabled people on other training schemes
	Tackle workforce inequality	■ Number/% of people from groups under-represented in the workforce employed ■ Number/% of people from groups under-represented in the workforce on apprenticeship schemes ■ Number/% of people from groups under-represented in the workforce on other training schemes
Wellbeing	Improve health and wellbeing	■ Number/% of all companies in the supply chain to have implemented measures to improve the physical and mental health and wellbeing of employees. ■ Number/% of all companies in the supply chain to have implemented the six standards in the Mental Health at Work commitment ■ Number/% of all companies in the supply chain to have implemented the mental health enhanced standards,

		for companies with more than 500 employees, in Thriving at Work.
	Improve community cohesion	■ Number of people-hours spent supporting local community integration, such as volunteering and other community-led initiatives

The National TOMs (Themes, Outcomes and Measures) is a framework developed by the Social Value Taskforce for measuring and reporting public value according to the Public Service (Social Value) Act 2012 (NSVT 2019, SVP 2021). It defines standards for measuring public value, referring to a set of 5 themes, 18 related policy outcomes, and 35 measures (each with a financial proxy) (Table 25). The proxies were developed from adaptations of cost benefit analysis and appraisal techniques as outlined in public-sector guidelines. The degree of robustness of the proxies is indicated in the guidance documents.

Table 25: National TOMs (SVP 2021)

Themes	Outcomes	Measures
Jobs: promote local skills and employment	More local people in employment	■ No. of local direct employees hired or retained ■ % of local employees
	More opportunities for disadvantaged people	■ No. of employees who are long term unemployed ■ No. of employees who are Not in Employment, Education, or Training ■ No. of employees who are rehabilitating or ex offenders as a result of a recruitment programme ■ No. of disabled employees ■ No. of hours of support into work provided to. unemployed people through career mentoring
	Improved skills for local people	■ No. of staff hours spent on local school and college visits ■ No. of weeks of training opportunities ■ No. of weeks of apprenticeships
	Improved employability of young people	■ No. of hours of support into work provided to unemployed people through career mentoring ■ No. of weeks spent on meaningful work placements or pre-employment course; student placements ■ Meaningful work placements that pay Minimum or National Living wage according to eligibility (internships)
Growth: supporting growth of responsible regional business	More opportunities for local MSMEs and VCSEs	■ Total amount (£) spent with VCSEs within the supply chain ■ Provision of expert business advice to VCSEs and MSMEs ■ Equipment or resources donated to VCSEs (£ equivalent value) ■ Number of voluntary hours donated to support VCSEs ■ Total amount (£) spent in local supply chain

		■ Total amount (£) spent through contract with local micro, small and medium enterprises
	Improving staff wellbeing and mental health	■ No. of employees that have been provided access for at least 12 months to comprehensive and multidimensional wellbeing programmes ■ Mental Health campaigns for staff on the contract to create community of acceptance, remove stigma around mental health ■ Equality, diversity and inclusion training provided both for staff and supply chain staff
	Reducing inequalities	■ Number and type of initiatives to be put in place to reduce the gender pay gap for staff employed ■ % of staff on contract that is paid at least the relevant Real Living wage ■ % of contractors in the supply chain to pay at least Real Living wage
	Ethical procurement is promoted	■ % of procurement contracts that include commitments to ethical employment practices in the local and global supply chain. ■ Initiatives taken throughout the local and global supply chain to strengthen the identification, monitoring and reduction of risks of modern slavery and unethical work practices
	Social Value embedded in the supply chain	■ % of contracts with the supply chain on which Social Value commitments, measurement and monitoring are required
Social: healthier, safer and more resilient communities	Creating a healthier community	■ Initiatives taken or supported to engage people in health interventions or wellbeing initiatives in the community
	Vulnerable people are helped to live independently	■ Initiatives to be taken to support older, disabled and vulnerable people to build stronger community networks
	More working with the community	■ Donations or in-kind contributions to local community projects ■ No. of hours volunteering time provided to support local community projects
Environment: protecting and improving	Climate impacts are reduced	■ Savings in CO2 emissions achieved through de-carbonisation ■ Existence of a policy and programme to achieve net zero carbon ■ Carbon Certification achieved

our environment	Air pollution is reduced	Corporate travel schemes available to employees
	Safeguarding the natural environment	Donations or investments towards expert designed sustainable reforestation or afforestation initiatives
	Sustainable procurement is promoted	■ % of procurement contracts that include sustainable procurement commitments or other relevant requirements and certifications ■ Supply Chain Carbon Certification achieved ■ Requirements for suppliers to demonstrate climate change and carbon reduction training for all staff
Innovation: promoting social innovation	Social innovation to create local skills and employment	■ Innovative measures to promote local skills and employment
	Social innovation to create local skills and employment	■ Innovative measures to promote and support responsible business
	Social innovation to enable healthier safer and more resilient communities	■ Innovative measures to enable healthier, safer and more resilient communities
	Social innovation to safeguard the environment and respond to the climate emergency	■ Innovative measures to safeguard the environment and respond to the climate emergency

Appraisal guidance

The Green Book is HM Treasury's general framework for appraisal of policies, programmes, and projects (HMT 2022). It includes recommendations on how to assess some aspects of public value (e.g. public goods, positive or negative externalities). The most recent version of the Green Book states, as a principle of appraisal, that "s*ocial or public value […] includes all significant costs and benefits that affect the welfare and wellbeing of the population, not just market effects. For example, environmental, cultural, health, social care, justice and security effects are included*" (p.5). Furthermore, these wider costs and benefits can be monetisable, quantifiable but not monetisable, or qualitative unquantifiable (p.41).

The Green Book suggests using valuation methods such as revealed preference, stated preference, and wellbeing approaches (p.59) where market prices are not available. Specific approaches and values are recommended for some types of benefits (Appendix A1). Of relevance to this review are:

- Recreational value of the natural environment - It is recommended to use the ORVal Tool (http://leep.exeter.ac.uk/orval) to model the visitation rates and recreational welfare benefits provided by creating or altering accessible green space. Additional values are provided by ENCA (Enabling Natural Capital Approach) documentation (see below)
- Local amenity, and physical and mental health benefits of green space - Values are provided by the ENCA documentation
- Nature-based carbon reduction - Values are provided by the ENCA documentation
- Biodiversity - Valuation guidance is still in development. However, the Green Book recommends that, to avoid double counting, biodiversity should only be valued where it directly affects human wellbeing and where it is additional to other benefits (e.g. recreation, amenity).

The ENCA documentation mentioned above is supplementary guidance to the Green Book, detailing how to incorporate natural capital into appraisal, considering the value for people and the economy (DEFRA 2021). Two databooks (ENCA Services and Assets Databooks) collage data sources, tools, and economic valuation studies.

Other documents

The Infrastructure and Projects Authority "*Roadmap to 2030*" paper (IPA 2021) sets out a vision for infrastructure delivery emphasising wider benefits for people and nature. Focus area 1 of this roadmap is delivering infrastructure to drive improved outcomes for people and nature. According to the document, the starting point for interventions in the built environment is "*defining and incorporating strategic outcomes (that address a range of societal challenges*" (p.13). However, the document does not specify elements of public value or metrics to assess them.

A2.8 Guidance from Professional Associations and Think-tanks

In recent years, several professional associations and think-tanks have produced papers and frameworks for measuring and maximising public value in infrastructure projects. Others have produced decision-support tools and databases.

Papers

The UK Green Building Council has released a paper (UKGBC 2021) arguing that the definition of public value should refer to an identified group of people impacted and a set of agreed outcomes that would improve their quality of life (Figure 42).

Figure 42: Outcomes associated with public value (UKGBC 2021)

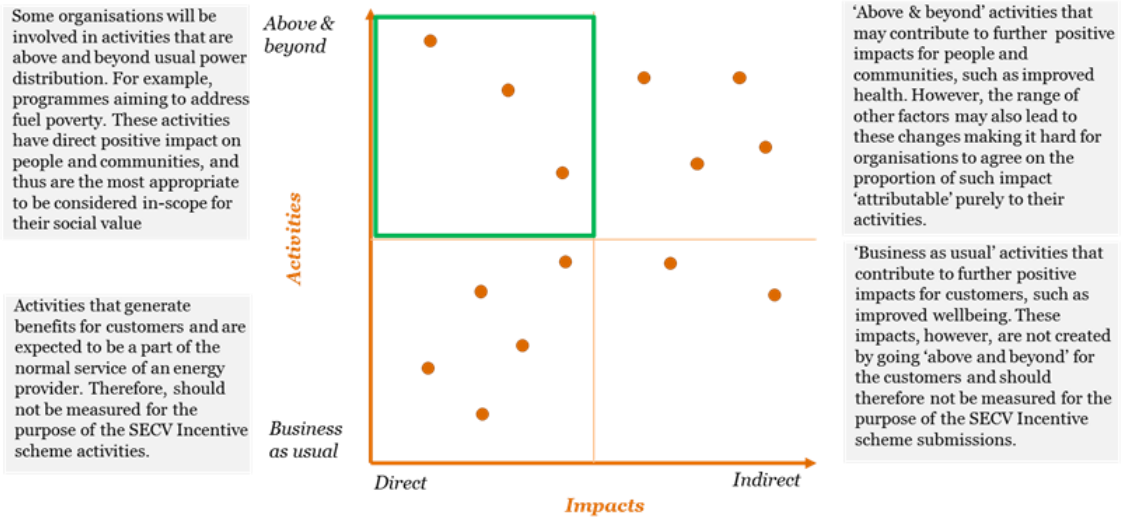
Social	Economic	Environmental
Community networks	Employment	Sustainable transport options
Community engagement	Skills	Green spaces
Local identity	Small businesses	Air quality
Diversity of building uses	Affordable housing	Resource use and waste
Security and safety	Physical resilience	Biodiversity & urban greenery
Public spaces	Accessibility	Warm, damp-free housing

A PwC study for Western Power Distribution (PwC 2017) reviewed best practice and presented qualitative evidence (from interviews to key institutions) to drawn out principles for public value measurement. The elements of public value are related to three types of impact from organisation's activities:

- Social impact: health, education, community cohesion
- Environmental impact: use of natural resources and emissions to air, land and water
- Economic impact: economic growth (output or value added), associated changes in employment, contribution to public finances (taxes on profits, people, production, property and environmental impact)

According to this report, public value can be defined as the activities outside the usual remit of an organisation that generate direct benefits on people and communities (green box in Figure 43). Some activities outside the usual remit generate benefits but it is difficult to isolate the part of those benefits directly affected by the company's activities.

Figure 43: Potential scope of public value (PwC 2017)



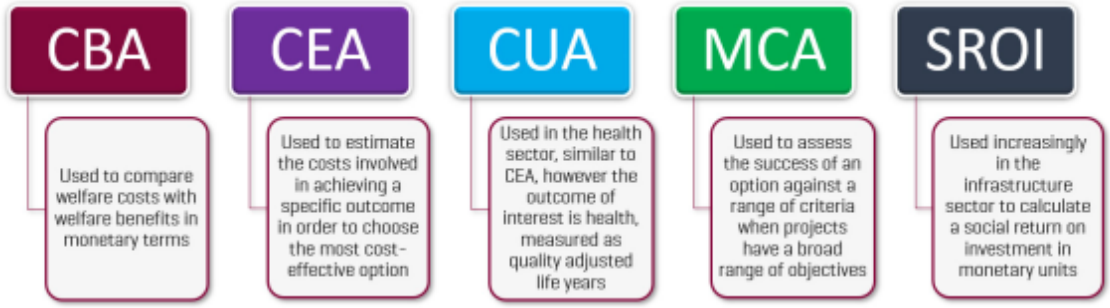
A paper by the Institute for Civil Engineers (ICE 2020), based on quantitative and qualitative research, argues that public value should go "*beyond just delivering employment, apprenticeships and SME involvement during construction*" to encompass other ways in which infrastructure can "*improve the lives of local people and deliver multiple benefits*" (p.vi). For example, "i*nfrastructure projects can create jobs for previously unemployed people, nurture specialist supply chains, improve local air quality and the urban environment, remove barriers to social inclusion, and ultimately increase the well-being of individuals and communities*" (p.3). The paper states that, currently, public value is mainly considered during the procurement and construction stages, missing opportunities at the strategic brief and design stage. One of the main barriers to deliver public value is the inconsistency of definition and measurement methods.

Finally, a paper by the Royal Institution for Chartered Surveyors (RICS 2020) identifies elements of public value associated with infrastructure projects (Figure 44). The paper also reviews five main approaches to measure public value (Figure 45): Cost-Benefit Analysis (CBA), cost-effectiveness analysis (CEA), cost-utility analysis (CUA), multi-criteria analysis (MCA), and social return on investment (SROI).

Figure 44: Elements of public value (RICS 2020)

Wider societal	Environmental
• Improved mental and physical health	• Reduced carbon emissions
• Improved local environment	• Improved air quality
• Reduced crime	• Reduced noise pollution
• Reduced congestion	• Increased biodiversity
• Improved social relations	• Wildlife protection
• Enhanced skills and knowledge	• Increased renewable energy
• Sustained employment	• Reduced energy use
• Better workplace safety	• Reduced waste
• Fairer distribution of benefits	• Reduced water use

Figure 45: Approaches to measure public value (RICS 2020)



Frameworks

Social Return on Investment is a framework to value the wider benefits generated by an organization or project. In 2012, the SROI Network (now Social Value UK) issued a step-by-step guide to this method (SROI 2012). The stages of the method are:

- Establishing scope and identifying stakeholders
- Mapping outcomes (how the business activities use inputs to deliver outputs which result in outcomes for stakeholders)
- Evidencing and valuing outcomes (finding data to show whether outcomes have happened and then valuing them)
- Establishing impact (assessing whether the outcomes result from the business activities)
- Calculating the Social Return on Investment (comparing net benefits with investment)
- Reporting, using, and embedding

Despite the growing popularity of Social Return on Investment, according to RICS (2020) and Fujiwara (2015), this framework does not define public value in a consistently measurable way, such as impacts on people's wellbeing or quality of life.

The Social and Human Capital Protocol (SHCC 2019) is a framework to identify, measure, and value direct and indirect impacts of businesses on social and human capital. The framework was developed based on input from businesses, experts, and public consultation. The protocol also includes a list of relevant social and human capital issues (Table 26). Other examples are provided in Figure 46. The protocol details a series of steps to integrate social and human capital considerations in business. The steps are similar to the Social Return on Investment steps. Of relevance to this report are the steps to:

- Define the pathway between the business activities and the impacts.
- Measure the changes in human and social capital
- Value the impacts (using qualitative, quantitative, or monetary valuation methods)

Figure 46: Examples of businesses' human and social capital impacts (SHCC 2019)

Table 26: Relevant social and human capital issues (SHCC 2019)

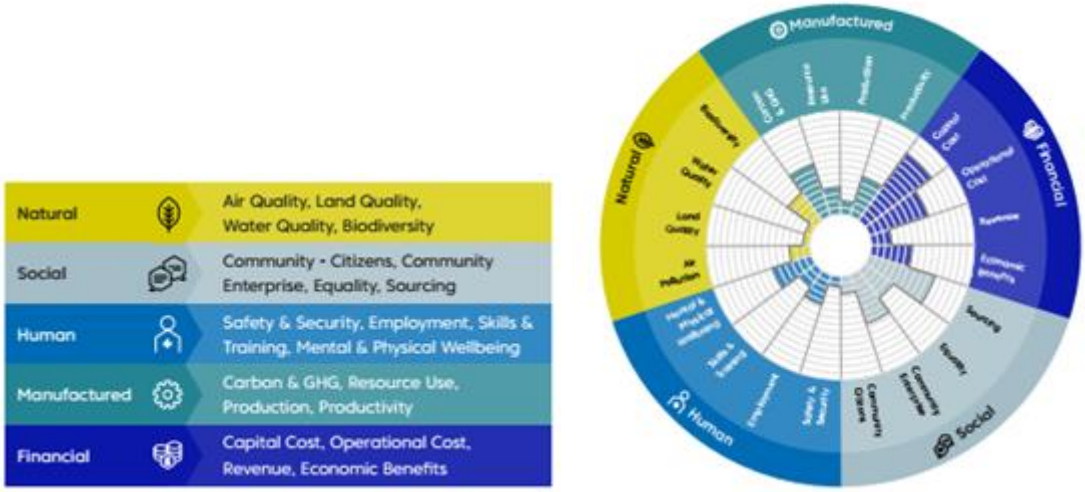
Employment and remuneration
Inclusion and diversity
Skills and knowledge

Health and safety
Labour relations
Value chain relationships
Access to essential services
Personal security in the workplace and the community
Privacy
Access to land and culture
Physical and economic freedom of movement
Law and order

Tools and databases

The Construction Innovation Hub developed a Value Toolkit, including decision-support tools to deliver measurable value improvement (CIH 2020). The rationale is that a broad range of metrics needs to be considered to account for economic, social, and environmental factors across an investment lifecycle. Some tools build a "value profile" for an investment, based on a set of metrics (Figure 47). Other tools measure performance through the investment lifecycle.

Figure 47: CIH Value toolkit: value profile (CIHT 2020)



The Rail Social Value Tool, provided by Rail Safety and Standards Board Limited and Loop (RSSB 2021) is a decision-support tool (and related guidance) to measure public value in the rail industry. Twelve areas of impact were identified, (Table 27), along with 520 indicators, 239 of them monetised. The tool calculates Social Return on Investment.

Table 27: Impact areas defining public value (RSSB 2021)

Objective	
Employment, training, and skills	Apprenticeships created/retained; job creation; job loss; jobs safeguarded; local employment; local recruitment; graduates; internships; mentoring; in-work training; learning interventions; work experience sessions; work trials; kickstart
Educational attainment	Early engagement interventions; educational/curriculum support/ work experience placements/sessions
Supply chain resilience	Management of environmental and social risk; sustainability capability; cyber essentials; supply chain collaboration
Supply chain capacity	Inclusive procurement; local supply; SMEs; start-ups; VCSEs; mutuals; business development support
Rail accessibility	Diversity impact assessments; inclusive design features; staff disability awareness training; disabled passenger experience; stakeholder engagement in design of assets/services; support for people to travel; increased access
Workforce equality, diversity and inclusion	Employment and training of people with disabilities; Employment & training of other under-represented groups; diversity reporting; financial inclusion; employee satisfaction, participation & contribution; equal pay; modern slavery risk management; five foundational principles of good work
Community and charity	Charitable/community volunteering; participation in & access to heritage/art; community initiatives; community use of space/facilities; considerate construction and maintenance; experience of crime/vandalism; fundraising; in-kind donations; station adoption initiatives
Stakeholder engagement and customers	Commercial estate customer satisfaction; complaints management; stakeholder engagement and consultation
Safety, health and wellbeing	Community health and wellbeing; physical activity and active transport; rail safety engagement; secure station accreditation; infrastructure features to prevent harm; staff interventions to prevent harm; staff training to prevent harm; station improvements
Economic development	Townscapes; housing stock change; non-residential space; development impact; visitor spend; match funding

Climate and environment	Carbon; climate adaptation; biodiversity; air quality; noise; light; green and public spaces; waste; water; townscapes
Covid-19 recovery	-

Finally, the Housing Associations Charitable Trust (HACT) developed the UK Social Value Bank (https://hact.org.uk/tools-and-services/uk-social-value-bank), a set of tools to help social housing organisations to measure their social impact.

A2.9 Expert Views on Public Value

Public value has been a topic of general interest in recent years, and object of independent position papers by researchers and institutions. For example, there is increased interest among experts on the role of public value as one of the goals of private companies. Mayer (2018) argues that limiting negative impacts on society and the environment is not enough. Companies should proactively find opportunities to create positive impacts. Mazzucato and Ryan-Collins (2019) have a similar view for the public sector, rejecting a "market failure" framework and defining public value as something created by public and private sector actors co-shaping markets in line with public purpose.

Cave and Wright (2021) argue that public value is particularly relevant in the water industry because of the diversity of potential wider impacts (public health, environmental impacts, climate change and resilience, community impacts, distributional impacts) and because the regulator (Ofwat) has been "*a pathbreaker in requiring its regulatees to define their wider purposes and show that they are pursuing them*" (p.8). Cave and Wright (2021) also argues for a decentralized approach to public value, in which public value should be identified by companies in collaboration with the public, not by the regulator. The role of the regulator would be to support and incentivise the companies in pursuing public value. In addition, the authors argue that the diversity of public interests is not always represented by the "public as customers" and suggest the use of citizen juries.

Some of these ideas are also present in the report on the measurement, management and growth of public value published by Nesta, an innovation foundation (Mulgan et al 2019). The document stresses the need for more explicit measurement of value, using credible evidence and robust methods, complemented with deliberative methods such as citizen juries. Some principles are also proposed for measuring value, the two most relevant for this review are:

- "something should only be considered valuable if citizens - either individually or collectively - are willing to give up something in return for it" (p.37).
- Metrics of value should be comprehensible and plausible to the public, and not only to specialists - "if it doesn't help to educate the public about choices, and to enrich the democratic process, then it's likely at some point to be rendered irrelevant by raw politics" (p.38).

The importance of customer and citizen views is also emphasized by Sustainability First (2021). This is a discussion paper with general recommendations on how engagement can maximise public value in the water and energy sectors. It recommends that companies, regulators, and public interest groups should agree on 'social return on investment' metrics to identify public

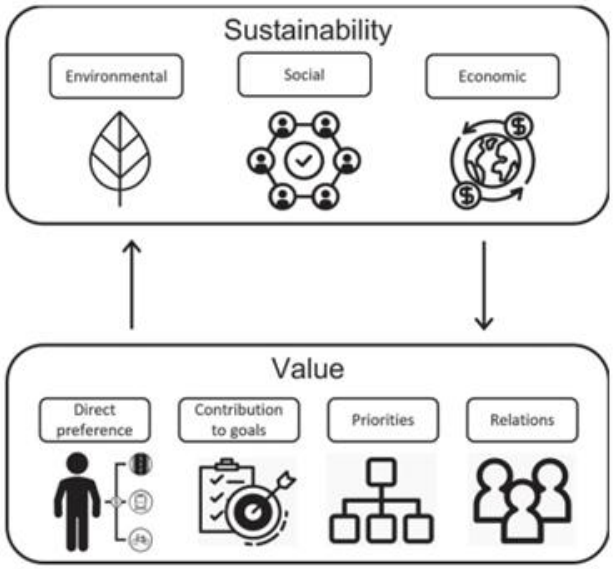
value and provide transparency about the trade-offs made in decision-making. In addition, there is a need to:

- engage people as citizens and not just as customers, especially in the case of assessment of preferences regarding flood resilience.
- embed the preferences of future consumers in decision-making

Zuluaga et al (2021) propose a framework for value in infrastructure that is related to (economic, social, and environmental) sustainability (Figure 48). The value can be conceptualised in four different ways (following Tadaki et al 2017):

- As a magnitude of preference that an individual or a group has for an alternative or attribute relative to others - this is the concept underlying the willingness-to-pay approach.
- As the contribution of an action or object to user-specified goals, objectives, or conditions - this assumes that the overall preference of a group may differ from the aggregation of individual preferences (the case, for example, of greenhouse gas emissions)
- As individual priorities or values (i.e. drivers behind individuals' actions and decisions). According to Zuluaga et al (2021) this is the concept closer to the notion of public value, i.e. "*the collective aspirations that should guide public decisions and operations*" (p.5).
- As relationships between communities or individuals with their environment (i.e. value does not arise from individuals, community, or the environment itself)

Figure 48: Conceptual framework of value and sustainability (Zuluaga et al 2021)



A2.10 Conclusions

General conclusions

The steer being given to water companies for the development of water resources options is that opportunities to achieve public value should be sought, that their value should be measured, and that options that maximise public value should be implemented, provided that customers are willing to pay any excess costs that the wider public value opportunities impose.

This is consistent with the increased attention to public value in the water sector, such as guidance regarding the development of best-value water resources management plans, and other general guidance issue by the regulator and other institutions. Other sectors (e.g. energy, construction, rail travel) have also developed frameworks for public value measurement. There is also increased interest in public value at the national level, as shown in the Social Value Act and in frameworks developed to apply the principles set in that legislation.

Nevertheless, several documents mention that currently, public value is not fully embedded in the companies' culture, and public value reporting is uneven. In other sectors, public value thinking is still restricted mostly to the procurement and construction stages.

Ofwat public value guidance includes the key principles that 1) opportunities for public value should be explored, and 2) customer willingness to pay needs to be demonstrated. The RAPID guidance on Strategic Resource Options in the water sector is brief, but is clear that there needs to be a consistency between Gate Two submission and water resources management plans in terms of best value and solution benefits.

What is included in public value?

Most guidance documents lists the high-level types of public value that companies should deliver. These types are in most cases split into three main groups: economic, social, and environmental. Table 28 synthesizes the information reviewed in this chapter, listing the public value benefits mentioned in guidance documents that are most directly applicable to the case of Strategic Resource Options in the water sector. Environmental aspects are the ones mentioned more often in guidance documents.

Table 28: Public value benefits most applicable to Strategic Resource Options in the water sector

Economic	Social	Environmental
■ Economic growth ■ Jobs ■ Training	■ Human health ■ Well-being ■ Recreation ■ Cultural heritage ■ Community cohesion	■ Biodiversity ■ Carbon emission reductions ■ Flood risk ■ Air quality ■ Landscape ■ Green space

How should it be delivered?

Engagement with customers, citizens, and stakeholders is emphasized in all guidance documents. The public value sought by companies should reflect what society wants (and is prepared to give up something in return for it).

However, it is mentioned in several documents that delivering public value cannot compensate for shortcomings in the delivery of the core services provided by the water companies.

How should it be measured?

Guidance document emphasize the need for robust evidence on the effects of all options, and recommend monetizing (expected) public value where possible. The development of multi-criteria decision analysis is recommended. Companies should also provide a balanced view of the public's priorities. Customer valuations are recommended. Databooks such as those included in the ENCA (Enabling Natural Capital Approach) framework can also be used.

The Water Companies' regional plans already include a series of metrics. Other possible metrics can be found in more general guidance (e.g. National TOMs).

A3. Perceptions and Preferences

This chapter is a review of the literature on perceptions and preferences regarding public value in the UK water industry.

A3.1 General Views

Water Resources East has recently commissioned customer engagement work to understand perceptions and preferences regarding water resources management and delivering a best value plan (Blue Marble 2021). The research used qualitative methods and included households and non-household customers, and other stakeholders.

The principle of a best value plan was accepted by participants - it is necessary to consider wider environmental implications of business e.g. contribution to achieving net zero emissions. However, consumers do not necessarily agree with the idea of this plan affecting bills directly.

Participants also want companies to prioritise the core business activities (protection of environment, managing flood risk, drought resilience) over public value (local economy, consulting customers, public amenities). This is clear from Figure 49, which shows the participants preferred 'best value plan' objectives.

In addition, participants support restoring past environmental damage but not necessarily improving environments due to cost implications.

Figure 49: Preferred 'best value plan' objectives (Blue Marble 2021)

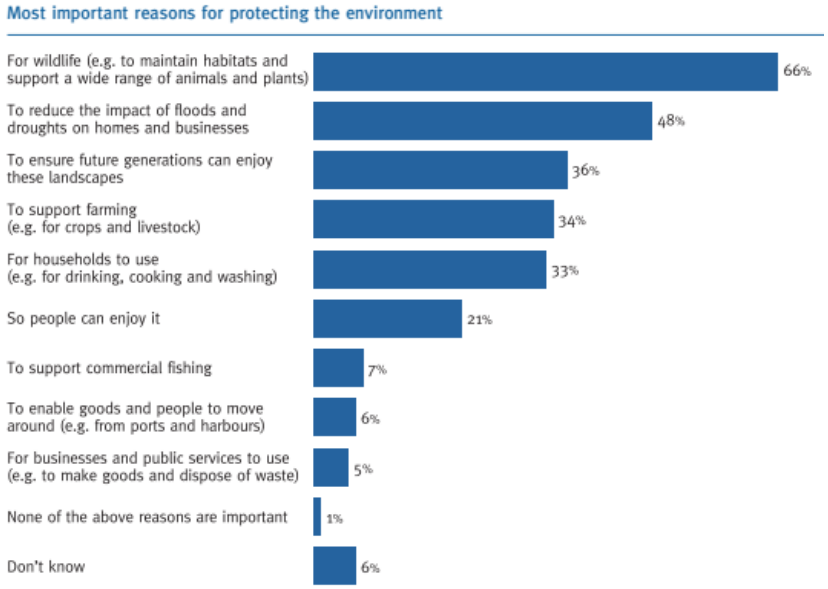
Objective	% of Top 4 Best Objectives
Affordable water bills over the long term	70%
The most from what we have (reducing leakage, encouraging customers to use less)	68%
A plan that that is adaptable in case of new/emerging conditions	65%
Ambitious targets to reduce carbon emissions and use renewable energy	49%
Better natural habitats: supporting wildlife & biodiversity	44%
A reduction in flood risk to communities	40%
Higher levels of resilience to drought (reducing the risk of emergency measures)	39%
Creating attractive water environments for recreation and wellbeing	17%
What regional organisations, businesses and consumers say they want	6%
Job creation and benefits to the local and regional economy	5%

In 2013, the Environment Agency initiated a public dialogue on Significant Water Management Issues to assess public views to be fed into the updated River Basin Management and other Water Framework Directive commitments. The initiative included seven public dialogue

workshops involving 119 members of the public and a survey with 867 participants (EA 2014). The initiative produced some results on what people value and on what they perceive as societal benefits from the water environment.

Workshop participants generally identified the inter-relatedness of the benefits provided by water and "*there was some frustration about trying to separate the benefits from each other*" (EA 2014, p.19). In addition, the general view in scenario deliberations was that it was very difficult to balance the many different factors that must be taken into consideration. However, economic factors were considered important in decision-making. For example, wildlife and bathing water quality were considered important factors because of their impact on tourism, employment, and the local economy, rather than their intrinsic value. The survey showed that environmental aspects are also important: 84% consider protecting the environment to be important. The main reasons were to protect wildlife and to reduce the impact of floods and droughts (Figure 50).

Figure 50: Reasons for protecting the water environment (EA 2014)



A3.2 Specific Types of Schemes

A few studies have looked at perceptions and preferences about flood management schemes. D'Sousa et al. (2021) assessed public perceptions related to flood management schemes. The study involved participants sorting images of different types of schemes into three piles, representing the best, neutral, and the worst options for flood risk management, thinking about appearance, benefits to wildlife and effectiveness as a flood risk management scheme. The main result was that even though the public perceived natural flood management schemes to be less effective to mitigate flooding than natural flood management, it generally held favourable attitudes towards the latter because of its association with attractiveness and benefits to wildlife. The authors suggest that highlighting the attractiveness and wildlife benefits in public communications could improve the public acceptance of natural flood management schemes. However, the study found a high degree of heterogeneity among preferences of different individuals.

Williams et al. (2019) also found a preference for natural flood management options based on the expected benefits in terms of green space and wildlife habitat.

Lamond and Everett (2019) found that the inclusion of features targeted at leisure and recreation in natural flood management areas improved people's willingness to contribute to the maintenance of the areas.

A3.3 Conclusions

There is little evidence on public perceptions and preferences about public value in the water industry in the UK. The existing evidence suggests that customers welcome the idea of a best value plan, with some caveats: the priority should be to prioritise the core services provided by water companies. There is some evidence on concern about environmental issues.

A4. SRO Gate One Submissions

A4.1 Introduction

This chapter focuses on the Gate One submissions for the eleven specific Strategic Resource Option schemes that are the focus of the present study, looking at the expected impacts each scheme will have, the options for public value, and relevant results on customer engagement in relation to public value.

A4.2 Strategic Resource Options

Table 29 shows the description of the eleven Strategic Resource Option schemes and the documents reviewed for each scheme.

Table 29: Strategic Resource Options (SRO)

Name and reference	Description	Gate One submission document (*): other documents reviewed
Minworth	A source of raw water flow augmentation to support the Severn to Thames Transfer SRO and/or the Grand Union Canal SRO, or a combination of the two	Affinity Water and Severn Trent (2021)
Grand Union Canal	Use existing canal infrastructure to transfer treated wastewater from Minworth in the Midlands to Affinity Water in Hertfordshire and North West London.	Affinity Water, Severn Trent, and Canal & River Trust (2021)
London Reuse	Four potential schemes. Abstracted effluent or sewage would be treated through an Advanced Water Recycling Plant, or a Tertiary Treatment Plant and discharged to the River Thames or the River Lee Diversion respectively where it can be abstracted as a raw water resource	Thames Water (2021)
South East Strategic Reservoir	Raw water reservoir in Oxfordshire providing storage and a resilient supply of raw water to the River Thames during periods of low flow, for release and subsequent re-abstraction in London or for transfer to other water companies in the south-east.	Affinity Water and Thames Water (2021) (*) Jacobs (2020)
Thames to Affinity Transfer	Raw water transfer. Three possible 'corridors': the fluvial Thames; West London Re-use; East London Re-use. All would include new treatment works and conveyance routes.	Thames Water and Affinity Water (2021a) (*) Thames Water and Affinity Water (2021b)
Southern Water Recycling	An alternative to Fawley desalination in Southern Water's Water Resources Management Plan, which could provide up to 61 million litres of water per day	Southern Water (2021)
Anglian to Affinity Transfer	Transfer of water from the Anglian Water region to supply Affinity Water customers. Options for source water are the proposed South Lincolnshire Reservoir, the proposed Fens Reservoir and the River Trent.	Anglian Water and Affinity Water (2021a)
South Lincolnshire Reservoir	A regional water resource solution in the Anglian Water region to support supply to Anglian Water customers and Affinity Water customers via the associated Anglian to Affinity transfer solution.	Anglian Water and Affinity Water (2021b) (*) MottMacDonald (2021)
The Fens Reservoir	Solution in the Anglian Water region to support supply to Anglian Water and Cambridge Water, with a possibility to also support Affinity Water via the Anglian to Affinity transfer solution. Water would be abstracted from the Ouse catchment when river flows	Anglian Water and Cambridge Water (2021)

	allow and transferred to a newly constructed reservoir in the Fens	
Thames to Southern Transfer	Water transfer from the Thames Water area to Southern Water's Hampshire area, improving resilience to the South East region through better connectivity. There is not currently surplus water in Thames Water resource zones and therefore a new source of water will need to be developed (the Severn Thames Transfer and/or South East Strategic Reservoir Option).	Thames Water and Southern Water (2021)
Severn Thames Transfer	A raw water transfer, up to 500Ml/d, from the River Severn into the River Thames to support the South East of England during drought events. The water would be provided from the River Severn itself, with additional sources of water provided by Severn Trent Water and United Utilities, if needed.	Severn Trent Water, Thames Water, and United Utilities (2021)

A4.3 Public Value References (High-level)

Table 30 shows all the references made to public value in the submission documents, split into three main groups: economic, social, and environment. The table shows only references to high-level types of public value. The numbers in bold are the sections of the submission document where the reference is made. As shown, most of the public value potential is environmental, with flood risk, biodiversity/habitats, and carbon reductions mentioned in several documents. Social aspects are mainly improved recreation potential. The main economic benefit is job creation.

Table 30: Strategic Resource Options: references to public value in Gate One submissions

	Public value		
	Economic	Social	Environmental
Minworth	"increased **employment** through construction and the operational phases of the project" **[5.24]**		"reducing the **flood risk** where construction intersects with current areas of known flood risk" **[5.24]**
Grand Union Canal	"Additional **employment** opportunities, particularly around the Minworth WwTW site and the abstraction points" **[5.25]** "**economic benefit** where the new works reduce the risk of flooding" **[5.25]**	"**Leisure boating** at specific locations, where an increase in water levels on the GUC may lead to less risk of unplanned canals closures during dry spells." "Wider **recreation** benefits arising from improved access and facilities" **[5.25]**	"interventions within the design and construction of the routes could reduce **flood risk**" **[5.25]** "Benefits associated with flow support into designated sites and areas of **wildlife habitat**" **[5.25]** "**biodiversity enhancements** associated with improvements to banks along the route, and measures included in the designs around lock upgrades or bank raising" **[5.25]** "**Thermal energy abstraction** associated with additional flows and potentially occurring all along the canal or pipeline route." **[5.25]**

London Reuse	"Creation of local **jobs** during construction and operation" **[5.19]**		"Potential for offsite **habitat enhancement** and resulting increase in NC and ecosystem service provision".**[5.19]** "Improved dissolved **oxygen concentration** in the upper tideway" **[5.19]**
South East Strategic Reservoir		"Visitor facilities for water and land based recreation and amenity, education facilities would contribute to improved **health and wellbeing** from recreation, access to new greenspace, as well as opportunities for community cohesion. **[5.2]** "The reservoir presents a significant asset in terms of **recreation**, water resource, attracting development and increasing tourism potential in the local and wider area" **[5.2]**	"**Biodiversity** (Major Beneficial) - Delivered through a commitment to Biodiversity Net Gain and the provision of habitat creation, including grassland and aquatic habitat of a higher nature conservation value than those lost." **[5.2]** "increase **resilience of the environment** by having capacity to release water into river during low flow and drought conditions and may indirectly help reduce abstraction in more vulnerable areas that would be exacerbated by drought conditions." [**5.2]** "**Landscape** (Moderate beneficial) - Landscape-led design and mitigation strategy ensure embedded mitigation, good environmental design integration, and an environmentally sustainable development that will contribute to an overall improvement in the landscape surrounding the reservoir." [**5.2]**
Thames to Affinity Transfer		"Providing programmes on water at local **educational** facilities" **[2.13]**	"**habitat compensation**, creation and/or species relocation schemes. (…) opportunities for **amenity and biodiversity improvement** through habitat creation, extensions or changes to public rights of way networks and improvements to existing habitats as part of reinstatement." **[10.9]**

Southern Water Recycling			"Contribution to net **biodiversity** gain" [5.1.3.1] "Wider environmental benefits of **restored habitat**, such as carbon sequestration, air and water purification" [5.1.3.1] "**carbon sequestration** effect of habitat re-creation" [5.1.3.1] "Habitat restoration within the near National Parks could create wider social benefits, such as improved **visual amenity**" [5.1.3.1]
Anglian to Affinity Transfer		"Opportunities for reinstating land to achieve potential positive community effects… for example, by improving access to **recreational and open space** and improving access to **community resources**." [4.6]	"Opportunities for compensatory **habitat** creation or habitat reinstatement should be explored, as well as opportunities to improve the existing habitats and provide offsetting planting of trees." [4.6]
South Lincolnshire Reservoir	"Increased access to water for **agriculture**" [5.7] "**Economic growth** enabled by increased water supply" [5.7] "**job** creation" [5.7]	"Potential **tourist and leisure** destination" [5.7] "Enhanced **access and connectivity** – recreational provision of footpaths, cycle paths and nature trails will provide positive opportunities for the local community and other visitors." [5.8] "Visitor centre/outdoor recreation hub – multi-use venue that can both serve on-site **recreational** activities, school visits, corporate workshops and serve as a **community** hub." [5.8]	"enhanced **biodiversity** in the region and habitat creation; **carbon sequestration**; and **navigation**." [5.7] "**habitat** compensation, creation and/or species relocation schemes" [5.7] "Wetland creation – creation helps promote **ecological benefits**, restore wetland landscapes and promote sustainable development" [5.8] "Floating island **ecosystems** – riparian ecosystems are critical for many species of fish and aquatic life which can provide a measurable increase towards Biodiversity Net Gain" [5.8] "Species-rich meadow creation and woodland enhancement -– wildflower measures offer a diverse and attractive **habitat** for invertebrates, birds and mammals. Native shrub and woodland planting will help link existing woodland links and enhance natural wildlife corridors" [5.8]

The Fens Reservoir		"Enhanced **access and connectivity** – recreational provision of footpaths, cycle paths and nature trails will provide positive opportunities for the local community and other visitors." **[5.6]** "Visitor centre/outdoor **recreation** hub – multi-use venue that can both serve on-site recreational activities, school visits, corporate workshops and serve as a community hub." **[5.6]**	"Wetland creation – creation helps promote **ecological benefits**, restore wetland landscapes and promote sustainable development" **[5.6]** "Floating island **ecosystems** – riparian ecosystems are critical for many species of fish and aquatic life which can provide a measurable increase towards Biodiversity Net Gain" **[5.6]** "Species-rich meadow creation and woodland enhancement –– wildflower measures offer a diverse and attractive **habitat** for invertebrates, birds and mammals. Native shrub and woodland planting will help link existing woodland links and enhance natural wildlife corridors" **[5.6]**
Thames to Southern Transfer	"there is the potential for enhancements to be applied during operation in relation to reinstating **land** to achieve potential positive effects and public value" **[5.18]**		"The transfer would provide significant **resilience** benefits to the South East Region, improving connectivity within the region and maintaining reliable supplies to customers in extreme drought events" **[2.16]**
Severn Thames Transfer	"Supporting **economic and population growth** by improving the reliability of regional water supplies" **[5.15]** "Creating **local economic and employment opportunities** during construction works" **[5.15]**	"**Recreational** and/or **educational** benefits" **[5.15]**	"Greater **resilience to climate change** and enhanced reliability of water supplies" **[5.15]** "Enhanced **biodiversity** value" **[5.15]** "**air quality** .(…) "natural hazard **(flood) regulation**, **climate regulation**, and **carbon sequestration**". **[5.39]**

Table 31 shows mentions of public value in customer engagement reported in scheme submission documents.

Only three documents mention public value. Amenity benefits of canals and reservoirs are mentioned as a type of public value welcomed by customers, in the context of the Grand Union Canal and South East Strategic Reservoir projects, respectively. Environmental protection is also given a high priority by customers, in the context of the South East Strategic Reservoir.

Public value is mentioned in the Thames to Southern Transfer submission document as a reason for customer preferences about types of schemes.

Table 31: Strategic Resource Options (SRO): mentions of public value in customer engagement

Name	Customer engagement: mentions of public value
Minworth	No information
Grand Union Canal	"Customers.. welcome the added **amenity value** that canals bring in terms of recreation and wellbeing" [8.3]
London Reuse	No information
South East Strategic Reservoir	"Customers place a high priority on **environmental protection**" [8.2] [Reservoirs] are also an asset for the local community with **wildlife and amenity benefits** alongside their functional purpose. [8.2]
Thames to Affinity Transfer	No information
Southern Water Recycling	No information
Anglian to Affinity Transfer	No information
South Lincolnshire Reservoir	No information
The Fens Reservoir	No information
Thames to Southern Transfer	"Transfers via river or canal are considered to be more appealing than pipeline options because they are perceived by customers to have wider benefits and fewer negative impacts over the functional aspect of simply transferring water between locations" [8.17]
Severn Thames Transfer	No information

A4.4 Public Value (Detailed Initiatives)

All the references to public value previously shown in Table 30 were for high-level types of public value. The South East Strategic Reservoir scheme Conservation, Access and Recreation Strategy (Jacobs 2020) includes detailed initiatives to deliver public value (Table 32).

Table 32: South East Strategic Reservoir scheme: possible initiatives to deliver public value

High-level type of public value	Detailed initiatives
Visitor centre	Conference centre Education/training facility Restaurant/café/welfare facilities Education and research Centre Viewing platform
Transport infrastructure	Integration with station Integration with cycle network New links
Landscaping	Viewing platforms Beach area Reservoir island Boardwalk
Farming	Space for agricultural activities Social farms Farm-to-table set up with café
Wetland centre	Meadow creation Creation of specialist habitats such heathlands, chalk grasslands, etc. Link in with flood alleviation areas Reptile hibernacula/log piles and brash piles Boardwalk adjacent to flood alleviation area Inclusion of fish farm/ponds
Butterfly bank	
Outdoor BBQ and picnic facilities	
Water-based recreation and amenities	Water sports provision and angling Partnering with local water sport clubs Recreation hub for equipment rental
Ornithology Infrastructure	
Bridleway, Cycle Trails and Walking Paths	Green trail Sculpture trail Cycle hire Secure cycle facilities
Car park	
Land based recreation and amenities	Sports and Recreation Facilities Natural Amphitheatre Land based informal outdoor sports such as: Kite Flying, Skate Park, Orienteering Partnership with local Equestrian Centres Children's Playground - nature-themed playground equipment, education about the site and how it works Outdoor Recreation Hub/storage facility
Partnerships	Partnered with ornithological society Partner with cycling and walking groups Partner with Education & Research Centres (University) Partner with Angling groups and other water sports clubs
Renewable energy	Renewable energy generation, hydro power or wind Floating Solar Panels Biomass on site Green roof on visitor centre

The South Lincolnshire Reservoir Strategic Environment Assessment also mentions some initiatives that can help to deliver landscape benefits (Mott MacDonald 2021 p.1):

- planting on embankments
- floating wetlands/ islands
- embankment structuring/ landscape
- contouring and building a visitor centre/ public art space
- creation of footpaths, cycle routes, nature trails and bridleways

A4.5 Other Relevant Information

Further information is available for the Thames to Affinity project (Thames Water and Affinity Water 2021b). Figure 51 shows the proposed wider benefits scope for the Gate Two submission. This includes types of public value, inputs, and metrics. In addition, a Six Capital approach was used to select the relevant capitals: social-relationship building and trust (social and relationships, public value, key stakeholder relationships and customer research/feedback), and natural capital (Figure 52).

Figure 51: Thames to Affinity project: wider benefits proposed scope for Gate Two submission

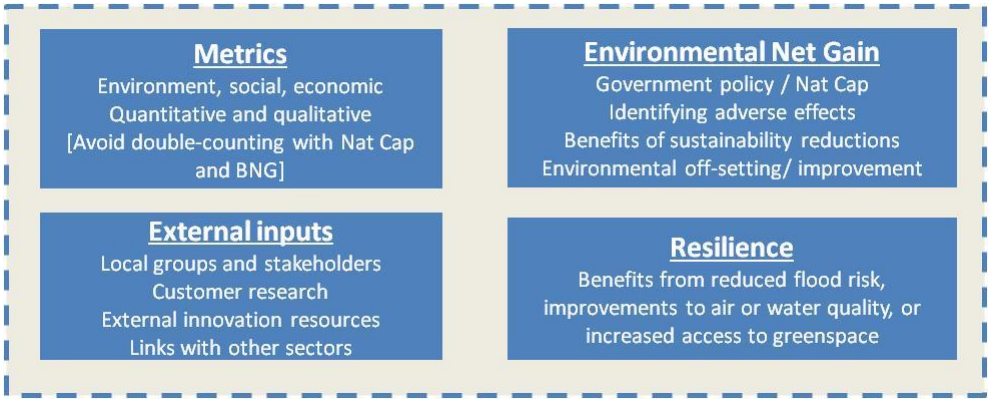


Figure 52: Thames to Affinity project: Six Capitals approach

Financial - financial health and efficiency	Not likely to be required as covered by existing methods to financially value the potential cost. Scope out.
Manufactured - assets (e.g. pipes, treatments, office etc)	Likely to not be required, but having ongoing conversations with those involved in water asset management to determine applicability to Gate 2 Wider Benefits. Scope out.
Intellectual - expert knowledge	Innovative solutions likely to be fed through the delivery of interventions covered by other capitals. Scope out.
Human - capabilities, health and well-being	As this relates to the Water Company's employees competencies, experiences and motivation, this is unlikely to be applicable/measurable at Gate 2. Scope out.
Social - relationship building and trust	**Relevant aspects likely to be covered included social and relationships, public value, key stakeholder relationships and customer research/feedback. Scope in.**
Natural - which are the assets we rely on	**All relevant aspects of Natural Capital from ENCA. Scope in.**

A4.6 Conclusions

Table 33 synthesizes the information of this chapter, showing the high-level types of public value mentioned in the Strategic Resource Option Gate One submissions and related documentation, and detailed initiatives to deliver public value, corresponding to each high-level type.

Most of the high-level types of public value mentioned are consistent with those mentioned in the guidance documents reviewed in Chapter 2. A few elements are not mentioned in the guidance, e.g. land reinstatement and access and connectivity. There is little information on detailed initiatives to deliver public value (all of it coming from a single document). These detailed initiatives are provided mostly for recreational public value, biodiversity/habitats and landscape.

So far, customer engagement has provided few insights on perceptions and preferences for public value.

Table 33: Public value elements mentioned in Strategic Resource Option documentation: high level and detailed initiatives

	High level	Detailed initiatives
Economic	Employment	
	Economic growth	
	Tourism development	
	Land reinstatement	
	Agriculture	Space for agricultural activities, Farm-to-table set up with café
	Job creation	
	Population growth	
Social	Recreation opportunities	Visitor centre, outdoor BBQ/picnic facilities, water-based recreation/amenities, land-based recreation/amenities, ornithology infrastructure , Restaurant/café/welfare facilities, viewing platform, children's playground
	Educational benefits	Conference centre, Education/training/research facility
	Community cohesion	
	Access and connectivity	Link to station, bridleway, cycle trail, walking paths, car parks, cycle hire facilities
Environment	Reduced flood risk	
	Biodiversity/habitats	Meadow creation, specialist habitats, link-in with flood alleviation areas, fish ponds, butterfly bank
	Air quality	
	Carbon sequestration	
	Landscape improvements	Viewing platform, beach area, reservoir island, boardwalk
	Resilience to climate change	

A5. Conclusions

There is increased attention to public value in the water sector, such as guidance regarding the development of best-value water resources management plans, and other general guidance issue by the regulator and other institutions. Other sectors (e.g. energy, construction, rail travel) have also developed frameworks for public value measurement. There is also increased interest in public value at the national level, as shown in the Social Value Act and in frameworks developed to apply the principles set in that legislation. Nevertheless, currently, public value is not fully embedded in the companies' culture and public value reporting is uneven. In other sectors, public value thinking is still restricted mostly to the procurement and construction stages.

Ofwat public value guidance includes the key principles that:

Opportunities for public value should be explored, and

Customer willingness to pay needs to be demonstrated.

The RAPID guidance on Strategic Resource Options in the water sector is brief, but is clear that there needs to be a consistency between Gate Two submission and water resources management plans in terms of best value and solution benefits.

Most guidance documents lists the high-level types of public value that companies should deliver, split into three main groups: economic, social, and environmental. Engagement with customers, citizens, and stakeholders is emphasized. In addition, the public value sought by companies should reflect what society wants (and is prepared to give up something in return for it). However, delivering public value cannot compensate for shortcomings in the delivery of the core services provided by the water companies.

Guidance document emphasize the need for robust evidence on the effects of all options, and recommend monetizing (expected) public value where possible. The development of multi-criteria decision analysis is recommended. Companies should also provide a balanced view of the public's priorities. Customer valuations are recommended. Databooks such as those included in the ENCA (Enabling Natural Capital Approach) framework can also be used. The water companies regional plans already include a series of metrics. Other possible metrics can be found in more general guidance (e.g. National TOMs).

There is little evidence on public perceptions and preferences about public value in the water industry in the UK. The existing evidence suggests that customers welcome the idea of a best value plan, with some caveats: the priority should be to prioritise the core services provided by water companies. There is some evidence on concern about environmental issues.

Strategic Resource Options Gate One submissions consider a variety of economic, social, environmental wider benefits. Most of the high-level types of public value mentioned are consistent with those mentioned in the guidance documents. A few elements are not mentioned in the guidance, e.g. land reinstatement and access and connectivity. There is little information on detailed initiatives to deliver public value. These detailed initiatives are

provided mostly for recreational public value and biodiversity/habitats, and landscape. So far, customer engagement has provided few insights on perceptions and preferences for public value.

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Appendix B

Quantitative Mainstage Questionnaire

3543 QUANT QST FINAL VERSION
SRO Value Added

COMPANY SAMPLE ONLINE AND FACE TO FACE: Thank you for agreeing to take part in this important study which is being conducted by Accent on behalf of a number of water companies.

They would like to hear from customers to understand your views on how they should plan to maintain future water supplies in your region over the next 25 years. There are lots of options the companies could look at and they are looking for your input to make sure customers' preferences are fully reflected in their plans.

We would really appreciate it if you could spare 15-20 minutes of your time to give your feedback - but it may take longer depending on the answers you give. The results will be used, alongside those of thousands of other customers across the region, to inform where water companies invest the money from bills.

Accent is a member of the Market Research Society and we operate in accordance with its Code of Conduct, which means the responses you give will be held securely and remain anonymous. There would be no follow-up contact resulting from doing this study unless you give permission to do so in your answers.

We appreciate the time you'll spend giving your feedback. As a thank you we'd like to provide you with £5, which you can accept either as a One4All voucher, or as a donation to charity. We'll ask you which is your preferred option at the end of the [ONLINE study/ F2F interview]. You must complete all the questions in this study to be eligible to receive the £5 offer.

COMMERCIAL PANEL: ENSURE NO COMPANY LOGO IS SHOWN: Thank you very much for agreeing to complete this on-line study which is being conducted by Accent, an independent research agency

We just need to ask a few questions to check that you're eligible to take part in this research.

SHOW ALL COMPLETING ONLINE: If completing this survey on a mobile, you may find it easier to view in landscape

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Q1. For the purposes of administering the study and for analysis, we may collect demographic information. You do not have to answer any questions that you do not wish to and if you do you can withdraw your consent for us to process this information at any time. Any personal data collected over the course of this [ONLINE study/ F2F interview] will be held securely and will not be shared with any third party unless you give permission (or unless we are legally required to do so). Our privacy statement is available at www.accent-mr.com/privacy/.

Do you agree to proceeding with the study/interview on this basis?

Yes
No **THANK AND CLOSE**

Q2. **ASK CAPI ONLY. OTHERS GO TO Q6:** In line with government guidelines we have a few questions to check your Covid-19 status. Are you or anyone you have been in close contact with currently experiencing any flu-like symptoms or other Covid-19 symptoms?
INTERVIEWER NOTE: THIS WOULD INCLUDE HIGH TEMPERATURE AND/OR LOSS OF SENSE OF TASTE OR SMELL

Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q3. Have you or anyone you have been in close contact with been diagnosed with Covid-19 within the past two weeks, and not subsequently tested negative?

Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q4. Are you someone who is defined as either Clinically Extremely Vulnerable or Clinically Vulnerable?
INTERVIEWER NOTE: THEY WILL HAVE BEEN INFORMED OF THIS STATUS EARLY ON IN LOCKDOWN

Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q5. Are you currently shielding to protect yourself from Covid-19 or caring for someone else who is especially vulnerable to Covid-19?

Yes **THANK AND CLOSE** On this occasion we will not be able to continue with the survey due to Covid-19 guidelines. Thank you for your time
No

Q6. Do you or any of your close family work in market research or for a water company? **SINGLE CODE**

Yes **THANK & CLOSE**
No

Q7. **ASK ALL**: Are you in paid employment?

Yes
No **GO TO Q12**

Q8. **ASK IF Q7 = 1** How much involvement, if any, do you have in managing the water bills for your business?

I solely or jointly manage the water bills **GO TO Q9**
I don't have any involvement in the water bills **GO TO Q12**
We do not have a mains water supply / do not receive a separate water bill as it is included with other bills **GO TO Q12**

Q9. Are you a sole trader working from home and with no separate business premises?

I am a sole trader and have no separate business premises **GO TO Q12**
I work in a separate business premises

Q10. How many sites does your organisation have in the UK; one or more than one?

One site
More than one site
Don't know

Q11. What is the first half of the postcode of **IF Q10=1 [**the site] **IF Q10=2-3** [the main site for which you are responsible for the water bill]?

INSERT LOOKUP TABLE TO ASSIGN POSTCODE TO WATER CO

Prefer not to answer **CODE AS HH AND GO TO Q12**

CHECK LOOKUP

IF ONE OF TARGET WATER COS SHOW FOLLOWING AND THEN GO TO Q20: Thank you, [F2F I/ONLINE we] can confirm that [water co] is responsible for the provision of water services in your organisation's area.

When thinking about your answers, please respond from the perspective of your organisation's preferences and needs, rather than as what is important to you when thinking about the supply of water to your home.

IF BUSINESS POSTCODE NOT IN TARGET COMPANY LIST

Your company address is not in one of the water company areas we are looking for, but your home address may be.

CODE AS HH AND GO TO Q12

Q12. What's the first half of your home postcode? We will only use this to check who provides your water**.**

INSERT LOOKUP TABLE TO ASSIGN POSTCODE TO WATER CO

IF ONE OF TARGET WATER COS SHOW FOLLOWING: Thank you, [F2F I/ONLINE we] can confirm that [water co] is responsible for the provision of water services for your home area.

Prefer not to answer **THANK & CLOSE**
Not in any target water company area **THANK & CLOSE**

Q13. Which of the following age groups do you fall into? Are you... **SINGLE CODE**

Under 18 **THANK AND CLOSE**
18 to 24
25 to 29
30 to 34
35 to 44
45 to 49
50 to 54
55 to 64
65 to 74
75 or over
Prefer not to say

Q14. Are you the person, or one of the people, in your household who pays the water bills? **SINGLE CODE**

I have complete responsibility for payment
I share responsibility for payment with others in my household
I have no responsibility, but I know it is paid by my landlord and included in my rent
I have no responsibility for payment and I don't know who pays the bills
Other - please tell us what
Don't know **THANK & CLOSE**

FUTURE CUSTOMER = (Q13=CODE 2) AND (Q14= CODES 3 OR 4 OR 5)

ALL OTHER Q14=3, 4 OR 5 THANK AND CLOSE

Q15. Which ONE of the following best describes the occupation of the main income earner in your household? If you or the main income earner are self-employed please tick the option that most relates to the type of work you/they do for the company(s) you/they work for.

- Higher managerial/ professional/ administrative (e.g. Doctor, Solicitor, Board Director in a large organisation 200+ employees, top level civil servant/public service employee etc.)
- Intermediate managerial/ professional/ administrative (e.g. Newly qualified (under 3 years) Doctor, Solicitor, Board Director of small organisation, middle manager in large organisation, principle officer in civil service/local government etc.)
- Supervisor; clerical; junior managerial administrative or professional (e.g. Office worker, Student Doctor, Foreman with 25+ employees, salesperson, etc.)
- Skilled manual worker (e.g. Bricklayer, Carpenter, Plumber, Painter, Bus/Ambulance Driver, HGV driver, pub/bar worker etc.)
- Semi or unskilled manual worker (e.g. Caretaker, Park keeper, non-HGV driver, shop assistant etc.)
- Student
- Unemployed or not working due to long-term sickness
- Casual worker – not in permanent employment
- Full-time carer of other household member
- Retired
- Rather not say **THANK AND CLOSE ONLY DYNATA**

Q16. **IF Q15=10 (RETIRED). OTHERS GO TO Q18**: Does the main income earner have a state pension, a private pension or both?

State only
Private only
Both

Q17. **IF Q16 = PRIVATE OR BOTH. OTHERS GO TO Q18:** How would you describe the main income earner's occupation before retirement?

- Senior managerial or professional (e.g. Doctor, Solicitor, Board Director in a large organisation 200+ employees, top level civil servant/public service employee etc.)
- Intermediate managerial, administrative or professional (e.g. Solicitor, Board Director of small organisation, middle manager in large organisation, principle officer in civil service / local government etc.)
- Supervisor; clerical; junior managerial administrative or professional (e.g. Office worker, Student Doctor, Foreman with 25+ employees, salesperson, etc.)
- Manual worker (with industry qualifications) (e.g. Bricklayer, Carpenter, Plumber, Painter, Bus/Ambulance Driver, HGV driver, pub / bar worker etc.)
- Manual worker (with no qualifications) (e.g. Caretaker, Park keeper, non-HGV driver, shop assistant etc.)
- None of these

Q18. **SEG: CODE AS FOLLOWS**:

IF Q15= 1 or 2; SEG = AB
IF Q15 = 3; SEG = C1
IF Q15 = 4; SEG = C2
IF Q15 = 5-9; SEG = DE

IF Q15 = 10 and **Q16**= State only; SEG = DE

IF Q15 = 10 and Q16 = Private only OR Both and Q17 = 1 or 2; SEG = AB
IF Q15 = 10 and Q16 = Private only OR Both and Q17 = 3; SEG = C1
IF Q15 = 10 and Q16 = Private only OR Both and Q17 = 4; SEG = C2
IF Q15 = 10 and Q16 = Private only OR Both and Q17 = 5; SEG = DE

Q19. Are you:

Male
Female
Prefer to self-identify
Prefer not to say

Q20. **ASK ALL:** Do you have a water meter at your [HH] home [NHH] organisation?

Yes – I/we asked to have one installed
Yes – it was already in the property when I/we moved in
Yes – I/we had to have it fitted, but I/we didn't really want it installed
No – and I/we not interested in getting one
No – but I/we are considering getting one
No – I/we had one, but decided to opt out
Don't Know

Thanks, you're good to go

This research study is being conducted for your water company.

COMPANY SAMPLE/ F2F ONLY: Remember, if you fully complete the survey, we'd like to provide you with £5 which you can accept either as a One4All voucher or as a donation to charity.

We would like start by asking you a few questions about your experiences of your water company.

Q21. [HH] How satisfied would you say you are with the **overall service** provided by your water company? When giving your answer, please think about all aspects of the service they provide, from the water supply itself to the bills you receive.

[NHH] How satisfied would you say you are with the overall service provided by your water company? This could include things like the reliability of the water supply, how quickly leaks in the public highway are fixed and the quality of the water supply itself.

1. Extremely dissatisfied
2.
3.
4.
5.
6. Neither satisfied nor dissatisfied
7.
8.
9.
10. Extremely satisfied

Q22. This time, using a 10-point scale, how much do you **trust** your water company?

1. I don't trust them at all
2.
3.

4.
5.
6.
7.
8.
9.
10. I trust them completely
11. Don't know

Q23. How much [HH] do you [NHH does your organisation] pay for your total water bill – that's the amount for your water and sewerage services? Please select "per month" or "per year" along with your amount.

Per month/Per year **GO TO Q25**
I'm not sure
I prefer not to say

Q24. HH: Which of the following bands do you estimate that your total bill for water and sewerage falls into? The month amounts assume that the bills are paid evenly over a 12-month period, but some customers pay over a different number of months.

SINGLE CODE

Monthly	Annual
Less than £13 per month	Less than £150 per year
£13 - £16 per month	£151 - £200 per year
£17 - £20 per month	£201 - £250 per year
£21 - £24 per month	£251 - £300 per year
£25 - £28 per month	£301 - £350 per year
£29 - £32 per month	£351 - £400 per year
£33 - £37 per month	£401 - £450 per year
£38 - £41 per month	£451 - £500 per year
£42 - £45 per month	£501 - £550 per year
£46 - £50 per month	£551 - £600 per year
£50 - £54 per month	£601 - £650 per year
£55 - £59 per month	£651 - £700 per year
£60 - £64 per month	£701 - £750 per year
£65 - £69 per month	£751 - £800 per year
Over £70 per month	Over £800 per year
I'm not sure	
Prefer not to say	

NHH: Approximately what is your business's average annual water and sewerage services bill?
SINGLE CODE

Less than £500 per year
£500 to £1,499 per year
£1,500 to £2,999 per year
£3,000 to £9,999 per year
£10,000 to £14,999 per year
£15,000 to 29,999 per year
£30,000 to £49,999 per year
£50,000 or more per year
Don't know

Q25. Bill calculation:

USE ANNUAL AMOUNT FROM Q23
USE MONTHLY AMOUNT X 12 FROM Q23
USE MID POINT OF RANGE ANNUAL AMOUNT FROM Q24
USE MID POINT OF RANGE MONTHLY AMOUNT X 12 FROM Q24
SHOW REGIONAL AVERAGE IF NONE OF THE ABOVE APPLIES: SSW: £332/CAM: £375

Q26. **ONLINE PANEL ONLY & HH ONLY, NHH GO TO Q27:** How satisfied are you with the **value for money** of the clean water services you receive?

DP ADD HORIZONTAL SCALE LIKE Q22
Very dissatisfied
Fairly dissatisfied
Neither satisfied nor dissatisfied
Fairly satisfied
Very satisfied
Don't know

Attitudes

We would like to now find out a bit more about your views about various aspects relating to your local area.

Q27. How important to you are each of the following? **[INCLUDE SCALE FROM 1='Not at all important' to 10='Extremely important' AND RANDOMISE ORDER]**

a. The availability of apprenticeships for young people
b. Local employment opportunities
c. The economic benefits of visits to your local area – i.e. tourism and leisure visits
d. The promotion of local heritage and history
e. The promotion of sustainable agriculture, including regenerative farming and re-wilding of areas of countryside to return them to their original state
f. Improving water resources for local farmland to make it more productive
g. Tackling flood risk in the local area
h. The creation of new habitats for wildlife and birds

Recreation

IF HH: The next questions are about a selection of activities you might do for recreation.

Q28. **HH ONLY:** How often do you, or does anyone in your household, do the following recreation activities?

	Often (more than six times a year)	**Sometimes** (between one and five times a year)	**Rarely** (less than once a year)	**Never**
Outdoor water sports activities (e.g. sailing, canoeing, rowing, rafting, paddleboarding, wild swimming)				
Fishing in rivers or lakes				
Picnicking				

Walking, running, cycling or horse riding				
Camping				

Planning for the Future

Please read the following information about water companies' plan for the future. There is a minimum time to view this to make sure all the information is seen, but there is no maximum time – please feel free to read it more than once if you need to.

To cope with the effects of population growth and climate change, water companies need to make a plan about how they can maintain future water supplies in your region in the next 25 years.

This plan may include sites like new reservoirs and water treatment works, and new pipelines and canals to transfer water from one area to another.

When deciding how to design these sites, water companies can create wider positive impacts to the local economy, environment and community; for example, by adding recreational elements like walking paths or campsites, or new habitats for wildlife.

But some of these things will have an impact on bills.

Water companies are therefore seeking customers' views on what additional benefits they should plan for, recognising that these will be paid for through customers' bills.

DP: ADD MIN TIME FOR THIS SCREEN TO BE VIEWED (20s)

Q29. Is the information about why your water company are asking for your views clear and easy to understand?

1. Yes – very easy to understand
2. Yes – quite easy to understand
3. No – quite difficult to understand
4. No – very difficult to understand
5. Don't know

Q30. **ASK IF CODE 3 OR 4 AT Q29. OTHERS SKIP**: What do you find difficult to understand? Please write in as much information as possible.

NEXT PAGE:

In the next exercise you'll be shown a series of 10 questions, each offering a pair of different possible options for a new site, such as a new reservoir, water treatment works, or pipeline or canal for transferring water, that could be in the water company's plan for maintaining water supplies. For each choice, the options have a different mix of project additions. We want to understand which option you would prefer.

An example is shown below:

DP: INSERT WALK THROUGH GIF. ADD MIN TIME TO MATCH LENGTH OF GIF (20S)

Please familiarise yourself with this and then press 'next' to read about the other options. There is a minimum time to view this to make sure all the information is seen, but there is no maximum time – please feel free to view it more than once if you need to.

NEW PAGE:

As you've just seen one of the impacts relates to the change in your water bill. In some options there will be no increase to your bill while in others there will be an increase.

[**IF NHH**] *Increases are shown as a percentage of your water bill. If you receive a combined water and wastewater bill, the increase would apply only to the water component of this.* **[BOTH HH AND NHH]** *If an increase is shown, your annual bill would increase by that amount in one year, and would then remain at that level on a permanent basis. The increase would not be applied year on year, nor would it be reversed the following year.*

When choosing which option you prefer in each case, please consider:

- Whether the impacts shown are important to [HH: you/NHH: your organisation]; and
- Your [HH: household/NHH: organisation] overall income and expenses, remembering that:
- Any money [HH: you pay/NHH: your organisation pays] for these improvements will not be available for [HH: you/NHH: your organisation] to spend elsewhere
- Other bills may go up or down affecting the amount of money [HH: you have/NHH: your organisation has] to spend in general

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Your [HH: household/NHH: organisation's] bills will also be affected by the rate of inflation [**DP: INSERT I BUTTON SHOWING THE FOLLOWING TEXT**: Inflation means that the general level of prices are going up. More money will need to be paid for goods (like a loaf of bread or petrol) and services (like getting a haircut at the hairdresser) each year.

Q31. Choice 1

Q32. Why did you select this option? Please write in as much information as possible. Please use the back button to remind yourself of the choice if needed.

Q33. Choice 2

Q34. Choice 3

Q35. Choice 4

Q36. Choice 5

Q37. Choice 6

Q38. Choice 7

Q39. Choice 8

Q40. Choice 9

Q41. Choice 10

Q42. We would now like to ask you a few questions about the choices you have just made. How strongly do you agree or disagree with the following statements about the choices you have just made?

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
I was able to understand the choices					
I found the options believable					
I found it easy to choose between the options					

Q43. **ASK IF Q42.1 = 1 OR 2. OTHERS GO TO Q44:** Why were you unable to understand the choices?

Q44. **ASK IF Q42.2 = 1 OR 2. OTHERS GO TO Q45:** What was not believable about the options shown?

Q45. **ASK IF Q42.3 = 1 OR 2. OTHERS GO TO Q46:** Why was it difficult choosing between the options?

Those previous questions were focusing on individual sites in the plan. Thinking about your water company's overall approach to projects of this type, please look at the following choice and say which you would prefer your water company to take?

Q46. CV question 1

Q46B Why did you select this option? Please write in as much information as possible. Please use the back button to remind yourself of the choice if needed.

Q47. CV question 2

Q47B: Which of the following best describes how you feel about project additions when large infrastructure projects are being undertaken (such as building a new reservoir, water treatment works, etc). As a reminder you can see a summary of the potential additions by clicking the information button:

SINGLE CODE

1. All large projects should include as many additions as possible to benefit the local community, economy and the environment
2. All large projects should include only those additions that are cost effective to deliver – i.e. where there is a clear case to spend more money to bring long-term benefits to the local community, economy and the environment
3. All large projects should not include any additions

INFORMATION BUTTON: Show list of project additions from SP1

Q47C: In developing plans, water companies have to balance the needs of customers, stakeholders (like environmental groups and councils) and the water environment. We'd like to understand your reaction to some key trade-offs in terms of the companies general approach to planning and where you stand on each.

Please indicate the point on the scale that that most closely reflects how you feel:
ROTATE
7 POINT SLIDER SCALE

- Trying new approaches and innovations to find solutions to challenges/Sticking to tried and trusted approaches that are proven to work
- Looking after the needs of the natural environment first/Ensuring all customers have all the water they want to use at an affordable price
- Infrastructure projects should deliver additions even if they add to the overall project costs/Keeping bills as low as possible
- Doing more to reduce the company's 'carbon footprint' (the amount of carbon dioxide the company adds to the atmosphere through its operations) – even if it costs customers more/Keeping customer bills as low as possible

Finally, a bit more about you

Before we finish there are just a few more questions which will help us to understand different customers and what they want from its water services in the future. The answers you give will be kept confidential, unless you give permission to share them at the end of the survey.

Q48. **ASK HH ONLY**: Is anyone in your household registered on the Priority Service Register? The Priority Services Register is for water customers who may need extra support or additional services - e.g. braille bills, or bottled water deliveries in the event of the water supply being interrupted.

Yes
No
Prefer not to say
Don't know

Q49. **ASK HH ONLY**: A lot of people struggle to pay their household bills. Which of the following best describes how affordable you find your water and sewerage bill and other household bills? Please remember, this research is entirely confidential and that it is only by talking to people in debt, or struggling to pay their bills, that change can be influenced.
SINGLE CODE

1	I always pay my water bill, and other household bills, on time	
2	I always pay my water bill on time, but sometimes struggle, or am late, paying other bills	**STRUGGLING**
3	I sometimes pay my water bill late	**STRUGGLING**
4	I often find it difficult to pay my water bill on time	**IN DEBT**
5	I am rarely, or never, able to pay my water bill on time	**IN DEBT**
6	Prefer not to answer	

Q50. **ASK HH ONLY**: We want to take account of the views of people of all incomes. Which of the following annual income bands does your household fall into? Please take into account the income of all of those in the household before tax and national insurance and include pensions, benefits or extra earnings.

	Per Week	Per Year
A	Up to £315	Under £16,380
B1	£316-£442	£16,381 - £23,000
B2	£443-£721	£23,001 - £37,500
B3	£722-£1000	£37,501 - £52,000
C	£1001+	£52,001+
D	Prefer not to say	

Q51. **ASK HH ONLY:** Thinking about all the people in your household, including yourself, how many people live here permanently for each of these age groups? **IF THERE ARE NO PEOPLE IN YOUR HOUSEHOLD BELONGING TO A CERTAIN AGE GROUP, PLEASE SELECT 'ZERO' FOR IT.**

Up to 10 years	0	1	2	3	4	5+
11 to 15 years	0	1	2	3	4	5+
16 to 65 years	0	1	2	3	4	5+
Over 65 years	0	1	2	3	4	5+

Prefer not to say [exclusive]

Q52. **ASK HH ONLY**: Which of these ethnic groups do you consider you belong to?

WHITE
1. British
2. Irish
3. Any other White background

MIXED
4. White and Black Caribbean
5. White and Black African
6. White and Asian
7. Any other Mixed background

ASIAN OR ASIAN BRITISH
8. Indian
9. Pakistani
10. Bangladeshi
11. Any other Asian background

BLACK OR BLACK BRITISH
12. Caribbean
13. African
14. Any other Black background

CHINESE OR OTHER ETHNIC GROUP
15. Chinese
16. Any other ethnic group

17. Prefer not to say

Q53. **ASK NHH ONLY**: Could you please tell me how many employees your organisation has? If you have more than one office/site/staff working from home, please count all of them in your answer. **SINGLE CODE**

1 (Sole trader)
2 – 4
5 – 9
10 - 19
20 - 49
50 - 99
100 - 249
250 - 499
500 - 999
1,000 +
Don't know

Q54. **ASK NHH ONLY:** What business sector best defines the main activity of your organisation?

- Agriculture, forestry and fishing
- Mining, quarrying
- Utilities and Energy (including electricity, gas, steam and air-conditioning supply)
- Water supply, sewerage and waste management, recycling
- Food, Drink and Tobacco Manufacturers and Other Manufacturing
- Construction (including plumbing, painting, electrical etc)
- Retail (NOT hairdressing), Wholesale, Motor Trades including vehicle repair
- Transport and Storage (including freight, taxis, airlines, bus, rail and warehousing, post offices)
- Hotel, catering, Camp sites, restaurants, cafes, accommodation, pubs
- Information, Telecommunications (including computer, newspaper, radio, TV, news agency, book publishing)
- Banking, Finance, Insurance
- Real estate and property activities
- Professional, scientific and technical activities
- Business Admin and support services (including cleaning, gardening, employment agencies, office services)
- Education (including schools, universities)
- Health and social work (including hospitals, doctors, dentists. charities, nursing care)
- Government and& Defence
- Arts, Recreation, Entertainment (including Libraries, theatres, museums, zoos, sport centres, fitness)
- Other service activities (including Trade Unions, Churches, Repair services, Funeral-related services, Hairdressers)
- Other, please specify
- Prefer not to answer

Q55. **ASK NHH ONLY**: Which of the following best describes your function at work?

General management (eg CEO, MD, General Manager)
IT & Technology
Financial
Marketing & Sales
Operational
Procurement
Administration
Other (specify)

Q56. **ASK NHH ONLY**: What is your job title?

Write in [open text box]

Q57. **ASK NHH ONLY:** How essential would you say the supply of water is to the day-to-day running of your business?

Not at all essential
Not essential
Neither not essential nor essential
Essential
Absolutely essential
Don't know

Q57A F2F ONLY Have you used the Internet via a computer, tablet or smartphone in the last 3 months?

1	No	**DIGITALLY EXCLUDED**
2	Yes	
9	Prefer not to answer	

Q57B Which of the following best describes you?

SINGLE CODE

1	I feel very confident about using the internet	
2	I feel quite confident about using the internet	
3	I don't feel confident about using the internet	**DIGITALLY EXCLUDED**
4	I would rather not use the internet at all	**DIGITALLY EXCLUDED**
9	Prefer not to answer	

Q57C Which of these items do you have in your home and that are available for you to use?

1	Smartphone	
2	Tablet	
3	Laptop or desktop computer	
4	None of the above	**DIGITALLY EXCLUDED**

Q58. **COMPANY SAMPLE ONLY:** We really appreciate the time that you have given us today. Would you be willing to be contacted again by Accent to allow them to clarify any responses you have given today, or to be invited to take part in other related research?

Yes, for both clarification and further related research
Yes, for clarification only
Yes, for further related research only
No

Q59. **COMPANY SAMPLE ONLY:** Thank you for taking the time to give your feedback. Please select how you would like to receive your £5 thank you:

One4All gift voucher – accepted at over 60,000 retail outlets
Donation to Water Aid – a charity who works globally to ensure more people have access to clean water every day
Donation to The Trussell Trust – who run a nationwide network of food banks

This research was conducted under the terms of the UK Market Research Society code of conduct and is completely confidential.

Q1 SYSTEM INFORMATION
Q2 Time interview completed:

INTERNAL USE ONLY: Click here

Online only ☐
CATI only ☐ (DP: add QAX)
CAPI/Tablet ☒ (BCQs: Q13) QAZ2 Paper showcard? Y ☐ N ☐
CATI recruit for online/field ☐ (BCQs: Q19) QAZ3
Field recruit for online/CATI ☐ (BCQs: Q20) QAZ1
Recruit only (ie for qual) ☐

Grid style for mobiles: click here for example

GM 1 ☐ to force mobiles to show grid (for small grids)
GAR 1 ☐ to show vertical text for answer headings
GAR 2 ☐ to show vertical text for answer headings on mobile devices only

Questionnaire Style (default is 7): Click here for details

Choose base format:	Choose variations:
Accis3 ☐	Question and answer fonts (full list: https://fonts.google.com/) ☐
Accis4 ☐	Header font ☐
Accis5 ☐	Tick box style (1-6) ☐
Accis6 ☐	Next/previous button style (1-3) ☐
Accis7 ☐	Font colour (use HEX code http://html-color-codes.info/#HTML_Color_Picker) # ☐
Accis8 ☐	

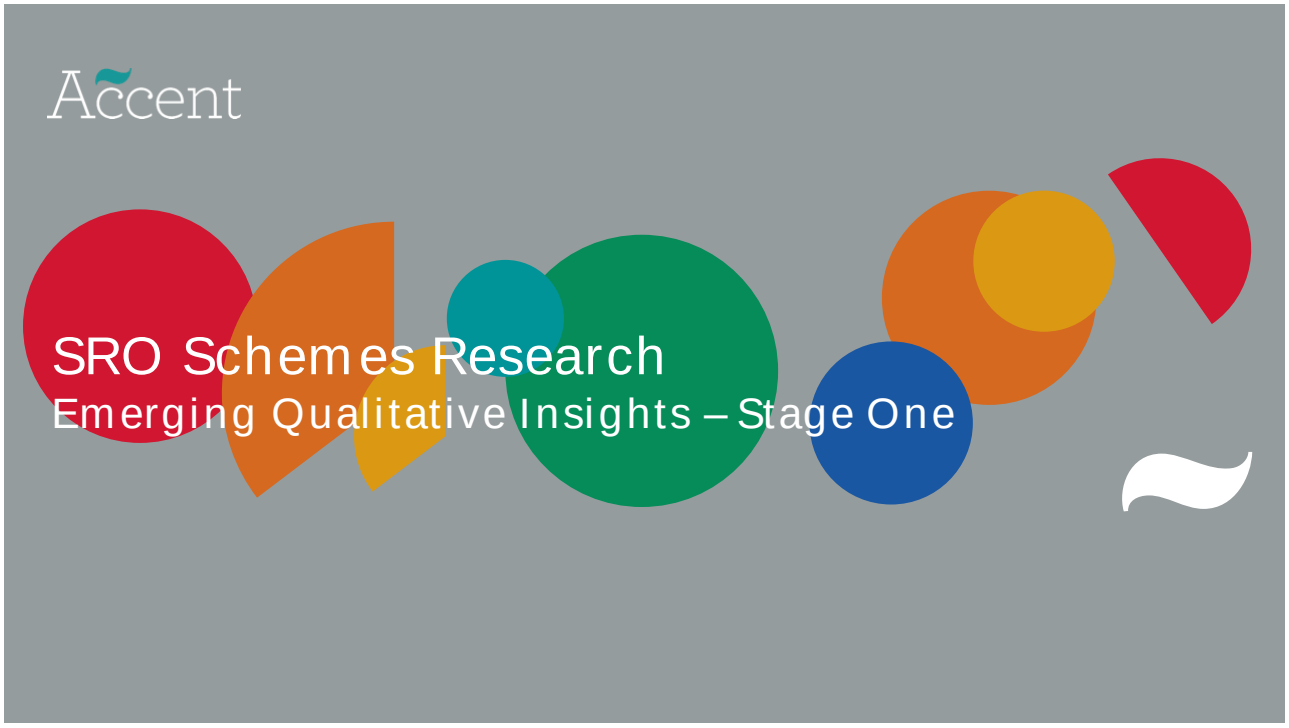
Other colours: Note that CLR1 and CLR6 change a number of different elements (to easily keep the colours consistent)

CLR1	# ☐	Progress bar border, progress colour, button colour
CLR2	# ☐	Progress bar background colour
CLR3	# ☐	Page background colour
CLR4	# ☐	Header background colour (if different from CLR1)
CLR5	# ☐	Header font colour
CLR6	# ☐	Border colour for selected checkbox and checkbox border colour when hovered over (if different from CLR1)
CLR7	# ☐	Background colour for selected checkbox (if different from CLR1)
CLR8		Tick/circle colour for selected checkbox

Appendix C

Phase 1: Qualitative Findings

Double click on image to open in Powerpoint:



Appendix D

Phase 2: Qualitative Insights

Double click on image to open in Powerpoint:

Appendix E

Phase 2: SP1 Econometric Modelling

Appendix E: SP1 Econometric Modelling

Overview

The data consist of ten choices per participant, each between two options. Each option includes up to three project additions and a bill impact, while the type of site and its distance from the participant are scenario-level features that do not vary across options in any given choice occasion.

The choices made by each participant were analysed via econometric discrete choice models, with *choice* as the dependent variable, a {1,0} variable indicating whether any given option was preferred over the alternative option in any given choice occasion. Choices are interpreted as indicating that the 'utility' of the preferred option is greater than the utility of the option that was not chosen. This interpretation follows the principles of random utility theory[12].

The valuations of interest may potentially differ across project additions, by type of site (reservoir, canal, water treatment works, pipeline), by distance of the site from any participant's home/organisation (5 vs 50 miles), and across companies. This would lead to a fully flexible model specification that would allow for 960 distinct WTP values:

- (26 attributes) × (2 distances) × (6 companies) for 'Reservoir' and
- (18 attributes)[13] × (2 distances) × (6 companies) for each of 'Canal', 'Water treatment works' and 'Pipeline.

However, in order to obtain reasonably precise estimates of WTP from a fully flexible specification a much larger sample would be needed. Our approach was to specify a fairly flexible 'general' model that imposes some restrictions on WTP values while allowing for differences in WTP by type of site, distance, and company. The general model was reduced by excluding insignificant coefficients in a stepwise procedure to obtain more precise value estimates.

Model Development: Household

Table 34 shows the three stages of model development: (1) the general model; (2) an intermediate model obtained via stepwise elimination of insignificant coefficients; (3) the final model, from which our WTP estimates are derived. The initial, general model in column (1) allows for differences in valuations:

- across companies via bill × company interactions
- by type of site via bill × site interactions and project-addition-specific terms

[12] See, e.g., Kenneth Train, *Discrete Choice Methods with Simulation* (Cambridge University Press, 2003).

[13] The following project additions were only available at 'Reservoir' sites: Shop selling sustainable products and gardening materials; Outdoor BBQ/picnic facilities; Water sports facilities, e.g. sailing, paddleboarding; Land-based recreation/amenities; Children's playground; Sensory garden/space for those with learning difficulties; Beach area; Campsite.

- by distance via bill × distance × site interactions and project-addition-specific terms.

The sign of the bill impact is negative as expected (across companies, site types, and site distances), and the value of the pseudo-R^2 statistic indicates a relatively good fit. However, many coefficients are far from being statistically significant. To obtain more precise estimates we sequentially removed the least significant project-addition-specific distance effects and project-addition-specific site effects[14]. The reduced model is shown in column (2). The final model in column (3) excludes a number of bill × company, bill × site, and bill × distance × site interaction terms that were individually and jointly insignificant in the intermediate model.

The final model fits the data reasonably well. The bill impact is negative and highly statistically significant across all combinations of company, site type, and site distance. The model yields higher WTP values for Thames Water, Cambridge Water, and Severn Trent Water, all else equal, but differences across companies are relatively small. The final model yields substantially more precise estimates than the initial, unrestricted model, while retaining a sufficient number of project-addition-specific site and distance effects to allow for variation in valuations. The model appears to be well-suited for the derivation of WTP values.

The WTP for any project addition was calculated as the bill increment (or, in a few instances, bill decrease) that would just offset the (usually) positive utility-impact of the provision of that project addition, i.e., as the negative of the ratio between the (sum of the) relevant project-addition coefficient(s) to the (sum of the) relevant bill coefficient(s). For example, Thames Water customers' annual WTP for 'Walking paths, Boardwalk, Bridleway, Cycle trail' along canals 5 miles from home is calculated as follows

$$\mathrm{WTP}_{\mathrm{att18,\ Canal,\ 50\ mi,\ Tha}} = -\frac{att18 + att18 \times Canal}{bill + bill \times Canal} = £2.36$$

Table 34: Model development stages: household

	(1)		(2)		(3)	
	General model		Intermediate model		Final model	
Variable	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
bill	-0.290 **	(0.018)	-0.300 **	(0.018)	-0.324 **	(0.013)
bill × Aff	-0.055 *	(0.022)	-0.055 *	(0.022)	-0.039 *	(0.019)
bill × Ang	-0.057 **	(0.021)	-0.058 **	(0.021)	-0.041 *	(0.018)
bill × Cam	-0.049	(0.032)	-0.049	(0.032)		
bill × Sev	-0.034	(0.021)	-0.034	(0.021)		
bill × Sou	-0.061 **	(0.022)	-0.061 **	(0.022)	-0.045 *	(0.019)
bill × Canal	-0.073 *	(0.031)	-0.047	(0.028)		
bill × Pipeline	-0.023	(0.036)	-0.008	(0.026)		
bill × WTW	0.124 *	(0.051)	0.091 **	(0.035)	0.102 **	(0.034)
bill × 50	-0.051 **	(0.017)	-0.043 **	(0.016)	-0.033 *	(0.014)
bill × 50 × Canal	0.073	(0.043)	0.054	(0.038)		
bill × 50 × Pipeline	0.012	(0.054)	0.013	(0.046)		
bill × 50 × WTW	-0.227 **	(0.064)	-0.214 **	(0.047)	-0.230 **	(0.046)
att1	0.558 **	(0.097)	0.501 **	(0.060)	0.502 **	(0.059)
att2	1.057 **	(0.123)	0.937 **	(0.079)	0.946 **	(0.078)
att3	-0.106	(0.106)	-0.125	(0.072)	-0.125	(0.072)

[14] We used joint significance tests for project-addition × site interactions, i.e., testing att5 x Canal = att5 x Pipeline = att5 x WTW = 0, for example.

	(1)		(2)		(3)	
	General model		Intermediate model		Final model	
Variable	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
att4	0.106	(0.087)	0.042	(0.063)	0.038	(0.063)
att5	0.806 **	(0.102)	0.783 **	(0.053)	0.799 **	(0.051)
att6	0.339 **	(0.084)	0.289 **	(0.058)	0.287 **	(0.058)
att7	0.370 **	(0.106)	0.286 **	(0.068)	0.281 **	(0.066)
att8	0.663 **	(0.099)	0.490 **	(0.066)	0.483 **	(0.066)
att9	0.125	(0.066)	0.146 **	(0.040)	0.148 **	(0.039)
att10	0.527 **	(0.113)	0.393 **	(0.071)	0.389 **	(0.071)
att11	0.405 **	(0.097)	0.441 **	(0.073)	0.446 **	(0.073)
att12	0.271 **	(0.099)	0.279 **	(0.067)	0.288 **	(0.067)
att13	0.144	(0.162)	0.354 **	(0.059)	0.361 **	(0.059)
att14	0.367 **	(0.095)	0.411 **	(0.060)	0.416 **	(0.060)
att15	0.789 **	(0.094)	0.750 **	(0.072)	0.746 **	(0.072)
att16	0.059	(0.101)	0.074	(0.076)	0.075	(0.076)
att17	0.369 **	(0.105)	0.359 **	(0.065)	0.367 **	(0.065)
att18	0.909 **	(0.095)	0.777 **	(0.059)	0.770 **	(0.059)
att19	0.898 **	(0.130)	0.814 **	(0.102)	0.818 **	(0.102)
att20	0.188	(0.102)	0.037	(0.052)	0.037	(0.051)
att21	-0.048	(0.107)	-0.191 **	(0.061)	-0.191 **	(0.060)
att22	0.353 **	(0.076)	0.275 **	(0.055)	0.277 **	(0.055)
att23	0.450 **	(0.088)	0.397 **	(0.048)	0.409 **	(0.046)
att24	0.697 **	(0.110)	0.632 **	(0.058)	0.624 **	(0.058)
att25	1.113 **	(0.104)	1.042 **	(0.073)	1.038 **	(0.072)
att26	0.852 **	(0.092)	0.865 **	(0.061)	0.868 **	(0.060)
att1 × 50	-0.046	(0.110)				
att2 × 50	-0.355 **	(0.129)	-0.263 **	(0.076)	-0.270 **	(0.076)
att3 × 50	0.388 **	(0.123)	0.332 **	(0.078)	0.336 **	(0.075)
att4 × 50	0.139	(0.110)	0.190 *	(0.075)	0.193 **	(0.074)
att5 × 50	-0.328 **	(0.112)	-0.269 **	(0.063)	-0.288 **	(0.062)
att6 × 50	0.346 **	(0.133)	0.449 **	(0.078)	0.469 **	(0.076)
att7 × 50	-0.067	(0.109)				
att8 × 50	0.126	(0.115)	0.241 **	(0.061)	0.247 **	(0.061)
att9 × 50	-0.006	(0.093)				
att10 × 50	-0.405 *	(0.175)	-0.337 **	(0.118)	-0.338 **	(0.116)
att11 × 50	-0.208	(0.127)	-0.307 **	(0.087)	-0.306 **	(0.087)
att12 × 50	-0.182	(0.123)	-0.225 **	(0.086)	-0.233 **	(0.087)
att13 × 50	0.267	(0.176)				
att14 × 50	0.142	(0.120)				
att15 × 50	-0.303 **	(0.108)	-0.307 **	(0.074)	-0.305 **	(0.073)
att16 × 50	0.229	(0.126)	0.220 *	(0.096)	0.220 *	(0.095)
att17 × 50	0.033	(0.147)				
att18 × 50	-0.392 **	(0.108)	-0.234 **	(0.062)	-0.237 **	(0.060)
att19 × 50	-0.433 **	(0.135)	-0.335 **	(0.108)	-0.340 **	(0.107)
att20 × 50	-0.183	(0.119)				
att21 × 50	-0.161	(0.115)				
att22 × 50	0.403 **	(0.105)	0.386 **	(0.077)	0.385 **	(0.077)
att23 × 50	0.021	(0.115)				
att24 × 50	-0.264 *	(0.122)	-0.189 **	(0.065)	-0.178 **	(0.063)
att25 × 50	-0.503 **	(0.110)	-0.408 **	(0.071)	-0.404 **	(0.070)
att26 × 50	0.021	(0.109)				
att1 × Canal	0.026	(0.157)	0.097	(0.089)	0.078	(0.085)
att2 × Canal	-0.123	(0.141)	-0.022	(0.089)	-0.011	(0.086)
att3 × Canal	0.265 *	(0.135)	0.276 **	(0.103)	0.268 **	(0.102)

	(1)		(2)		(3)	
	General model		Intermediate model		Final model	
Variable	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
att4 × Canal	0.218	(0.139)	0.287 **	(0.099)	0.302 **	(0.098)
att5 × Canal	0.010	(0.131)				
att6 × Canal	0.193	(0.155)	0.181	(0.112)	0.155	(0.105)
att7 × Canal	0.211	(0.128)	0.269 **	(0.091)	0.296 **	(0.088)
att8 × Canal	-0.146	(0.152)	-0.016	(0.085)	-0.029	(0.083)
att9 × Canal	0.002	(0.107)				
att14 × Canal	0.009	(0.113)	0.063	(0.082)	0.052	(0.079)
att15 × Canal	-0.329 **	(0.118)	-0.266 **	(0.083)	-0.271 **	(0.081)
att18 × Canal	-0.052	(0.154)				
att21 × Canal	0.334 *	(0.164)	0.366 **	(0.100)	0.340 **	(0.095)
att22 × Canal	-0.198	(0.140)				
att23 × Canal	-0.145	(0.147)				
att24 × Canal	-0.033	(0.127)				
att25 × Canal	-0.060	(0.126)	-0.053	(0.085)	-0.064	(0.083)
att26 × Canal	0.101	(0.149)	0.134	(0.094)	0.133	(0.092)
att1 × Pipeline	-0.480 **	(0.180)	-0.272 **	(0.102)	-0.272 **	(0.094)
att2 × Pipeline	-0.453 *	(0.191)	-0.166	(0.107)	-0.166	(0.106)
att3 × Pipeline	0.228	(0.213)	0.217	(0.130)	0.228 *	(0.108)
att4 × Pipeline	-0.276	(0.148)	-0.125	(0.106)	-0.126	(0.105)
att5 × Pipeline	-0.269	(0.179)				
att6 × Pipeline	-0.630 **	(0.137)	-0.492 **	(0.098)	-0.508 **	(0.095)
att7 × Pipeline	-0.287	(0.179)	-0.107	(0.097)	-0.097	(0.093)
att8 × Pipeline	-0.816 **	(0.154)	-0.570 **	(0.103)	-0.567 **	(0.094)
att9 × Pipeline	0.006	(0.147)				
att14 × Pipeline	-0.462 *	(0.207)	-0.302 **	(0.104)	-0.296 **	(0.099)
att15 × Pipeline	-0.340	(0.247)	0.047	(0.116)	0.039	(0.115)
att18 × Pipeline	-0.372	(0.190)				
att21 × Pipeline	-0.029	(0.145)	0.190 *	(0.086)	0.184 *	(0.085)
att22 × Pipeline	-0.182	(0.172)				
att23 × Pipeline	-0.315	(0.208)				
att24 × Pipeline	-0.334	(0.247)				
att25 × Pipeline	-0.537 **	(0.184)	-0.273 **	(0.092)	-0.263 **	(0.092)
att26 × Pipeline	-0.520 *	(0.217)	-0.289 *	(0.113)	-0.301 **	(0.113)
att1 × WTW	0.018	(0.233)	0.117	(0.144)	0.109	(0.142)
att2 × WTW	-0.678 **	(0.175)	-0.616 **	(0.135)	-0.625 **	(0.135)
att3 × WTW	-0.664 **	(0.195)	-0.347 *	(0.151)	-0.349 *	(0.152)
att4 × WTW	-0.123	(0.175)	-0.163	(0.132)	-0.161	(0.132)
att5 × WTW	0.000	(0.148)				
att6 × WTW	0.097	(0.150)	0.067	(0.102)	0.064	(0.101)
att7 × WTW	0.239	(0.185)	0.241 *	(0.117)	0.249 *	(0.116)
att8 × WTW	0.001	(0.140)	0.075	(0.104)	0.078	(0.105)
att9 × WTW	0.168	(0.142)				
att14 × WTW	-0.283	(0.186)	-0.224	(0.143)	-0.230	(0.143)
att15 × WTW	0.001	(0.158)	0.036	(0.093)	0.040	(0.093)
att18 × WTW	0.115	(0.150)				
att21 × WTW	0.979 **	(0.174)	0.940 **	(0.122)	0.957 **	(0.121)
att22 × WTW	0.107	(0.206)				
att23 × WTW	-0.218	(0.169)				
att24 × WTW	-0.222	(0.231)				
att25 × WTW	0.135	(0.154)	0.079	(0.111)	0.079	(0.111)
att26 × WTW	1.095 **	(0.184)	1.093 **	(0.118)	1.093 **	(0.118)

	(1)		(2)		(3)	
	General model		Intermediate model		Final model	
Variable	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
No. observations	118,040		118,040		118,040	
No. participants	5,902		5,902		5,902	
Pseudo R-squared	0.15		0.15		0.15	

Note: Conditional logit estimates on weighted data. Dependent variable: choice. Standard errors clustered by participant. ** $p < 0.01$, * $p < 0.05$. 'att1' to 'att26' are dummy variables marking project additions (see Table 1). 'bill' measures the bill impact. ' × ' denotes interaction terms. 'Aff', 'Ang', etc. are company dummies (base: Thames). '50' is a dummy variable indicating sites 50 miles away. 'Canal', 'Pipeline', and 'WTW' are dummy variables indicating the type of site.

Model Development: Non-Household

The modelling approach for non-households was largely the same as for households. Given that the non-household sample was relatively small, we chose not to include any bill × company and bill × distance × site interactions in the initial model. The same stepwise model reduction procedure was applied as for households. Unsurprisingly, given the considerably smaller sample size and poorer fit of the model, a greater number of project-addition-specific site and distance effects were excluded. In the final step, leading from the intermediate model in column (2) to the final model in column (3), all bill interaction terms, which were individually and jointly insignificant, were excluded.

The bill impact is negative and highly statistically significant in the final model, allowing estimation of WTP values. The final model also yields substantially more precise estimates than the initial, unrestricted model. However, as a consequence of a poorer fit to the data compared to the final household model and a smaller sample size, WTP estimates for project additions are less precise overall than for households.

Table 35: Model development stages: non-household

	(1)		(2)		(3)	
	General model		Intermediate model		Final model	
Variable	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
bill	-96.672 **	(13.882)	-93.059 **	(12.840)	-99.716 **	(9.052)
bill × Canal	-26.919	(28.956)	-24.195	(22.887)		
bill × Pipeline	10.621	(36.878)	-18.670	(21.443)		
bill × WTW	11.057	(35.619)	11.274	(21.139)		
bill × 50	-11.713	(15.501)	-3.479	(13.507)		
att1	0.584	(0.315)	0.196	(0.168)	0.212	(0.168)
att2	1.368 **	(0.432)	0.704 **	(0.141)	0.713 **	(0.138)
att3	0.738 *	(0.369)	0.509 **	(0.180)	0.538 **	(0.178)
att4	0.570	(0.309)	0.248	(0.128)	0.272 *	(0.127)
att5	1.006 **	(0.343)	0.556 **	(0.131)	0.600 **	(0.127)
att6	0.559 *	(0.277)	0.424 **	(0.124)	0.446 **	(0.121)
att7	0.830 *	(0.351)	0.615 **	(0.129)	0.633 **	(0.128)
att8	0.546	(0.312)	0.420 *	(0.178)	0.426 *	(0.181)
att9	0.288	(0.222)	0.091	(0.124)	0.108	(0.122)
att10	0.792	(0.421)	0.361	(0.195)	0.379	(0.195)
att11	0.677 *	(0.306)	0.384	(0.224)	0.393	(0.224)
att12	0.980 **	(0.344)	0.572 **	(0.210)	0.597 **	(0.211)
att13	0.953	(0.566)	0.461 **	(0.141)	0.470 **	(0.138)
att14	0.499	(0.293)	0.425 **	(0.133)	0.435 **	(0.132)
att15	0.889 **	(0.303)	0.578 **	(0.124)	0.593 **	(0.123)

	(1)		(2)		(3)	
	General model		Intermediate model		Final model	
Variable	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
att16	0.139	(0.326)	0.051	(0.165)	0.070	(0.165)
att17	1.092 **	(0.360)	0.910 **	(0.169)	0.932 **	(0.167)
att18	0.809 *	(0.317)	0.448 **	(0.155)	0.469 **	(0.154)
att19	1.334 **	(0.447)	0.956 **	(0.290)	0.975 **	(0.289)
att20	0.231	(0.356)	0.114	(0.156)	0.132	(0.154)
att21	0.117	(0.349)	-0.179	(0.173)	-0.156	(0.171)
att22	0.381	(0.249)	0.207	(0.155)	0.198	(0.153)
att23	0.689 *	(0.274)	0.386 **	(0.130)	0.406 **	(0.126)
att24	0.900 *	(0.369)	0.588 **	(0.127)	0.605 **	(0.126)
att25	0.807 *	(0.355)	0.690 **	(0.138)	0.708 **	(0.136)
att26	0.832 **	(0.301)	0.637 **	(0.184)	0.659 **	(0.183)
att1 × 50	-0.508	(0.357)				
att2 × 50	-0.564	(0.421)				
att3 × 50	-0.140	(0.396)				
att4 × 50	0.055	(0.385)				
att5 × 50	-0.513	(0.336)				
att6 × 50	-0.128	(0.417)				
att7 × 50	-0.064	(0.359)				
att8 × 50	0.429	(0.363)	0.626 **	(0.179)	0.621 **	(0.181)
att9 × 50	0.142	(0.314)				
att10 × 50	-0.999	(0.601)				
att11 × 50	-0.732	(0.396)	-0.508 *	(0.250)	-0.513 *	(0.249)
att12 × 50	-0.918 *	(0.412)	-0.569 *	(0.262)	-0.580 *	(0.262)
att13 × 50	-0.542	(0.638)				
att14 × 50	0.225	(0.376)				
att15 × 50	-0.261	(0.355)				
att16 × 50	0.095	(0.412)				
att17 × 50	-0.103	(0.474)				
att18 × 50	-0.533	(0.381)				
att19 × 50	-1.153 **	(0.427)	-0.750 **	(0.275)	-0.756 **	(0.276)
att20 × 50	0.128	(0.416)				
att21 × 50	-0.311	(0.357)				
att22 × 50	0.305	(0.365)	0.531 *	(0.212)	0.553 **	(0.210)
att23 × 50	-0.206	(0.359)				
att24 × 50	-0.596	(0.391)				
att25 × 50	0.020	(0.359)				
att26 × 50	-0.155	(0.341)				
att1 × Canal	-0.638	(0.536)	-0.166	(0.273)	-0.161	(0.269)
att2 × Canal	-0.741	(0.502)				
att3 × Canal	-0.116	(0.442)	-0.033	(0.262)	-0.063	(0.258)
att4 × Canal	-0.358	(0.462)				
att5 × Canal	-0.256	(0.462)				
att6 × Canal	0.260	(0.478)				
att7 × Canal	0.083	(0.416)				
att8 × Canal	-0.941	(0.501)	-0.775 **	(0.250)	-0.744 **	(0.248)
att9 × Canal	-0.353	(0.355)				
att14 × Canal	0.033	(0.369)				
att15 × Canal	-0.564	(0.391)				
att18 × Canal	-0.979	(0.524)	-0.506 **	(0.179)	-0.461 **	(0.176)
att21 × Canal	-0.291	(0.521)	-0.236	(0.241)	-0.238	(0.238)
att22 × Canal	-0.230	(0.470)				
att23 × Canal	-0.145	(0.457)				

	(1)		(2)		(3)	
	General model		Intermediate model		Final model	
Variable	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
att24 × Canal	-0.149	(0.410)				
att25 × Canal	-0.196	(0.404)				
att26 × Canal	-0.621	(0.471)	-0.546 *	(0.247)	-0.544 *	(0.243)
att1 × Pipeline	-0.049	(0.568)	0.456	(0.262)	0.479	(0.258)
att2 × Pipeline	-0.894	(0.633)				
att3 × Pipeline	-0.263	(0.639)	0.280	(0.321)	0.200	(0.290)
att4 × Pipeline	-0.702	(0.465)				
att5 × Pipeline	-1.300 *	(0.580)				
att6 × Pipeline	-0.769	(0.425)				
att7 × Pipeline	-0.765	(0.559)				
att8 × Pipeline	-1.446 **	(0.454)	-0.525 *	(0.228)	-0.484 *	(0.224)
att9 × Pipeline	-0.818	(0.483)				
att14 × Pipeline	-0.302	(0.646)				
att15 × Pipeline	0.074	(0.816)				
att18 × Pipeline	-1.208 *	(0.603)	-0.011	(0.178)	-0.007	(0.178)
att21 × Pipeline	-0.548	(0.486)	0.370	(0.259)	0.346	(0.258)
att22 × Pipeline	-0.033	(0.508)				
att23 × Pipeline	-0.106	(0.678)				
att24 × Pipeline	-0.953	(0.776)				
att25 × Pipeline	-0.412	(0.562)				
att26 × Pipeline	-0.038	(0.721)	0.182	(0.278)	0.177	(0.271)
att1 × WTW	0.490	(0.694)	0.696 *	(0.321)	0.763 *	(0.319)
att2 × WTW	-0.719	(0.546)				
att3 × WTW	-1.750 **	(0.570)	-0.866 *	(0.349)	-0.799 *	(0.339)
att4 × WTW	-0.132	(0.568)				
att5 × WTW	-0.249	(0.458)				
att6 × WTW	0.045	(0.456)				
att7 × WTW	-0.435	(0.569)				
att8 × WTW	0.189	(0.465)	-0.066	(0.278)	-0.059	(0.282)
att9 × WTW	-0.034	(0.471)				
att14 × WTW	-0.655	(0.576)				
att15 × WTW	-0.025	(0.507)				
att18 × WTW	0.936	(0.501)	0.233	(0.219)	0.238	(0.221)
att21 × WTW	0.993 *	(0.486)	0.647 *	(0.320)	0.632	(0.324)
att22 × WTW	0.666	(0.698)				
att23 × WTW	-1.050 *	(0.432)				
att24 × WTW	-0.231	(0.697)				
att25 × WTW	0.185	(0.497)				
att26 × WTW	0.916	(0.498)	0.646 *	(0.270)	0.651 *	(0.271)
No. observations	11,060		11,060		11,060	
No. participants	553		553		553	
Pseudo R-squared	0.10		0.09		0.09	

Note: Conditional logit estimates on weighted data. Dependent variable: choice. Standard errors clustered by participant. ** $p < 0.01$, * $p < 0.05$. 'att1' to 'att26' are dummy variables marking project additions (see Table 1). 'bill' measures the bill impact. ' × ' denotes interaction terms. '50' is a dummy variable indicating sites 50 miles away. 'Canal', 'Pipeline', and 'WTW' are dummy variables indicating the type of site.

Appendix F

Aggregate Valuations

Appendix F Aggregated Valuations

Table 36: Aggregated valuations: Fens Reservoir

Att.	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
Affinity Water										
1	-	-	-	-	-	-	10,876	32,596	45,480	88,211
2	-	-	-	-	-	-	16,719	48,088	64,216	118,855
3	-	-	-	-	-	-	1,998	8,501	15,440	37,028
4	-	-	-	-	-	-	3,529	12,025	18,841	40,626
5	-	-	-	-	-	-	13,277	37,636	49,440	89,813
6	-	-	-	-	-	-	12,781	41,820	63,350	132,769
7	-	-	-	-	-	-	6,080	18,224	25,428	49,318
8	-	-	-	-	-	-	13,930	43,601	63,468	128,313
9	-	-	-	-	-	-	3,201	9,594	13,387	25,964
10	-	-	-	-	-	-	3,687	8,516	8,275	8,910
11	-	-	-	-	-	-	5,360	13,770	15,947	24,463
12	-	-	-	-	-	-	2,970	7,157	7,504	9,643
13	-	-	-	-	-	-	7,812	23,415	32,670	63,366
14	-	-	-	-	-	-	9,013	27,013	37,690	73,101
15	-	-	-	-	-	-	11,899	33,381	43,326	77,604
16	-	-	-	-	-	-	4,690	15,703	24,250	51,669
17	-	-	-	-	-	-	7,945	23,812	33,224	64,441
18	-	-	-	-	-	-	13,345	38,218	50,791	93,499
19	-	-	-	-	-	-	12,950	36,270	46,982	83,954
20	-	-	-	-	-	-	807	2,418	3,374	6,544
21	-	-	-	-	-	-	- 4,142	-12,413	-17,320	-33,592
22	-	-	-	-	-	-	11,384	37,005	55,737	116,230
23	-	-	-	-	-	-	8,860	26,554	37,050	71,861
24	-	-	-	-	-	-	11,026	31,713	42,347	78,375
25	-	-	-	-	-	-	16,827	47,412	61,849	111,443
26	-	-	-	-	-	-	18,806	56,366	78,645	152,537
Anglian Water										
1	97,446	88,591	261,929	233,694	175,606	179,365	210,054	349,244	484,558	243,460
2	183,687	162,103	464,531	401,049	291,093	286,629	322,900	515,207	684,168	328,035
3	-24,226	- 15,941	-28,803	-9,031	5,981	19,404	38,602	91,106	164,515	102,196
4	7,332	10,173	40,645	45,872	41,830	50,390	68,165	128,855	200,749	112,127
5	155,122	135,805	385,787	329,893	236,935	230,594	256,419	403,220	526,734	247,880
6	55,646	59,092	200,327	202,026	169,652	191,863	246,881	448,103	674,980	366,439
7	54,481	49,531	146,443	130,657	98,181	100,282	117,440	195,261	270,914	136,117
8	93,807	89,761	278,879	261,085	205,586	219,772	269,062	467,171	676,226	354,142
9	28,682	26,076	77,097	68,786	51,688	52,795	61,828	102,797	142,626	71,661
10	75,510	62,515	166,351	131,615	86,028	74,464	71,196	91,226	88,148	24,590
11	86,490	73,076	199,323	162,619	110,541	100,769	103,514	147,523	169,885	67,518
12	55,832	46,539	124,881	99,858	66,181	58,375	57,349	76,673	79,943	26,614
13	69,999	63,639	188,155	167,872	126,145	128,845	150,891	250,877	348,078	174,887
14	80,753	73,416	217,062	193,663	145,526	148,640	174,073	289,420	401,556	201,757
15	144,858	126,172	356,401	302,851	215,982	208,535	229,801	357,631	461,596	214,186
16	14,461	17,128	62,634	66,788	58,541	68,493	90,602	168,256	258,383	142,605
17	71,187	64,718	191,346	170,720	128,285	131,031	153,451	255,133	353,983	177,854
18	149,386	131,506	375,838	323,528	234,074	229,674	257,733	409,459	541,130	258,055
19	158,693	138,113	389,785	330,891	235,716	227,299	250,113	388,583	500,549	231,711
20	7,230	6,573	19,433	17,338	13,028	13,307	15,584	25,911	35,950	18,062
21	-37,109	-33,737	-99,747	-88,995	-66,874	-68,305	-79,993	-132,999	-184,529	-92,714
22	53,672	55,775	185,934	185,014	153,674	172,216	219,899	396,504	593,853	320,790
23	79,384	72,171	213,381	190,380	143,058	146,120	171,122	284,513	394,748	198,336
24	121,165	106,925	306,401	264,521	191,991	189,041	212,955	339,768	451,174	216,312

Att.	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
25	201,438	175,818	497,780	424,077	303,313	293,815	324,993	507,963	658,941	307,580
26	168,506	153,195	452,937	404,112	303,664	310,163	363,233	603,924	837,913	420,998
Severn Trent Water										
1	-	-	-	-	-	-	1.3	5,638	12,554	29,242
2	-	-	-	-	-	-	2.0	8,323	17,733	39,401
3	-	-	-	-	-	-	0.2	1,464	4,253	12,275
4	-	-	-	-	-	-	0.4	2,076	5,196	13,468
5	-	-	-	-	-	-	1.6	6,516	13,655	29,773
6	-	-	-	-	-	-	1.5	7,224	17,475	44,013
7	-	-	-	-	-	-	0.7	3,152	7,019	16,349
8	-	-	-	-	-	-	1.6	7,536	17,513	42,536
9	-	-	-	-	-	-	0.4	1,660	3,695	8,607
10	-	-	-	-	-	-	0.4	1,480	2,293	2,954
11	-	-	-	-	-	-	0.6	2,388	4,410	8,110
12	-	-	-	-	-	-	0.4	1,243	2,078	3,197
13	-	-	-	-	-	-	0.9	4,050	9,018	21,006
14	-	-	-	-	-	-	1.1	4,672	10,404	24,233
15	-	-	-	-	-	-	1.4	5,780	11,968	25,726
16	-	-	-	-	-	-	0.6	2,711	6,688	17,128
17	-	-	-	-	-	-	0.9	4,119	9,171	21,362
18	-	-	-	-	-	-	1.6	6,615	14,027	30,995
19	-	-	-	-	-	-	1.5	6,280	12,978	27,831
20	-	-	-	-	-	-	0.1	418	931	2,169
21	-	-	-	-	-	-	-0.5	-2,147	-4,781	-11,136
22	-	-	-	-	-	-	1.3	6,393	15,375	38,530
23	-	-	-	-	-	-	1.0	4,593	10,227	23,822
24	-	-	-	-	-	-	1.3	5,489	11,694	25,981
25	-	-	-	-	-	-	2.0	8,209	17,084	36,944
26	-	-	-	-	-	-	2.2	9,749	21,709	50,566
South Staffordshire										
1	38,675	54,358	42,754	187,215	76,853	35,778	34,409	4,310	14	-
2	72,903	99,461	75,820	321,265	127,386	57,170	52,891	6,358	20	-
3	-9,615	-9,778	-4,697	-7,211	2,628	3,876	6,328	1,125	5	-
4	2,910	6,244	6,637	36,762	18,313	10,054	11,169	1,591	6	-
5	61,566	83,325	62,967	264,260	103,684	45,992	42,000	4,976	15	-
6	22,085	36,262	32,704	161,877	74,262	38,278	40,448	5,531	19	-
7	21,623	30,391	23,903	104,671	42,968	20,003	19,238	2,410	8	-
8	37,231	55,078	45,523	209,174	89,981	43,842	44,078	5,766	19	-
9	11,384	16,000	12,584	55,105	22,621	10,531	10,128	1,269	4	-
10	29,969	38,355	27,149	105,414	37,639	14,848	11,658	1,125	3	-
11	34,327	44,835	32,531	130,253	48,367	20,096	16,952	1,820	5	-
12	22,159	28,553	20,381	79,981	28,956	11,640	9,391	946	2	-
13	27,782	39,048	30,712	134,484	55,207	25,701	24,717	3,096	10	-
14	32,050	45,047	35,430	155,145	63,688	29,649	28,515	3,572	12	-
15	57,492	77,414	58,170	242,595	94,513	41,592	37,640	4,413	13	-
16	5,739	10,511	10,226	53,520	25,627	13,666	14,844	2,077	7	-
17	28,253	39,710	31,233	136,765	56,143	26,137	25,137	3,149	10	-
18	59,289	80,687	61,344	259,163	102,433	45,809	42,216	5,053	16	-
19	62,983	84,740	63,619	265,055	103,148	45,334	40,966	4,795	14	-
20	2,869	4,033	3,172	13,890	5,702	2,654	2,553	320	1	-
21	-14,728	-20,700	-16,281	-71,295	-29,267	-13,625	-13,104	-1,641	-5	-
22	21,302	34,226	30,354	148,243	67,267	34,358	36,027	4,894	17	-
23	31,507	44,283	34,830	152,515	62,609	29,147	28,031	3,511	11	-
24	48,089	65,605	50,010	211,897	84,018	37,705	34,882	4,193	13	-
25	79,948	107,875	81,246	339,703	132,730	58,601	53,232	6,269	19	-

Att.	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
26	66,878	93,997	73,931	323,737	132,896	61,868	59,501	7,453	24	-

Table 37: Aggregated valuations: South Lincolnshire Reservoir

Att.	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
Anglian Water										
1	19,196	49,369	33,463	153,990	95,063	96,681	152,123	117,449	139,562	151,260
2	36,184	90,334	59,347	264,266	157,581	154,498	233,846	173,261	197,053	203,806
3	-4,772	-8,884	-3,680	-5,951	3,238	10,459	27,956	30,639	47,384	63,494
4	1,444	5,669	5,193	30,227	22,644	27,161	49,365	43,333	57,820	69,664
5	30,557	75,679	49,287	217,379	128,263	124,294	185,700	135,601	151,709	154,006
6	10,962	32,930	25,593	133,122	91,840	103,418	178,793	150,694	194,407	227,667
7	10,732	27,602	18,709	86,095	53,149	54,054	85,051	65,665	78,028	84,569
8	18,479	50,021	35,629	172,039	111,292	118,461	194,856	157,107	194,766	220,026
9	5,650	14,531	9,850	45,326	27,981	28,457	44,776	34,570	41,079	44,522
10	14,875	34,837	21,252	86,726	46,570	40,137	51,561	30,679	25,388	15,278
11	17,038	40,723	25,465	107,156	59,841	54,316	74,965	49,611	48,930	41,949
12	10,998	25,934	15,954	65,800	35,826	31,465	41,532	25,785	23,025	16,535
13	13,789	35,464	24,038	110,617	68,288	69,450	109,276	84,368	100,253	108,657
14	15,908	40,912	27,731	127,612	78,779	80,120	126,065	97,330	115,656	125,350
15	28,535	70,311	45,532	199,560	116,921	112,404	166,423	120,269	132,948	133,072
16	2,849	9,545	8,002	44,009	31,691	36,919	65,614	56,583	74,419	88,600
17	14,023	36,065	24,446	112,494	69,446	70,628	111,130	85,800	101,954	110,500
18	29,427	73,284	48,016	213,184	126,714	123,798	186,652	137,699	155,856	160,328
19	31,261	76,966	49,798	218,037	127,603	122,518	181,133	130,678	144,168	143,961
20	1,424	3,663	2,483	11,425	7,053	7,173	11,286	8,714	10,354	11,222
21	-7,310	-18,801	-12,743	-58,642	-36,202	-36,818	-57,931	-44,727	-53,148	-57,603
22	10,573	31,081	23,754	121,912	83,190	92,828	159,252	133,342	171,041	199,305
23	15,638	40,218	27,261	125,448	77,444	78,761	123,927	95,680	113,695	123,225
24	23,868	59,585	39,145	174,303	103,933	101,896	154,223	114,262	129,947	134,393
25	39,681	97,977	63,594	279,440	164,196	158,372	235,361	170,825	189,787	191,098
26	33,194	85,370	57,866	266,284	164,386	167,184	263,055	203,096	241,335	261,564

Table 38: Aggregated valuations: Grand Union Canal

Att.	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
Affinity Water										
1	448,203	75,825	226,554	454,633	451,717	435,838	858,644	893,743	466,899	209,177
2	722,992	118,687	343,582	666,899	639,751	594,762	1,126,532	1,124,582	561,907	240,046
3	110,968	23,280	83,279	195,189	222,369	242,524	533,999	615,501	353,348	172,846
4	262,578	47,020	148,399	313,979	328,356	332,939	688,323	750,860	410,591	192,333
5	617,788	100,646	288,936	555,723	527,753	485,190	907,628	893,507	439,474	184,409
6	341,163	64,015	210,445	461,535	498,310	519,886	1,102,772	1,231,246	687,663	328,404
7	445,531	75,373	225,203	451,922	449,024	433,239	853,524	888,414	464,115	207,930
8	351,058	62,707	197,462	416,913	435,166	440,457	909,112	990,195	540,696	252,942
9	114,230	19,325	57,740	115,869	115,126	111,079	218,836	227,781	118,995	53,311
14	361,450	61,148	182,703	366,635	364,283	351,478	692,446	720,752	376,526	168,689
15	367,470	58,075	161,062	297,725	270,003	235,117	412,180	374,854	166,952	61,596
18	594,944	97,460	281,483	544,995	521,375	483,249	912,269	907,324	451,482	191,979
21	115,226	19,493	58,243	116,879	116,129	112,047	220,744	229,767	120,032	53,776
22	213,753	41,332	139,240	311,621	342,243	362,306	778,260	878,538	495,446	238,650
23	316,155	53,485	159,807	320,691	318,634	307,432	605,672	630,430	329,342	147,550
24	482,550	79,242	229,478	445,595	427,639	397,753	753,768	752,893	376,428	160,924
25	752,953	121,961	347,898	664,382	625,927	570,284	1,055,925	1,027,324	498,432	205,817
26	773,911	130,926	391,190	785,013	779,978	752,559	1,482,617	1,543,223	806,192	361,186
Anglian Water										
1	703,850	319,605	236,191	242,615	279,351	261,672	104,126	122,513	23,374	64,285

Att.	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
2	1,135,381	500,268	358,191	355,882	395,623	357,076	136,608	154,152	28,130	73,772
3	174,263	98,134	86,833	104,178	137,537	145,628	64,764	84,378	17,690	53,120
4	412,349	198,196	154,719	167,564	203,074	199,904	83,475	102,930	20,556	59,108
5	970,167	424,221	301,219	296,551	326,359	291,288	110,061	122,476	22,001	56,673
6	535,760	269,838	219,414	246,320	308,193	312,160	133,741	168,786	34,427	100,926
7	699,657	317,701	234,784	241,170	277,687	260,113	103,505	121,783	23,235	63,902
8	551,299	264,322	205,871	222,498	269,131	264,460	110,252	135,740	27,069	77,735
9	179,386	81,456	60,197	61,834	71,196	66,691	26,538	31,224	5,957	16,384
14	567,617	257,744	190,476	195,656	225,282	211,024	83,972	98,800	18,850	51,842
15	577,071	244,783	167,905	158,869	166,960	141,146	49,979	51,379	8,357	18,930
18	934,294	410,794	293,452	290,829	322,418	290,126	110,625	124,371	22,602	59,000
21	180,950	82,166	60,721	62,373	71,817	67,272	26,769	31,496	6,009	16,527
22	335,675	174,228	145,176	166,314	211,673	217,546	94,386	120,436	24,804	73,343
23	496,487	225,445	166,607	171,138	197,051	184,581	73,449	86,419	16,488	45,346
24	757,792	334,007	239,235	237,786	264,453	238,798	91,405	103,203	18,845	49,456
25	1,182,427	514,062	362,686	354,532	387,065	342,371	128,042	140,817	24,952	63,252
26	1,215,340	551,863	407,832	418,925	482,357	451,830	179,795	211,543	40,360	111,001
Severn Trent Water										
1	1,010,396	1,119,394	1,084,320	777,154	1,033,686	1,246,832	605,654	692,576	511,519	877,765
2	1,629,861	1,752,650	1,645,270	1,140,790	1,465,161	1,702,938	795,265	872,051	615,864	1,007,302
3	250,157	343,077	397,551	332,683	507,388	691,996	375,854	476,229	386,802	725,312
4	591,933	693,799	709,661	536,155	750,544	951,416	485,049	581,430	449,648	807,084
5	1,392,697	1,486,341	1,383,783	950,797	1,208,949	1,389,576	640,902	693,027	481,748	773,835
6	769,092	944,205	1,005,773	787,590	1,138,254	1,484,744	776,724	953,089	752,941	1,378,080
7	1,004,370	1,112,718	1,077,853	772,519	1,027,522	1,239,396	602,042	688,446	508,469	872,531
8	791,400	925,304	944,319	711,958	994,732	1,258,718	640,659	766,782	592,140	1,061,422
9	257,512	285,291	276,352	198,067	263,448	317,771	154,359	176,512	130,367	223,710
14	814,826	902,727	874,442	626,730	833,609	1,005,498	488,425	558,523	412,511	707,867
15	828,397	857,904	771,809	509,821	619,199	674,263	291,471	291,149	183,196	258,474
18	1,341,197	1,439,214	1,347,955	932,310	1,194,131	1,383,747	644,052	703,621	494,854	805,595
21	259,757	287,779	278,762	199,794	265,745	320,541	155,704	178,051	131,504	225,660
22	481,868	609,497	665,232	531,569	781,484	1,034,393	548,026	679,950	542,431	1,001,441
23	712,718	789,604	764,863	548,192	729,147	879,496	427,219	488,533	360,818	619,162
24	1,087,824	1,170,164	1,098,865	762,223	979,371	1,138,844	532,110	583,822	412,573	675,284
25	1,697,400	1,801,217	1,666,340	1,136,874	1,434,110	1,633,630	745,781	796,974	546,447	863,666
26	1,744,642	1,932,850	1,872,289	1,341,908	1,784,862	2,152,900	1,045,781	1,195,871	883,241	1,515,638
South Staffordshire Water										
1	47,659	213,099	153,092	671,980	544,193	357,050	80,063	32,194	37,803	57,482
2	76,879	333,549	232,158	985,636	770,641	487,191	105,030	40,505	45,493	65,965
3	11,800	65,441	56,295	288,617	267,998	198,753	49,806	22,176	28,613	47,499
4	27,921	132,154	100,291	464,149	395,638	272,793	64,190	27,050	33,246	52,854
5	65,692	282,844	195,230	821,303	635,708	397,422	84,618	32,181	35,580	50,676
6	36,277	179,930	142,235	682,341	600,471	426,002	102,846	44,357	55,682	90,246
7	47,375	211,829	152,180	667,974	540,949	354,922	79,585	32,002	37,578	57,140
8	37,329	176,245	133,448	616,310	524,330	360,886	84,779	35,672	43,781	69,509
9	12,147	54,311	39,018	171,263	138,695	90,999	20,405	8,205	9,635	14,650
14	38,434	171,852	123,460	541,913	438,860	287,941	64,566	25,962	30,486	46,356
15	39,075	163,203	108,819	439,960	325,187	192,553	38,420	13,499	13,515	16,927
18	63,263	273,892	190,197	805,462	628,040	395,842	85,053	32,680	36,553	52,756
21	12,252	54,785	39,358	172,756	139,904	91,792	20,583	8,277	9,719	14,778
22	22,729	116,179	94,113	460,728	412,427	296,890	72,584	31,651	40,118	65,581
23	33,618	150,318	107,989	474,006	383,867	251,859	56,475	22,709	26,666	40,547
24	51,311	222,696	155,058	658,562	515,132	325,814	70,276	27,118	30,477	44,222
25	80,064	342,743	235,066	981,868	753,943	467,109	98,441	37,000	40,353	56,559
26	82,293	367,958	264,344	1,160,305	939,656	616,518	138,244	55,589	65,275	99,255

Att.	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
Severn Trent Water										
1	-	7,208	162,489	44,496	61,423	268,440	365,641	1,097,650	2,935,558	2,916,565
2	-	11,286	246,549	65,316	87,062	366,639	480,112	1,382,095	3,534,384	3,346,980
3	-	2,209	59,574	19,048	30,150	148,985	226,908	754,765	2,219,815	2,410,005
4	-	4,468	106,345	30,697	44,599	204,838	292,831	921,497	2,580,483	2,681,709
5	-	9,571	207,364	54,438	71,838	299,173	386,921	1,098,365	2,764,704	2,571,233
6	-	6,080	150,718	45,093	67,637	319,662	468,918	1,510,531	4,321,053	4,578,967
7	-	7,165	161,520	44,230	61,057	266,839	363,461	1,091,105	2,918,054	2,899,174
8	-	5,958	141,509	40,763	59,109	270,999	386,774	1,215,257	3,398,230	3,526,803
9	-	1,837	41,412	11,340	15,655	68,415	93,188	279,750	748,166	743,325
14	-	5,813	131,038	35,883	49,535	216,482	294,869	885,192	2,367,359	2,352,042
15	-	5,524	115,658	29,190	36,794	145,167	175,965	461,436	1,051,341	858,834
18	-	9,268	201,995	53,379	70,957	297,918	388,823	1,115,155	2,839,917	2,676,764
21	-	1,853	41,773	11,439	15,791	69,012	94,001	282,189	754,688	749,805
22	-	3,925	99,687	30,435	46,437	222,703	330,850	1,077,639	3,112,958	3,327,503
23	-	5,085	114,617	31,387	43,327	189,354	257,918	774,265	2,070,697	2,057,299
24	-	7,535	164,668	43,641	58,196	245,191	321,242	925,287	2,367,715	2,243,777
25	-	11,599	249,706	65,092	85,217	351,717	450,238	1,263,108	3,136,006	2,869,716
26	-	12,446	280,568	76,831	106,060	463,515	631,352	1,895,311	5,068,828	5,036,035

Britainthinks

Insight & Strategy

Water Club: Changes of Source

Full report

June 2022

Contents

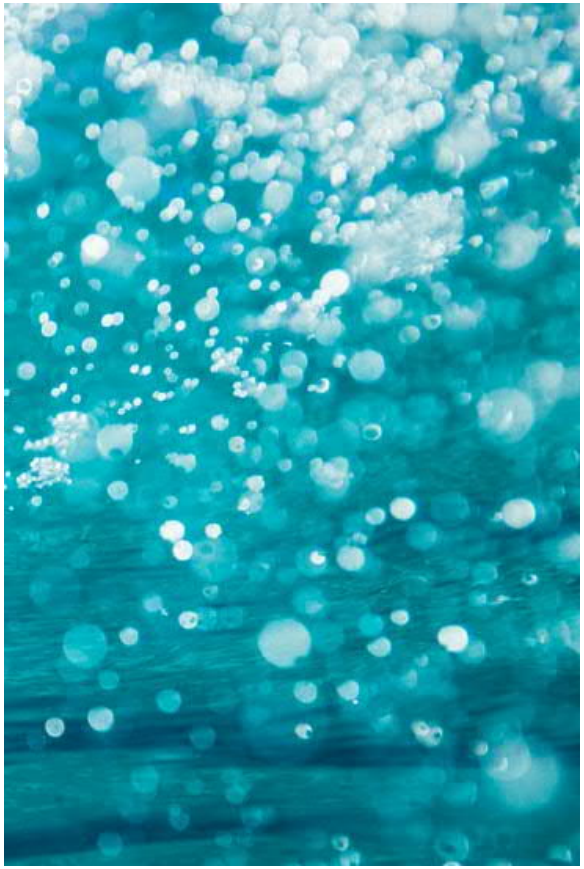
Guide to reading this report

This document is a **full technical report of research findings** from the Water Club: Changes of Source research.

The water companies involved in commissioning this research are: Anglian, Affinity, Cambridge, Southern, Thames and Severn Trent.

It is accompanied by a Communications Framework, which is an interactive document that can be used by communications teams as part of their development process. This includes directional recommendations on do's and don't's when communicating specific source changes, based on the findings included in this full research report, as well as interactive activities and stimuli for workshops.

Also available is a separate summary note that provides an overview of the key findings included in this report.



1 Background and methodology

Background

Changing the source of the water customers receive through their taps, whether through geographical redistribution, development of new sources, or recycling, is a key tool for water companies in the water stressed South East region to balance supply and demand in the most sustainable and efficient way for customers.

In order to make optimum use of the RAPID framework, water companies considering Strategic Resource Options to address long-term water resource challenges water companies need to have confidence that they understand how customers interpret and respond to the different water source changes that may form part of the South East water network in future.

Objectives

While most water companies have engaged customers on one or more water source changes in the context of Price Reviews or Water Resource Management Plans there is to date no comprehensive synthesis of evidence on which companies can base their future customer communications and plans.

This research for the Water Club, therefore, sought to:

- Review existing evidence.
- Identify and fill knowledge gaps about attitudes towards water source change.
- Provide a clear and actionable framework for water companies to use when communicating water source changes in future.

Methodology overview

This report has been developed based on three stages of research, focused on understanding customer attitudes towards water source changes and the implications for communications:

Evidence review

Including scoping interviews with each water company in the consortium and a rapid evidence review of relevant data

Qualitative research phase

96 household customers across the 6 companies, including Gen Z and vulnerable customers

STRAND A	STRAND B
Product testing session with water samples	Deliberative session on water sources
Deliberative session on water sources	Product testing session with water samples

Communications sessions: strands A&B mixed

Quantitative research phase

15-minute online survey with 1,762 household and 198 non-household customers for robust segmentation and validation of findings

Methodology in detail

Evidence review

- An evidence review of 50 documents and stakeholder interviews with each of the water companies.
- Evidence was included in the review based on the following criteria:
  - Publication date (prioritising data published since 2018).
  - Topic (focusing on customer attitudes towards and experiences of water source change).
- The majority of documents were gathered directly from the 6 water companies and included research commissioned by the companies and regulatory bodies, as well as academic research (sourced via water companies or Google Scholar).
- Each of the documents was reviewed and key findings were captured in an evidence grid, allowing for systematic selection of the most relevant evidence.
- The evidence was then synthesised to identify consistent findings (which were triangulated to assess their strength / wider verification), as well as areas of limited evidence.

In this report, data that is sourced from the evidence review is denoted with the following icon:

Methodology in detail

Qualitative research phase

We conducted in-person workshops with participants in the following locations in early 2022:

	Household customers		Non-household customers
Strand A: *These workshops started with the Deliberative Session, followed by the Product Testing*	**London** **19th February** 8 x informed customers; 8 x youth customers; 16 x general public; 4 x vulnerable	**Norwich** **26th February** 22 x general public; 2 x vulnerable	**London** **22nd February** 6 x small businesses; 6 x medium businesses
Strand B: *These workshops started with the Product Testing, followed by the Deliberative Session*	**Peterborough** **5th March** 8 x youth; 14 x general public; 2 x vulnerable	**Southampton** **26th February** 20 x general public; 4 x vulnerable	**Peterborough** **10th March** 6 x small businesses; 2 x medium businesses

We then brought all participants together for a two hour 'communication workshop', which was held on Zoom on 16th March.

Methodology in detail

Qualitative research phase

What we did

Deliberative Session	We informed customers about a range of water resource challenges, and specific water source options, exploring contextual information and identifying areas of comprehension, appeal and preference.
Product Testing	We conducted blind taste tests with participants tasting samples representing a range of source options, followed by a reveal and discussion of the importance of different product characteristics.
Communication workshop	We conducted a deep dive on how change should be communicated for each water source option including content, tone of voice, timing and format.

Why we did this

Half of participants (strand A) did the product testing first, then the deliberative session, while the order was reversed for the other half (strand B). This allowed us to account for any ordering effects that might influence the findings, and explore where customers respond differently when thinking about source change from an individual customer (product-focused) perspective, or to a wider water system (context and source information) perspective.

We then followed up our in person sessions with an online communications workshop. This allowed us to understand participant recall of the water source characteristics discussed, and have a more practical conversation about how water companies should communicate change for the different source options.

Methodology in detail

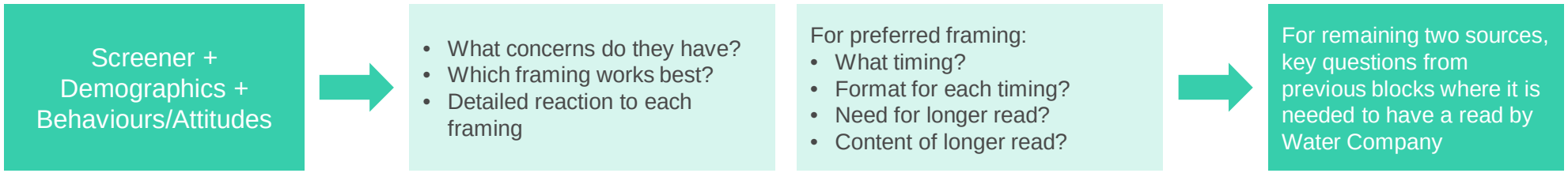
Quantitative research phase

What we did

- We conducted a quantitative survey of 1,762 Household Customers and 198 Non-Household Customers, all were customers of the 6 water companies in the Water Club.
- We tested communications using three different framings: Environmental, Human and Practical.
- We focused on the two source changes (Water Recycling and Desalination) which raised the most concern among customers during the qualitative phase, with Reservoirs included for comparison as a source change that elicited little concern.
- Quantitative questionnaire was designed with feedback from CCW, who had oversight of the questionnaire development process.
- Quantitative fieldwork was conducted between 26th May and 17th June 2022, with two separate surveys for household and non-household customers. The survey flow was as follows:

All respondents

All respondents



1/3 respondents explore communications examples and different 'framings' of the issue for each source option: Desalination, Water Recycling, Reservoir

Methodology in detail

Quantitative research phase

Why we did this

The quantitative research was designed to provide us with data that could be analysed in two ways:

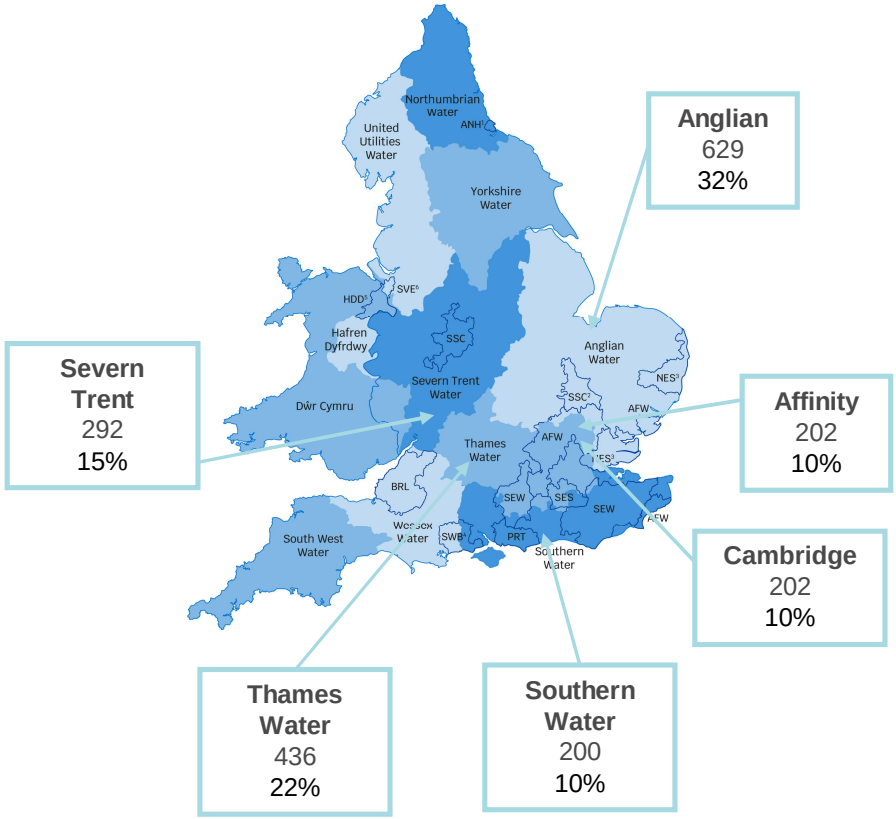
By Water Company	Across Water Club Area
• Understanding of preferred ways to frame the communication of water source change (practical, environmental or human) across different sources. • Understanding of if knowledge, understanding and engagement with water companies and source change varied significantly by region. • A robust sample of at least 200 responses by water company to demonstrate customer consultation.	• Understanding of demographic and/or attitudinal/behavioural differences and how those affect preferences across framings and sources. • Understanding the strength and limitations of each framing for each source. • Understanding the preferred length, channel, and timing of communications for each source.

The data has been weighted by age, gender and SEG to be nationally representative of the general population.

Quantitative sample

- The quantitative sample is collected to be broadly representative of customers across the Water Club area.
- Household customer data is weighted to be nationally representative by Age/Gender/SEG.
- Data was allowed to fallout naturally from sampling for each water company (representation shown on right) and not weighted by region in order to ensure good representation from all water companies within the overall sample of responses.

Total customers by water company



D6. How would you describe the area you live in? Base: All respondents Household (n=1762). Non-Household (n=198)

2 Key findings

Key findings

1. **Water is a low salience topic**, with customers indicating a low level of awareness and understanding of issues relating to it. This in part is driven by general satisfaction with the customer experience of water in terms of taste, smell and hardness.

2. **Customers also have low awareness of water scarcity**, and whilst all take steps not to 'waste' water, most are not actively trying to reduce their water consumption. Information on the topic is easily understood, however, this is not always enough in to unseat long-standing perceptions that water is abundant in the UK.

3. **Customers believe that water companies should be taking steps to respond to the issue of water scarcity now, and recognise that a mix of demand and supply-side solutions are required.** However, there is a general desire to see water companies implement demand-side options first, including fixing leaks and educating customers.

4. **When prompted, customers assess water source options by balancing efficacy (including reliability) and the cost and time commitments associated with the change.** There is also an expectation of water companies to evaluate options through this lens.

5. **Customers say they are unlikely to engage with communications on source change, and taste tests indicate that most are not able to detect differences at the level that might be expected in a source change.** However there is still a need to communicate to explain the rationale for the change, alleviate taste concerns and provide clear guidance on impact.

Key findings

6. **In terms of communication, overall the human frame best combines the qualitative and quantitative findings together.** Quantitatively environmental and human framings are slightly preferred to practical framings of a water source change, however in qualitative sessions environmental framing are felt to lack impact indicating that overall human is best.

7. **Most household customers want to be first notified three to six months in advance of the change, although non-household customers are more likely to want a closer notification of a change.** Most respondents then want to be reminded again of the change at a point closer to the time, but generally only once.

8. **E-mail and a letter separate from the water bill are the preferred forms of communication about source changes, consistent across sources.** The majority of customers claim they would click through to look at additional information. Whilst in reality this number may be lower, providing comprehensive information to those who may want it is key.

9. **Of those who are more inclined to visit a website for further detail on the change, there is an expectation that this would include a wealth of comprehensive information**. This includes detail on bills, taste, the process, the reason behind the change, safety, environmental impact and information from an independent source.

10. **Whilst there is a need to communicate on any source change, Water Recycling and Desalination in particular need more engagement due to a higher level of spontaneous concerns.** For Water Recycling these concerns are centred around taste, hygiene and safety. Desalination also generated concerns, which tended to be around taste and price

Key source-specific findings

WATER RECYCLING	Key concerns for Water Recycling centre on safety, quality and the environment, with many customers being particularly focused on the 'yuck' factor of the source which can be hard to overcome. In terms of communications, customers indicate an equal preference for either environmental or human framings.
DESALINATION	Desalination is a less well-known and understood source compared to others. Although praised for its reliability, Desalination is ultimately judged to only be suitable in emergency scenarios given the 'intense' construction and running process. In terms of communications, customers indicate a preference for the human framing.
WATER TRANSFER	Concerns about Water Transfer stem from comprehension issues and worries about quality and the environmental impact, however, generally customers are favourable towards it as a source option, seeing it as a logical solution to regional water scarcity. Communications should address environmental and taste concerns directly.
RESERVOIRS	Reservoirs benefit from their familiarity in the UK, with attitudes being generally favourable to them. However, customers do raise concerns in terms of costs, lead times and the impact of construction. In terms of communications, customers indicate an equal preference for either environmental or human framings.

3 The context shaping attitudes towards source change

3.1 Overall attitudes towards water

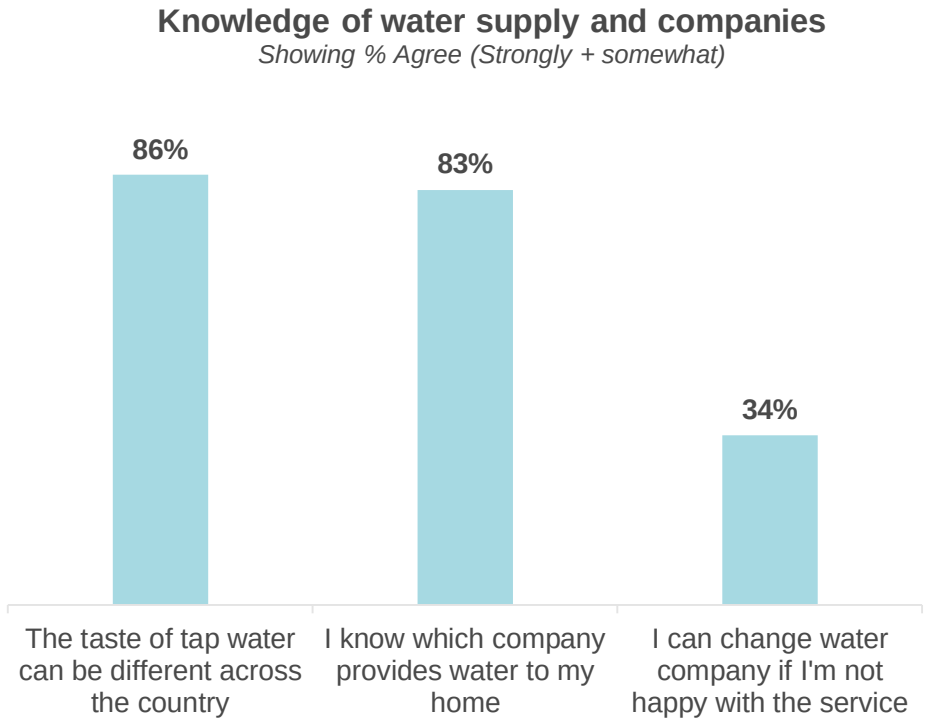
Water is a low salience topic for customers, who show low levels of concern about water-related issues

Customers cite three key factors as rationale for their low levels of concern:

Wet climate	Good infrastructure	Strong regulation
As found in previous literature and research, there is a widespread assumption that **water in the UK is abundant.** The UK is seen as a wet country, and reports of flooding in recent years add to the impression that water is plentiful.	Compared to other countries, water in the UK is felt to be **easy to access and safe to drink**. Many feel water is taken for granted, especially when compared to countries where tap water is not safe to use.	Water companies are **trusted to provide clean, safe water**. While knowledge of the water industry is limited, there is an assumption UK regulation is in place to provide safe drinking water.

A third of respondents believe they can change water company, illustrating the low level of sector knowledge

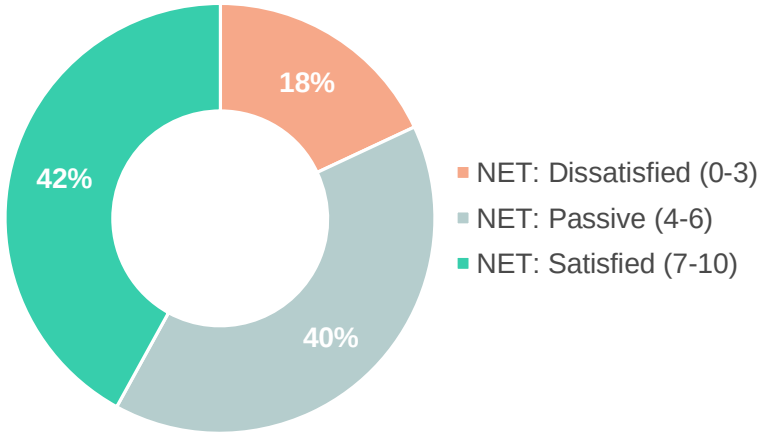
- Across both strands of research, particular audiences demonstrate lower levels of sector knowledge and will need to be particularly borne in mind when designing communications, which may need to be specifically targeted to them.
- Younger audiences,(who are less likely to be direct bill payers) demonstrate the lowest levels of sector knowledge. 43% of 18-34yr olds agree with the statement ‘I can change water company if I’m not happy with the service’.
- There are also lower levels of understanding in general from customers in urban areas, and those from ethnic minority backgrounds. 41% and 47% agreeing respectively with the statement ‘I can change water company if I’m not happy with the service’.



B4.1-3. To what extent do you agree with these statements? – ‘I can change water company if I’m not happy with the service or cost’; ‘The taste of tap water can be different across the country’; ‘I know which company provides water to my home’; .’’. Base: All respondents, HH (n=1762)

Customers are generally tolerant of their water, and it is rarely the subject of complaints

How satisfied or dissatisfied would you say you are with the taste and smell of your water?
Rated on a scale of 0-10



Safe, clean water is a fundamental customer expectation, but unless there is a tangible impact on their everyday life, few actively consider their water.

Safety and/or health are rarely mentioned as concerns when thinking about their current water supply.[1] When concerns do arise, particularly when taste and appearance change, this is assumed to be the fault of water providers rather than in-house plumbing.[2]

B6.2. How satisfied or dissatisfied would you say you are with the following aspects of your water supply? Please use a scale of 0-10, where 0 = extremely dissatisfied, 5 = neither satisfied nor dissatisfied and 10 = extremely satisfied – The taste and smell of your water. Base: All respondents, HH (n=1762)

1- Shed Research Consulting & Fasttrack Squared | WRW Regional Plan Customer Research | 2021 (SS and Cambridge Water)

2 – OPM | Customer Research and Engagement Synthesis | 2019 (Anglian Water)

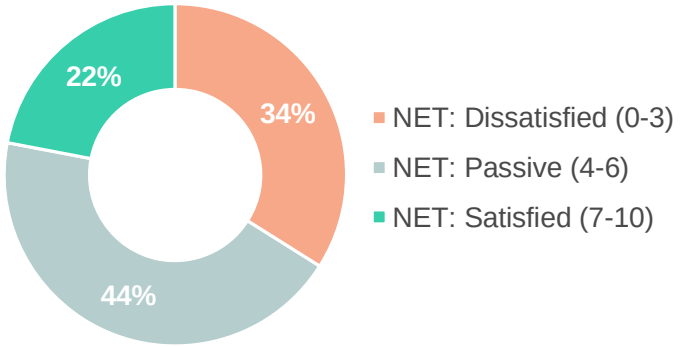
Hardness is the most commonly cited ‘water issue’ experienced by customers across most SE regions

Hardness, and associated cloudiness, of water is often the top-of-mind concern about water characteristics, though few anticipate this changing how they use water.

- People often describe the differences in the characteristics of water as differences in “quality”: quality is used interchangeably to refer to both the hardness, taste and smell of water, as well as how clean/safe it is.
- Severn Trent customers are more likely than those in other water company areas to be satisfied with the hardness of their water, with only 19% dissatisfied and 81% satisfied or passive.
- There is some awareness of local variation in water, with hardness, pressure and then taste the most common differences noticed by customers e.g. when visiting the North vs. South of England or other countries.
- However, the reasons for local variations (i.e. different sources/treatment of water) are rarely considered or understood.

How satisfied or dissatisfied would you say you are with the hardness of your water supply?

Rated on a scale of 0-10

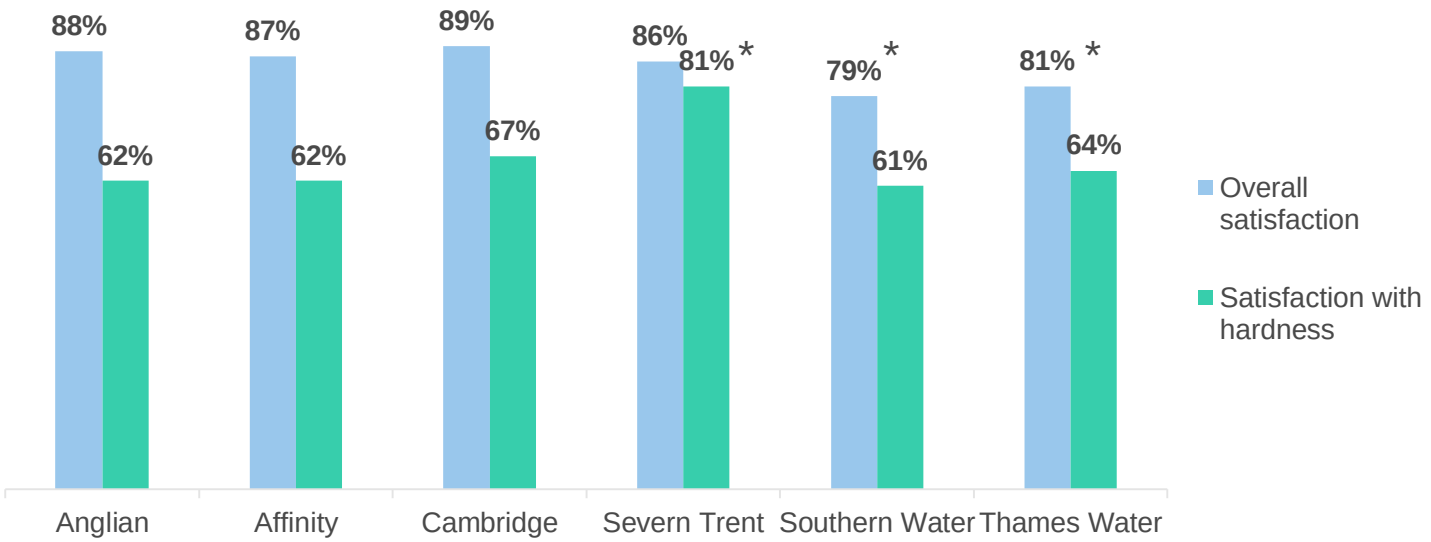


> *When we go to visit family down in Cornwall their water tastes soft. It tastes lighter and different in your mouth when I drink it out of the tap for some reason.*
>
> Household customer, Peterborough

B6.3. How satisfied or dissatisfied would you say you are with the following aspects of your water supply? Please use a scale of 0-10, where 0 = extremely dissatisfied, 5 = neither satisfied nor dissatisfied and 10 = extremely satisfied– Hardness. Base: All respondents, HH (n=1762)

Severn Trent customers are more satisfied with water hardness, overall satisfaction was directionally in line with C-Mex

Satisfaction with water company overall & hardness of water supply
(% of rating aspect of supply 4-10/10)



* = Statistically significant difference at 95% confidence level

Although satisfaction with existing supply and water hardness/quality varies across water companies, this does not correlate with the level of concern about a potential change of water source. This is explored in more detail in section 4.3

B6.1,3. How satisfied are you with the following aspects of your water supply?: Your water company, taking everything they do into account , The hardness of your water supply

Base: All respondents, HH (n=1762)

However, a (significant) minority of customers actively seek to change or improve their water at home

In this research, only a minority mention issues with the taste, smell or appearance of their water that affect their water use.

- For example, only a minority mention drinking bottled rather than tap water, or using a filter at home

Customers in **London** are more likely to filter their tap water before drinking it.

Customers in **Norwich** are more likely to take steps to manage hard water, as it is felt to be particularly problematic in this region e.g. filtering water, drinking bottled water, installing filters to soften household water supply.

Wider literature suggests a significant minority of people drink exclusively bottled water, though data varies between sources.

- Recent data from YouGov suggest that 15% of the British public do not drink tap water at all[1]
- A 2017 report for Keep Britain Tidy found most people, 69% usually drink tap water, 18% usually drink bottled water and 13% usually drink filtered tap water[2].
  - London had the highest levels of bottled and filtered water use (24% and 18% respectively), while Yorkshire and the Humber have the lowest levels (13% and 8% respectively)
- In 2016, the CCW[3] found that 67% of people usually drink tap water at home, though 27% believe bottled water is healthier than tap water

1 - YouGov | Part Five: Drinking habits and preferences | 2022 (Publicly sourced)

2 - Centre for Social Innovation & Keep Britain Tidy | Understanding provision, usage and perceptions of free drinking water to the public in the UK | 2017 (Publicly sourced)

3 - BMG research and CCW | Attitudes to Tap Water and Using Water Wisely Survey | 2016 (Publicly sourced)

WHAT THIS MEANS:

Communication must work hard to cut through and engage customers

Water is a low salience topic, driven by the perception from customers that it mainly works as it should. This means that few are considering problems relating to water, and water companies must work hard to bring customer attention to the topic of water through their communications.

Water companies should avoid causing alarm or raising concerns

Customers are generally satisfied with their current water supply and do not spontaneously recognise significant problems that they would like to see be addressed. Water companies should therefore tread carefully in this landscape, being sure not to raise alarm or concern where there currently are none, whilst still providing the necessary information to customers.

3.2 Understanding of water scarcity

Understanding water scarcity is key to source changes. Currently, there is low awareness of the topic

Water scarcity is important because it drives source change. Understanding this issue may make people more engaged and therefore receptive to source change.

However currently, only 10% of customers strongly agree with the statement 'I worry about the amount of water available for use in my local area'.

Many customers struggle with the concept of drought in the UK, finding it difficult to imagine what a severe drought would look like in the UK.

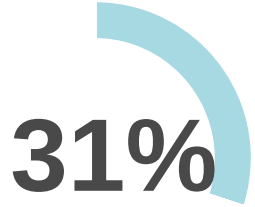
For most, drought is associated with other countries such as South Africa and Australia, which do not share the UK's wet climate.

Experiences of drought in the UK are primarily limited to hosepipe bans and low water levels in reservoirs. However, these are believed to be precautions to prevent a drought developing rather than evidence of drought itself.

B4.8. To what extent do you agree with these statements? 'I worry about the amount of water available for use in my local area..' Base: All respondents, HH (1762).

This – along with views of water being cheap and widely available - means reducing water consumption is rarely considered

Of people agree with the statement ‘I do more to save energy than I do to save water in my home/business’.



Of people agree with the statement ‘I don’t think much about saving water, I just take it for granted’.

> *I’ve got a water meter and I’m aware. It doesn’t stop me doing anything but I wouldn’t just leave a tap running. In the summer I wouldn’t water the grass because I think that’s a waste of resourced water.*

Household customer, Southampton

Customers aged 18-34, those from urban areas and those from ethnic minorities are most likely to say they take water for granted. In addition, NHH customers show significantly higher agreement with both statements, a sentiment that was reflected in qualitative discussions due to a view that cutting back could negatively impact the running of their businesses.

B4.7. To what extent do you agree with these statements? ‘I do more to save energy than I do to save water in my home.’ Base: All respondents, HH (n=1762). NHH (n=198)

B4.9. To what extent do you agree with these statements? ‘I don’t think much about saving water, I just take it for granted.’ Base: All respondents, HH (n=1762). NHH (n=198)

Where water-saving behaviour does happen, it is motivated by finances and a sense of responsibility, not water scarcity

Motivation to save water		
Moral responsibility[1]	**People have a sense of responsibility to be mindful of their water use**, with wasting water often discussed in moral terms as 'bad'. This motivates people to refrain from behaviours of wasting water (e.g., shorter showers, turning off taps).	*"I was raised to turn the light off, turn the taps off, save water."* — Household customer, London
Financial pressures[2]	Broadly, water is seen as a cheap resource. However, **people who are more financially constrained and at risk of experiencing hardship with even small increases in monthly costs are more likely to be conscious of and reduce their water usage**, motivated by the need to keep bills down.	*"If people pay exactly for what they use, than they would be encouraged to consume less."* — Household customer, Peterborough

1 – Eftec | Customer Preferences to Inform Long-term Water Resource Planning - Supply-side solutions workshop | 2020

2 – Southern Water | Affordability Concerns and Diverse Cultures | 2021 (Southern Water)

Whilst information on water scarcity does raise concern, personal urgency remains low

The idea of running out is surprising for most, and seen as a "scary" prospect – particularly given the amount of water needed per person per day.

The **basic concept of demand vs supply is well understood and recognised across other resources,** and so is key information to include to explain the issue.

Furthermore, **describing water in 'real terms'** (e.g. bathtubs, number of minutes showering) rather than practical measurements **helps to convey quantities and therefore increase understanding and impact.**

However, this information does not always unseat long-standing perceptions that water is abundant.

This is exacerbated by a perceived lack of communication on the topic from water companies, which for some is felt to undermine the urgency of the situation.

Whilst engagement with information does help educate customers, **ultimately most admit that it does not significantly change their overall perceptions towards the topic.**

This is **strongest amongst non-household customers,** who feel their usage is often key for them to operate their business effectively and therefore are often quite unwilling to make any kind of change.

Customers note that they **would only be likely to make behavioural changes if there was a greater financial incentive for doing so.**

Customers expect water companies to manage water scarcity by reducing waste and demand before increasing supply

Leak management and reduction

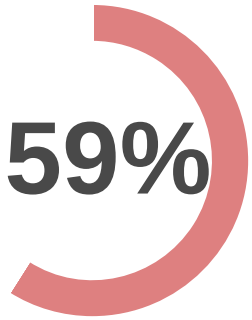
Education and support in reducing usage

Exploring new supply-side options

To be implemented immediately

To be implemented in the longer-term

Leak management is a basic expectation of water companies, which some customers feel is currently not being met



59% of customers do not agree with the statement ‘water companies are doing more to find and fix leaks than they used to’.

Customers see leak management as being a **key part of addressing water scarcity,** noting that failure to do so can make other solutions obsolete. It is therefore seen as **an urgent requirement** and for some, even a hygiene factor.

Customers also see leak identification and reduction as **a fundamental responsibility of water companies**, particularly if customers are being asked to alter their behaviours.

Overall, customers indicate that water companies **are not always doing enough to fix leaks** and **to generally improve their infrastructure.**

However, customers do also **acknowledge that leak management can be complex and difficult** for water companies, and **strongly dislike the disruption it can cause to local areas.**

B4.4. To what extent do you agree with these statements? ‘Water companies are doing more to find and fix leaks than they used to. Base: All respondents, HH (n=1762)

Customers also acknowledge their role in reducing water consumption, but expect support from water companies

Customers **recognise the need to reduce water demand and use**.

However, there is **scepticism about the impact that individual** customers can have.

Customers want to see water companies **drive change to ensure collective impact**.

Household customers **expect to receive information or equipment to improve their water efficiency at home**. They note that this is not something that they are currently receiving.

> *I once got sent a bath dam to use less water when bathing babies – but I only heard about it from Facebook.*
>
> Household customer, Norwich

Non-household customers **report even greater challenges in reducing their water consumption**. They would therefore require **targeted support** from their water company to be able to change.

> *I need to be able to get the job done, I can't compromise on that in order to save water.*
>
> Non-household customer, London

Britainthinks
Insight & Strategy

Supply-side solutions are less well understood, however, customers do believe companies should explore all options

Customers lack awareness and understanding of supply-side options. When given some information about them, they are often initially cautious:

Even after learning about water scarcity issues in the UK, for some customers solutions that require heavy infrastructure are deemed **too drastic and unnecessary.** They can be considered 'last resorts' once demand-side solutions have been exhausted.

> *What's the point in building a multimillion-pound reservoir if you're then going to pump it through a system that leaks. You sort the problem out first, and then build from that!*
>
> Household customer, Norwich

However, there is also support for **taking action now** in order to safeguard the future, with a 'rationalised' acceptance that disruption due to infrastructure development in the short-term will be necessary for longer-term gains.

> *I know it's a long drawn-out process, but overall I think it is worth it in the end*
>
> Household customer, London

OPM | Customer Research and Engagement Synthesis | 2019 (Anglian Water)

BritainThinks | Water Resources Management Plan: Stage 1, Research with Household and Non-Household customers | 2016 (Thames Water)

Eftec | Customer Preferences to Inform Long-term Water Resource Planning - Supply-side solutions workshop | 2020

Verve | Water Trading Report | 2018 (Thames Water)

WHAT THIS MEANS:

There is a need to educate more broadly on water scarcity

Given that water scarcity is driving water source changes, understanding and acceptance is key to receptiveness about proposed changes. Currently, knowledge on the topic is low, but understanding is easily improved with basic explanations about supply/demand. Using this can therefore help ensure source changes are perceived more positively.

Water companies should demonstrate that they are implementing both demand and supply side options

As well as communicating on source change, water companies should also be sure to explain to customers the other solutions that are being put into place to address water scarcity, in particular leak management and education, which are felt to be urgent solutions to be implemented in the short term.

4 Communicating water source change

4.1 What do customers think about the idea of water source change?

Currently, customers are not actively thinking about their water source, and do not know what their own source is

With high levels of satisfaction with water, **customers rarely question where their water comes from** or consider an improved or preferred water source option.

Water providers are understood to be responsible for supplying water, and **customers do not feel they have any say over where it comes from.**

As a result, **most customers are unaware of where their own water supply is sourced from** or about water source options in general.

Young people in particular have **limited existing knowledge of how water is sourced** or even the most common sources (i.e., rivers, lakes or groundwater), and regional and national variation often comes as a shock.

> *The percentage of water we get from the environment, that was a surprise. I didn't expect that because it was so high. I didn't think of it before.*
>
> Non-household customer, London

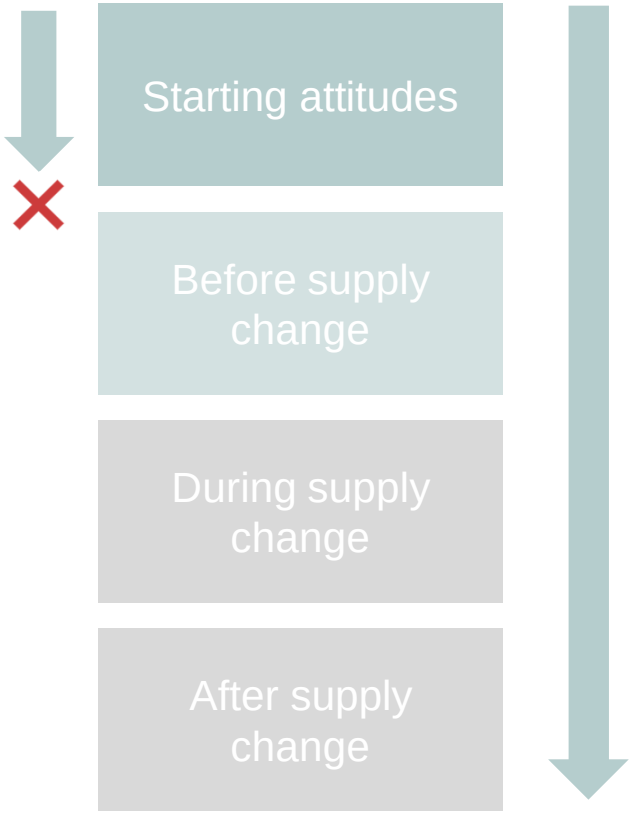
> *I've never really thought about where our water comes from – you sort of take it for granted.*
>
> Household customer, Norwich

OPM | Customer Research and Engagement Synthesis | 2019 (Anglian Water)
Populus | Hard Water Qualitative Research | 2012 (Thames Water)
Shed Research Consulting & Fasttrack Squared | WRW Regional Plan Customer Research | 2021 (SS and Cambridge Water)

There has also been a lack of exploration of customers' views during or after a supply change

Research so far has focused on attitudes to water sources, rather than experiences

- Across all research so far, customers have primarily been asked to evaluate sources in theory, rather than grounded in the reality of their lives.



There has not been a comprehensive longitudinal study to explore how views change over time and how concerns were addressed/ alleviated

- Consultations before construction tend to be the main form of engagement, but do not continue to explore whether concerns were addressed either during or after the change.
- This creates challenges in assessing any real changes in customer views and experiences.

When prompted, there *are* certain aspects that customers are interested in understanding about their water

Factors of interest in relation to extraction of water

- Cost/bill impact
- Environmental impact
- Carbon implications
  - *And whether renewable energy could be incorporated*
- Deliverability
- Water yield
- (*in some instances*) Lead time
- Long-term sustainability and suitability

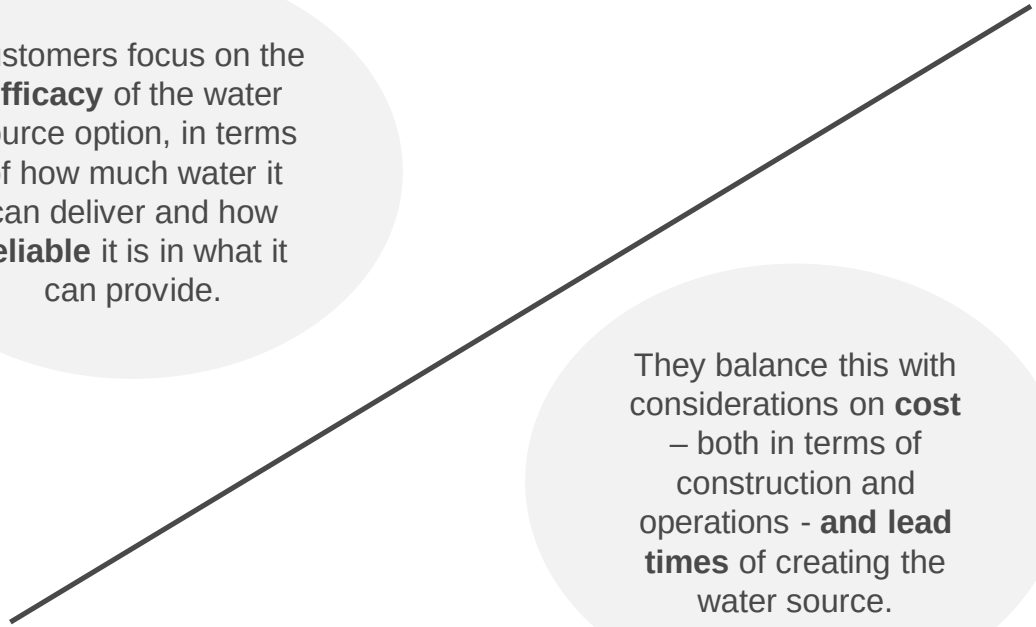
Factors of interest in relation to properties of water

- Water quality
- Hardness of water
- Aesthetic characteristics (e.g., taste, smell and appearance)

Shed Research Consulting & Fasttrack Squared | WRW Regional Plan Customer Research | 2021 (SS and Cambridge Water)
OPM | Customer Research and Engagement Synthesis | 2019 (Anglian Water)
Verve | Water Trading Report | 2018 (Thames Water)
Relish | Water for Life Hampshire Burst 19 Qualitative Report | 2021 (Southern Water)

In practice, efficacy vs cost is the core assessment made by customers when examining water source options*

Customers focus on the **efficacy** of the water source option, in terms of how much water it can deliver and how **reliable** it is in what it can provide.



They balance this with considerations on **cost** – both in terms of construction and operations - **and lead times** of creating the water source.

> *It's most important to have reliability, so that there will always water there, even during a drought.*
>
> Household customer, Peterborough

> *It should be quite easy to implement, cost effective and quick, with no impact on the environment.*
>
> Household customer, Norwich

**Please see Appendix for all materials shown*

Additionally, there is an expectation of water companies to consider the environmental impact

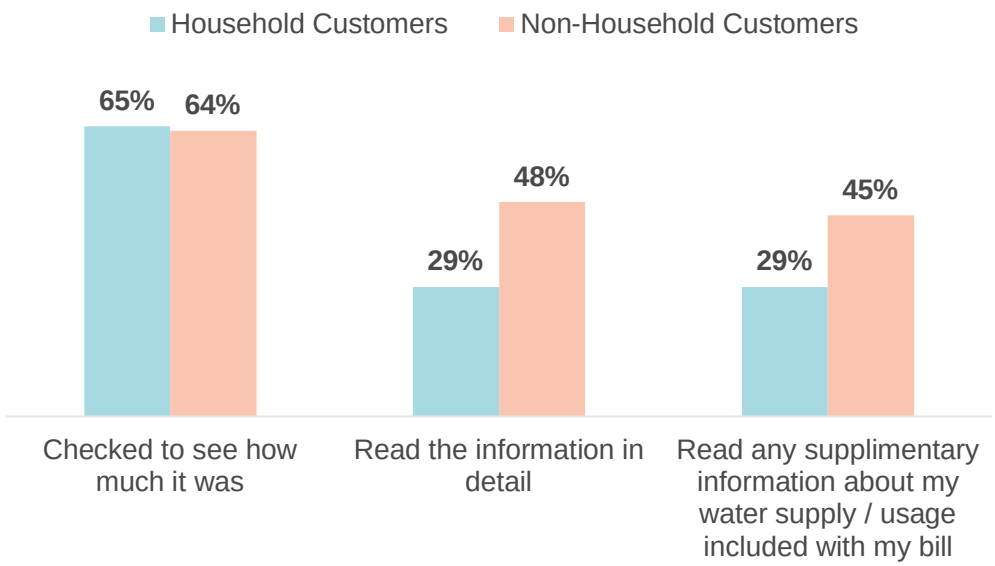
When considering their own behaviour in relation to the environment, **customers admit that it is often de-prioritised by cost and convenience.**

However, **given the scale of any water source,** there is a strong expectation of water companies to be **actively assessing and trying to reduce the environmental impact of water source changes,** both in terms of the carbon impact of construction and potential damage to eco-systems and habitats when thinking about the long-term viability of options.

> *We're a lot more aware these days of the impact we have on the environment – we need to think about what we leave behind. It could be a great option for now, but you need to think about the long-term. There's a knock-on effect, some of [the source options] will affect the habitats, the oceans and the fish that we eat – there's a bigger cycle you have to think about.*
>
> Household customer, London

Many customers acknowledge they are unlikely to engage with source change, even when made aware of it

Customers doing each with their water bill
Showing % selecting each



Overall, **most customers do not read any supplementary information about their water supply** when they receive the bill, although **the number of non-household customers that do is much higher than household customers.**

Some, therefore, **question the needs** to communicate these changes at all – particularly given the **lack of customer choice** over their water supplier, and the perception that changes 'will happen regardless' of public opinion.

> *You could ask if the public even need to know that their water source is changing – especially if it's not something they'll notice when they turn on their tap. They're probably using a lot of these [water source options] now anyway, and we don't know about it.*

Household customer, Norwich

B7. When you received your last household water bill, which of the following did you do? Base: All Bill paying respondents, Household (n=1477), Non-household (n=198)

Alongside this, evidence suggests customers are generally not able to identify different water sources themselves

Case Study: Thames Water TGWTW study

Customer research

Objectives: to understand what issues (if any) customers may have with desalinated water entering the supply

Findings:

- Most customers identified some taste differences between the three samples (current source, desalinated water and a mix of both).
- However, throughout the research the majority of participants were unable to accurately identify the different types of water they tasted.
- The majority were happy with the taste of desalinated water, and the minority who were not said they would use bottled water (due to taste preference, rather than concerns about the source itself)

This was generally confirmed in our own taste test as part of this research

As part of our research we conducted a blind taste test with customers using the below sources.

Hampton WTW Water Representative of large “water transfer” schemes	**Sundon WTW** Conditioned water representative of the proposed Anglian region to Affinity water transfer	**Denge WTW** Reverse Osmosis water representative of the kind of process that may be used in future water recycling schemes or desalination schemes	**St Albans WTW** Representative of a chalk streams water source
Little / no distinctive taste characteristics reported.	Little / no distinctive taste characteristics reported. Most liked by Peterborough participants, likely because it is the most similar to their own water.	Felt to have the most distinctive taste, although participants were split on positive vs negative reactions to this.	Little / no distinctive taste characteristics reported, however, some participants did note feeling ‘guilty’ about the source due to environmental concerns.

Whilst some minor differences were picked up by participants, all agreed that overall, they could easily adapt to all sample options.

Despite this, customers feel it is still important for water companies to communicate changes

To fulfil a responsibility	To demonstrate transparency and openness	To inform those who are more engaged	To reduce complaints
Customers generally feel that water companies have a responsibility to communicate changes to infrastructure and supply to the public, even if they feel they are unlikely to engage with these communications personally or in-depth.	The potential damage in terms of customer satisfaction and brand reputation that could come from purposely withholding information on water source changes is seen to outweigh the downsides of communicating on a low engagement topic.	Although in the minority, there are some customers who are more heavily engaged with this topic. Therefore, there is a need to ensure that this group's needs are met in communications even if they do not represent the masses.	While it may be unlikely that source changes will noticeably impact the water that comes out of customers' taps, notifying them of these changes can pre-empt complaints that they might make should they notice any differences.

There are instances of a difference in taste being detected – creating problems as the change had not been communicated

Case Study: Horley Cross, UK[1]
Addressing myths

Issue: Customers reported concerns after the taste of their water changed. This followed increased chlorine in the supply to tackle bacteria in Horley Cross, which had not been communicated.

Comms approach: Response statements were disseminated by the water company and local government, but were written and declared by public health bodies

Impact: Timely communication and partnership with (credible) public health bodies helped to settle the scare

Case Study: Copeland, UK[2]
Communicating in advance

Issue: After a planned change in supply (which was not communicated publicly), customers noticed a change in hardness and taste when their water source supply changed, leading to complaints, safety concerns and customers switching to bottled water.

Future learnings: After their investigation, DWI recommended: informing customers about changes and possible effects in advance, ensuring call centres are fully briefed to field queries, and including changes to aesthetic characteristics in risk assessments

1 - Affinity Water | 20 Day Report on Consumer Contacts following the planned increase in chlorine residual from Horley Cross WTW | 2018 (Affinity)
2 - DWI | Copeland area: Consumer concern about drinking water | 2017 (Publicly sourced)

In other cases, insufficient communication can even halt water source plans altogether

Toowoomba, Australia
Overcoming psychological barriers

Issue: Plans to launch a water recycling scheme were met with heated opposition by concerned residents who gained public traction

Comms approach: The water company failed to get ahead of the outcry which evoked the 'yuck' factor, and residents felt they were an experiment.

Impact: The water company failed to launch a water recycling scheme

San Diego, USA
Communicating rationale + need

Issue: The development of a new water recycling plant failed to gain public support

Comms approach: The water company did not make sufficient efforts to raise awareness of the project or provide alternative solutions

Impact: The public felt like guinea pigs, without the information they needed to understand the rationale and impact of this source change

Communications should therefore explain the rationale and allay concerns

Ultimately, communications need to pre-empt potential public and media responses by:

Explaining the rationale of the water source change	Communications need to clearly explain both **why the change is being made on a broad level** (i.e. to maintain water supplies, to respond to water scarcity issues) and **specifically why that source has been chosen.**
Alleviating concerns, particularly regarding taste change	Communications **should directly address any known challenges or barriers that customers have about water sources**, in order to reassure them of the change. Across any water source change, communicating that there will be no noticeable change to the taste is particularly key.
Providing clear information on impact	Communications should also contain **practical information for customers about any potential impact on them** in terms of the construction or change beyond the experience of the water itself.

The timing of communications should also be a key consideration

Customers are aligned in their belief that they should be given advance notice of a water source change. However, communication too far in advance can:

Indicate that there is a danger or issue when there is not one.	**Make customers less likely to engage in the subject letter.**	**Create problems or confusion if the change is ultimately not carried out.**

Specific timing requirements vary by water source change and also by individual household and non-household customers (i.e. their proximity to construction). The following section will explore this in more detail.

WHAT THIS MEANS:

Communication on water source change is necessary

Although many customers are unlikely to engage with communications relating to source change, the potential risk of *not* communicating is much greater. Water companies should therefore communicate to explain why the water source change is happening, give reassurances on what this will mean and also provide any practical detail relevant to customers e.g. on construction.

Water companies should have a clear rationale for selecting one source over another

When prompted, customers do recognise the different impacts that water source options can have both in terms of their extractions and the properties of the water. As such, they expect that a decision to change water source is driven by careful analysis of the effectiveness (including reliability) against the cost and timings of the source.

4.2 Attitudes towards water source options

We explored four key water source options with participants during the qualitative research

Reservoirs	Water Recycling	Water Transfer	Desalination

For each water source option, customers were provided with information about:

- **What it is –** a brief summary of the process involved as part of this source option
- **Is it already used –** a brief statement of how prevalent this source option is currently in the UK
- **Case study –** an example of how this source option (or a proposed option) is used in the UK, detailing the upfront and running costs, water production volume and construction timeframes
- **Performance assessment** – an overview 'traffic light' rating for this source option across specific criteria (amount of water, lead time in years, cost, reliability under drought, resilience to other hazards, energy use/carbon, positive/negative environmental impacts

*The **quantitative survey** explored communications examples for Water Recycling and Desalination, as these were the source options that raised the most concern for customers during the qualitative stage (detail on this can be found in the following slides). Reservoirs examples were also included in the survey to provide a change option that is currently more familiar to customers. Water Transfer examples were not included as this source option raised fewer concerns, and provoked a more neutral response from customers in the qualitative research; this made it a lower priority to test in the survey.*

Spontaneous awareness and understanding of water sources varies between the different options

Existing knowledge of different water source options is low, particularly of those less commonly used in the UK at the moment. Desalination is often the least known, and where there is awareness, it is often associated with other countries with drier climates than the UK e.g. Canary Islands, the Middle East. Reservoirs on the other hand benefit from a sense of familiarity due to their commonness across the country.

Reservoirs

Water Recycling

Water Transfer

Desalination

High awareness

Low awareness

For the majority of customers, Water Recycling is the source option that spontaneously raises most concern

Highest concern

Water Recycling / Reuse

Water Recycling evokes the strongest negative response from customers, largely driven by safety concerns.

Desalination

Water Transfer

The perceived complexity of Desalination and Water Transfer presents a barrier to engagement with these source options.

Reservoirs

Reservoirs are the most appealing of the source options, with the perceived benefits seen to outweigh the, relatively few, concerns.

Lowest concern

While common concerns do exist across source options, each faces specific challenges that present barriers to engagement

Highest concern

Lowest concern

	Top 3 perceived challenges once informed		
Water Recycling / Reuse	Safety	Quality	Environment
Desalination	Comprehension	Environment	Safety
Water Transfer	Comprehension	Quality	Environment
Reservoirs	Disruption	Cost	Lead time

4.3 Overall considerations for communicating source change

In communicating source change, key concerns centre on any potential differences in the water itself

Given **low engagement** with the topic of water stress, participants are more likely to engage with information about source change when it relates to the **impact on them as customers** i.e., on the quality, taste, characteristics and properties of the water coming out of their tap.

Communications will therefore need to **frame water source changes** as relating to a **'customer product'** context in order to feel relevant and informative, and to succeed in alleviating customer concerns.

Key information customers see as necessary to include as part of this:

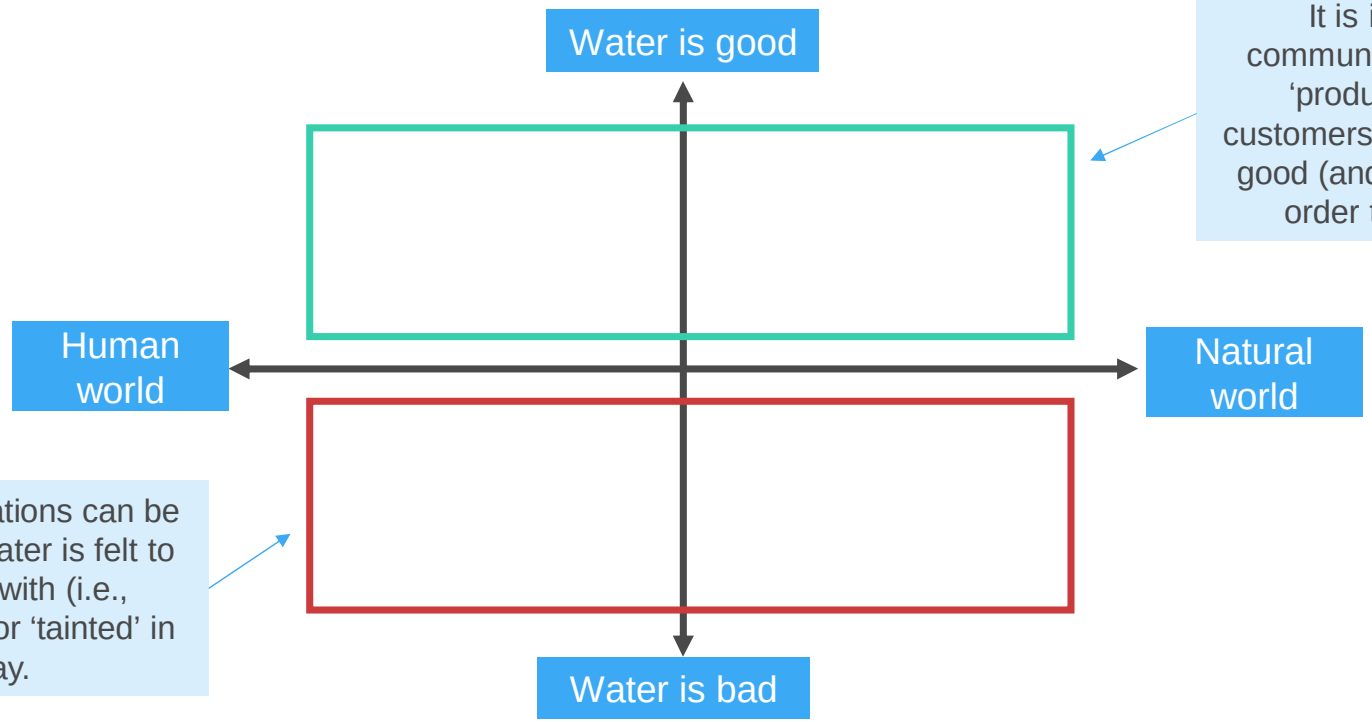
- Why the change is necessary
- Detail on the tangible impact on them as customers (bills, quality and characteristics of water from their tap)

Further detail on the processes involved in new source options is not seen as particularly necessary unless these will have a tangible impact on the water they receive at home.

> *The only time I log on to Anglian water is if I have a problem with my bill or something has gone wrong.*
>
> Household customer, Norwich

> *I would want to know how it affects the cost, why this source is better, what happens to the water…For any change we want to know why we need the change.*
>
> Household customer, London

Existing research points to customer perceptions of water as something that should always be ‘good’ and ‘natural’



It is important that communications frame the ‘product’ received by customers within this realm of good (and ideally natural) in order to be accepted.

Negative associations can be sparked when water is felt to be interfered with (i.e., processed), old or ‘tainted’ in any way.

Yonder | Semiotics of Water | 2020 *(Southern Water)*

There are 5 key factors that should be considered when communicating water source changes in this context

Language

- Simple and ‘to the point’ language is important for both explaining this topic and capturing customers’ attention.
- Technical language can feel confusing and risks raising more questions, with a preference for ‘lay’ terminology (e.g., terms such as ‘reverse osmosis’).

Tone of Voice

- Communicating with a sense of neutrality and ‘business as usual’ feels appropriate for this topic (i.e., source change is not considered a ‘big deal’ for customers).
- This can feel reassuring, and avoids raising alarm or concern about source changes.

Channel

- Shorter, concise information works well for initial communication, streamlined alongside other comms (e.g., emails, bills.
- Customers can then be directed to further, more detailed additional information (e.g. weblink, contact numbers.

Timing

- The timing of communication (i.e., how far in advance of the source change) is aligned with the anticipated level of disruption to the customer (e.g., getting in touch earlier if construction is planned.
- Providing a timeline of future key communication points offers a sense of consistency and clarity to projects.

Messenger

- Water companies are seen as a logical key messenger on this topic.
- Some external, neutral, voices can offer relevant endorsement and reassurance (e.g., planning authority).
- However, this is not always necessary and can risk raising alarm (e.g., involvement of Public Health, regulator).

Taking this into account we tested three distinct framings of water source change in the quantitative research:

Environmental

- Longer, more detailed explanation of the change, and the reasons why a water source change is being made.
- Environmental focus, explaining more of the context and benefits from a move away from a chalk water source.
- **Hypothesis**: customers want to know why a change is being made, and once satisfied by the rationale will be happy with the impact.

Human

- Focused on the impacts of the change and the reasons why the change is being made.
- Provides information about the new source being selected and the practical consequences of the change to that source.
- **Hypothesis**: customers want to know how they will be affected and have little interest in the rationale for change.

Practical

- Shortest of the three communication formats.
- Containing just the essential information about the water change and practical details about impact.
- Does not include background information on sources and/or detailed information on the source.
- **Hypothesis**: customers have little or no interest in source change beyond the acknowledgement that they are happening.

Detailed analysis of responses to the three framings for each of the water source options that were tested can be found later on in this section.

Across all source options, there are commonalities in how the framings are received

What worked well

- The fact that “you don’t need to do anything” is received positively by customers.
- A common theme is “this is beyond my control so I’m not worried about it”.
- In general customers find the letters relatively easy to understand and appreciate a straightforward tone and the reassurance that the letters provide.
- Emphasising that the change would be minor and safe, and that customers would not see major changes to their supply is cited as a positive.
- The fact there would be a reminder is cited frequently as a positive aspect of the letter.

Watch outs and additional information to consider

- In general, those who find the letters more difficult to understand are evenly split between those who feel the frames don’t give enough information and those who feel there was too much information.
- Across all source options, customers struggle to understand the context about demand and supply.
- For both Recycled and Desalinated Water, there is a frequent request for more information about the water source. For Reservoirs, there are occasional requests for more information on where the reservoir will be located.
- Customers are frequently concerned about mentions of hardness / taste changing, and seek more information on this impact.
- Being clear about the dates for any upcoming changes up front is cited as important across frames and water sources.
- If an impact on bills is not mentioned, as in the environmental frame, customers commonly mention wanting information on this. Even where it is stated there will be no impact, customers express scepticism about this and ask for more information on price impact.

Verbatim analysis: All respondents HH (n=1762), NHH (n=198)

Example of findings: Reassurance about what will *not* change is the most liked part of the practical framing

- >20% Net likeability (like-dislike)
- >10% Net likeability (like-dislike)
- >0% Net likeability (like-dislike)
- =/<0% Net likeability (like-dislike)
- >-20% Net likeability (like-dislike)

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water. The only change you may notice is a slight difference in taste and the 'hardness' of your water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available.

To ensure we provide you with a secure long-term supply of water, your new water source will be from a new reservoir. Reservoirs provide a very reliable, low-cost source of water. Water can be taken from rivers during the winter when it is in plentiful supply and stored so it can be used in drier periods.

Please be assured that the quality and safety of your water will remain the same and you will not experience any disruption to your water supply or need to take any action.

What happens next?

We will remind you of the change to your water source by text message a few days before the 1 September.

If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

How can you help?

We can all contribute towards a long-term reliable supply of water by being more water efficient. This can be as simple as turning off the taps when we brush our teeth, reporting leaks and taking more showers and fewer baths. For more information on how to be water efficient, please visit www.waterefficency.co.uk.

48% of respondents like the reassurance about the change not affecting the bill, quality or pressure, the most liked paragraph in all 3 letters

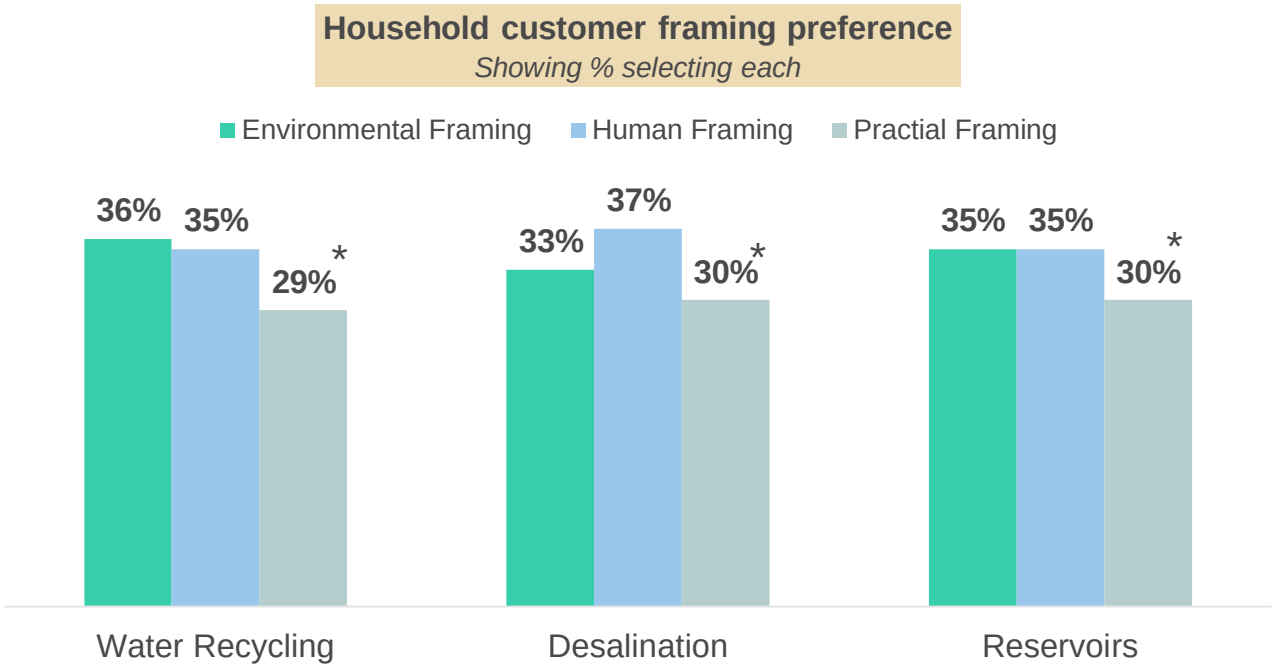
By contrast 39% of respondents dislike the possibility of a difference in hardness / taste, the most disliked paragraph of any framing

Providing reassurance about the new source, and that it will be reliable and not cause disruption is liked by respondents

Clarity that there will be a reminder is strongly liked

S5 Please read the following letter, which sets out a hypothetical future change in the supply of the water. When you have finished reading it, please show us which parts you like or dislike by clicking
Base: All respondents seeing reservoirs, HH (n=605)

Overall, the environmental and human framings are slightly preferred to the practical framing



* = Statistically significantly lower at 95% confidence level

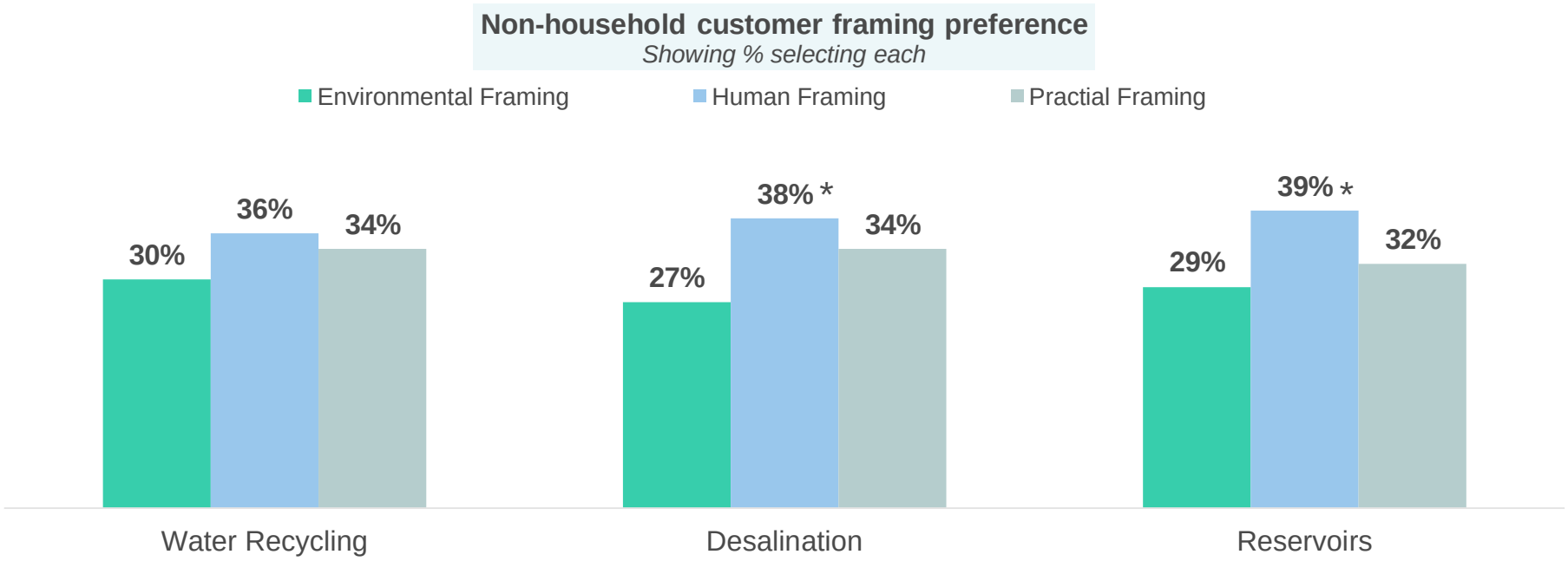
Whilst specific communications examples were not tested within a qualitative setting, customers generally indicate a preference for some form of 'practical framing' in communications that focuses on the impact on them ahead of 'environmental framing', which feels important but lacking in personal relevance and impact.

However, in a quantitative setting, the environmental lens emerges as being more important. The added length and reassurance of the environmental frame is helpful quantitatively, while the human frame does a better job of addressing the practical concerns about the source change.

F1+S6. Thinking about the three ways of communicating this change to your water supply, overall, which of these do you prefer?

Base: All respondents, HH (n=1762 Water Recycling, n=1762 Reservoirs, n=1650 Desalination)

For non-household customers, the environmental frame is seen as less relevant



* = Statistically significantly lower at 95% confidence level

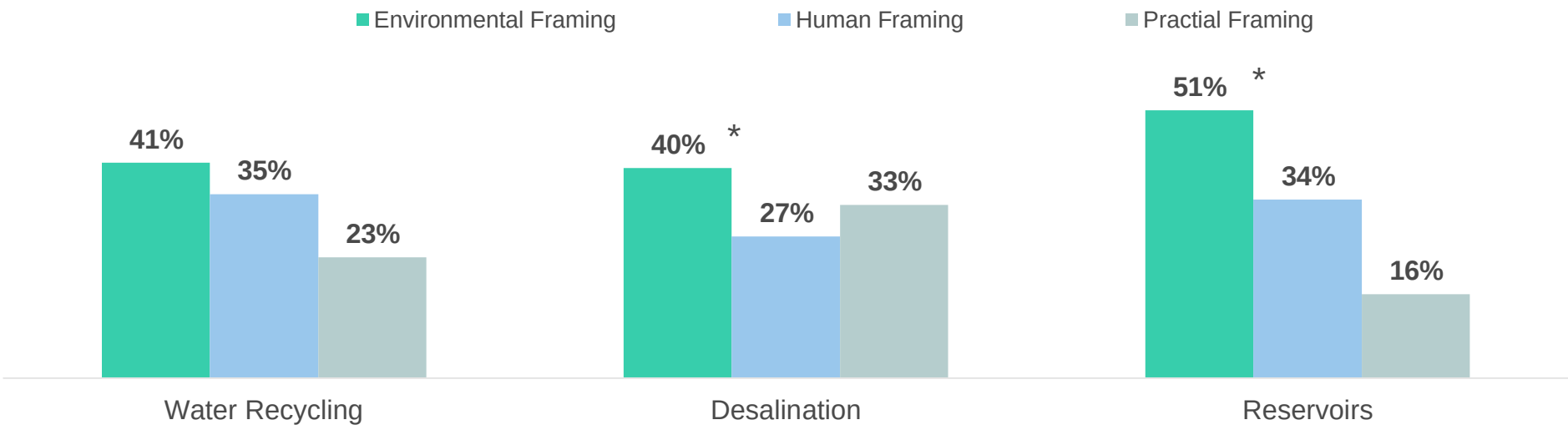
S6+F1 Thinking about the three ways of communicating this change to your water supply, overall, which of these do you prefer?

Base: All NHH respondents (n=198)

Among subgroups, only environmentally aware individuals show a consistent preference across sources

Highly environmentally aware individuals framing preference

Showing % selecting each



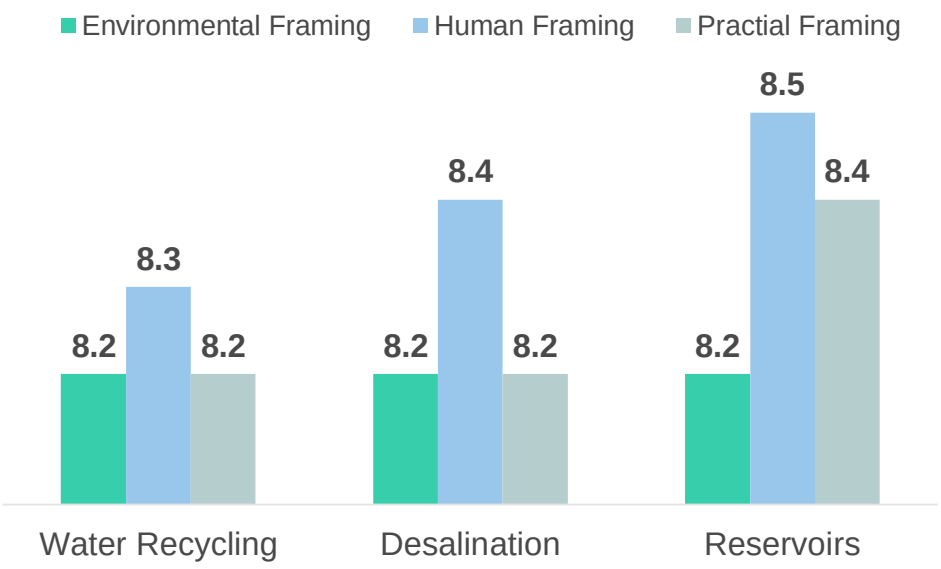
* = Statistically significantly lower at 95% confidence level

S6 Thinking about the three ways of communicating this change to your water supply, overall, which of these do you prefer?

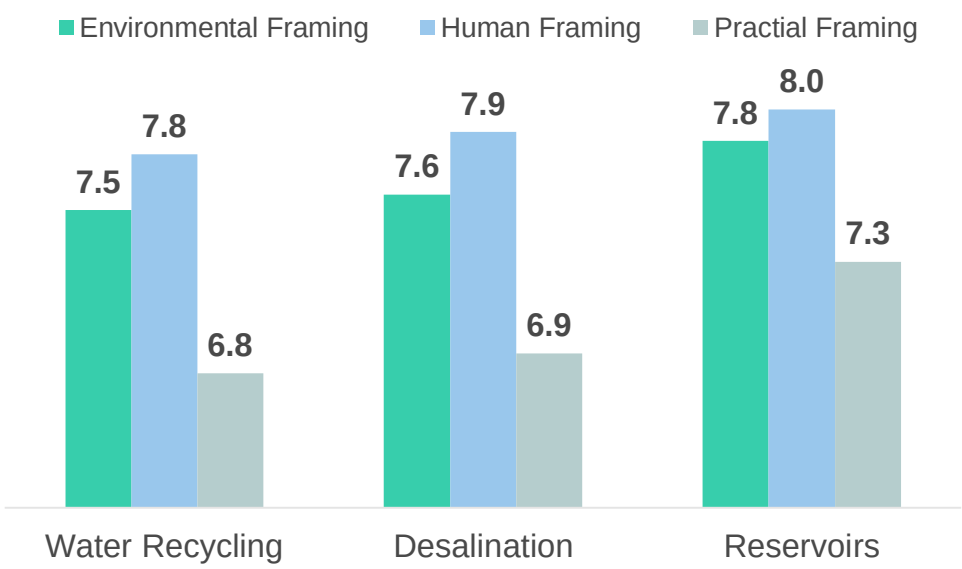
Base: HH Highly Environmentally Aware (Those with strong agreement with the statements " Protecting lakes, rivers, reservoirs, fish and other aquatic plants and wildlife is really important to me and I am concerned about the impact of climate change on the natural environment in my area) (n=269)

Household customers see the environmental framing as harder to understand, and as giving marginally less information

Household customer rated ease of understanding of each framing
Showing mean score out of 10



Household customer rated information provision of each framing
Showing mean score out of 10

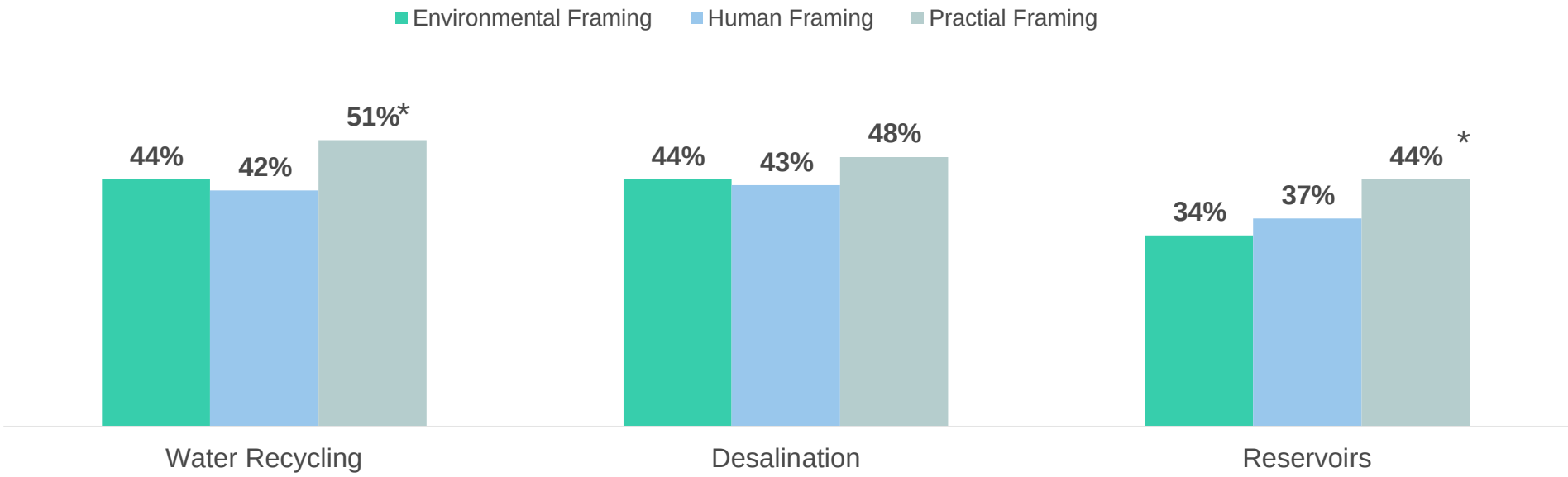


S1 - How easy is this letter to understand? S2- To what extent does this letter tell you everything you need to know about this change? Base: All respondents, HH (n=1762), (n= 605 Water Recycling, Reservoirs) (n=552 Desalination)

Household customers are significantly more concerned about the change when given the practical framing

Rated level of concern about change after seeing each framing

Showing % concerned (very + somewhat)



* = Statistically significant difference at 95% confidence level

S4 - If you received this letter, how concerned would you be about this change of your water supply? Base: All respondents, HH (n=1762) (n= 605 Water Recycling, Reservoirs) (n=552 Desalination)

In general customers show similar levels of concern across customer types with the following nuances*

- Middle aged customers (35-54) and property owners report more concern about Reservoirs as a source change across framings than other customers, likely reflecting concerns about Reservoir location and construction.
- Highly environmentally aware customers consistently report more concern about source change to a Reservoir or Recycled Water, this is lower when they are given an environmental framing, but still elevated indicating that the environmental lens may need some inclusion for these specific customers to provide information to avoid possible complaints
- Customers who are *currently* dissatisfied with their water company, whether overall or in terms of the taste, reliability and/or hardness of the water **are not** statistically more or less concerned about a source change than average customers across any framing.
- Customers who report reading bills in detail and always reading supplementary information with bills report higher levels of concern across sources, reinforcing the need for supplementary information to be available as these customers are likely to always want additional detail to regular customers
- Non-household customers show slightly higher levels of concern compared to household customers, although not to a statistically significant level. Information about supply disruption is key to this group.

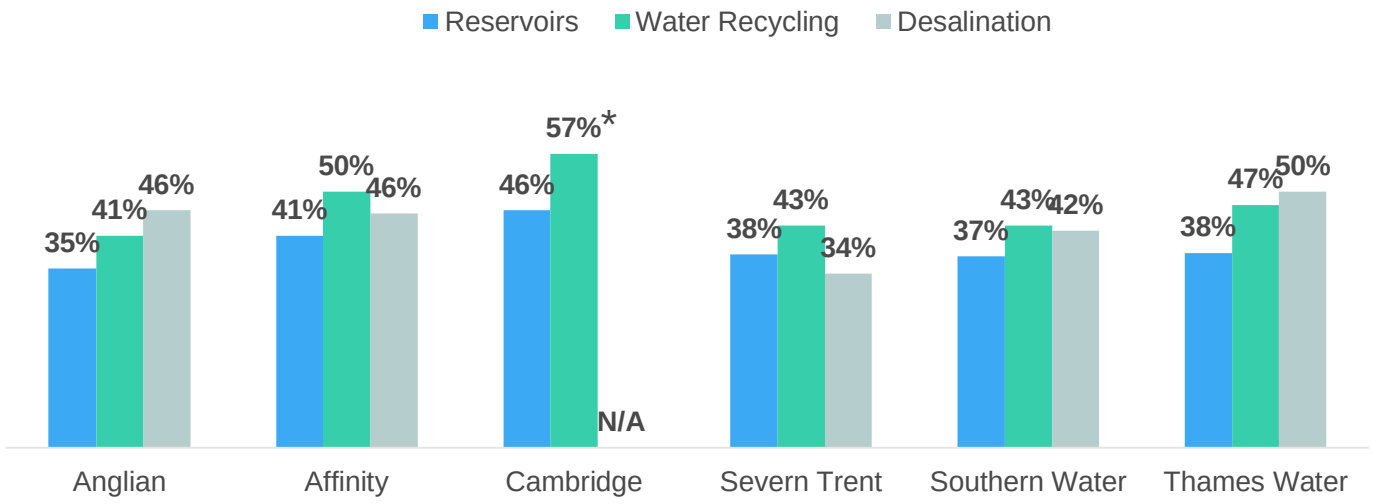
* Full data for these subgroup breakdowns is available in report appendix

S4 - If you received this letter, how concerned would you be about this change of your water supply? Base: All respondents, HH (n=1762) (n= 605 Water Recycling, Reservoirs) (n=552 Desalination)

Overall, Cambridge water customers are slightly more concerned about possible source changes than other customers

Rated level of concern about change – Average across framings by water company area

Showing % concerned (very + somewhat)



* = Statistically significant difference from other Severn Trent, Thames, Southern, Anglian Water at 95% confidence level

*Desalination not within Cambridge Water future plans

S4 Combined average - If you received this letter, how concerned would you be about this change of your water supply? Base: All respondents, HH (n=1762) Results from frames combined and averaged across water companies

Analysis of verbatims does not indicate a single consistent reason why Cambridge Water customers are more concerned than other customers about source changes.

Indicatively, for reservoirs there are a number of customers who indicated that they are particularly concerned with water hardness from a reservoir, and for water recycling a desire for more information on safety and chemicals is mentioned frequently.

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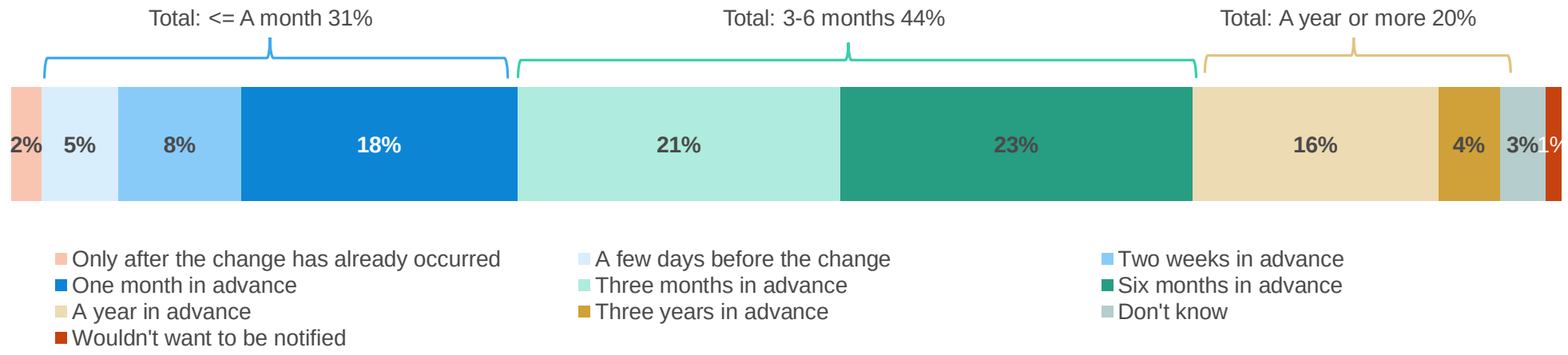
WHAT THIS MEANS:

The human frame provides customers with the most information and performs best across customer groups	While both the human and environmental frames perform strongly with household customers in the quantitative research, the human framing is overall the preferred framing as it best marries the findings of the qualitative and quantitative research together, and best reflects the specific concerns that customers raise about individual sources.
The most important information to land in communication about water source change is clear information on customer impacts	Customers are **most concerned about the personal impacts of water source change** and the effect this will have on their water supply in terms of hardness, taste and the impact on their bills. Giving clear information about what will and will not change in relation to these human impacts is the most important aspect of communication around a water source change.

Most household customers want to be first notified three to six months in advance of the change

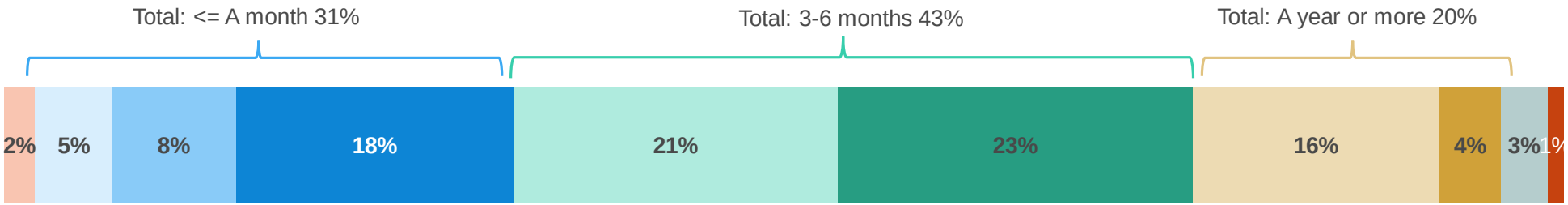


N.B This was consistent across water sources with no consistent differences observed by water source type or demographics

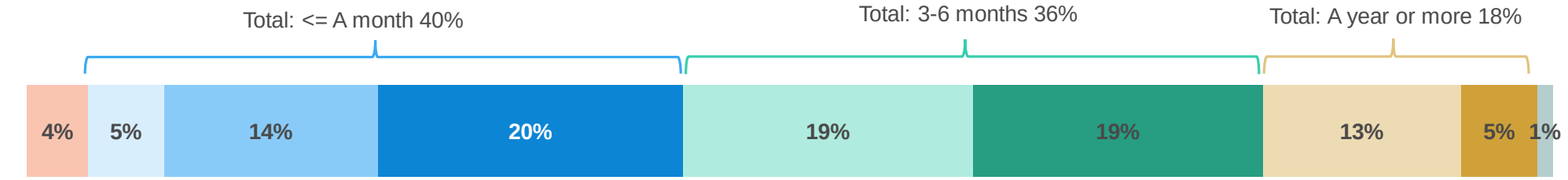
S7. Thinking about this change, how far in advance would you first want to be notified by your water company about this upcoming change to your water supply? Base: All respondents, HH (n=1762)

Non-household customers overall are more likely to want a closer notification of a change

Household customers



Non-household customers



S7. Thinking about this change, how far in advance would you first want to be notified by your water company about this upcoming change to your water supply? Base: All respondents, HH, (n=1762), NHH (n=198)

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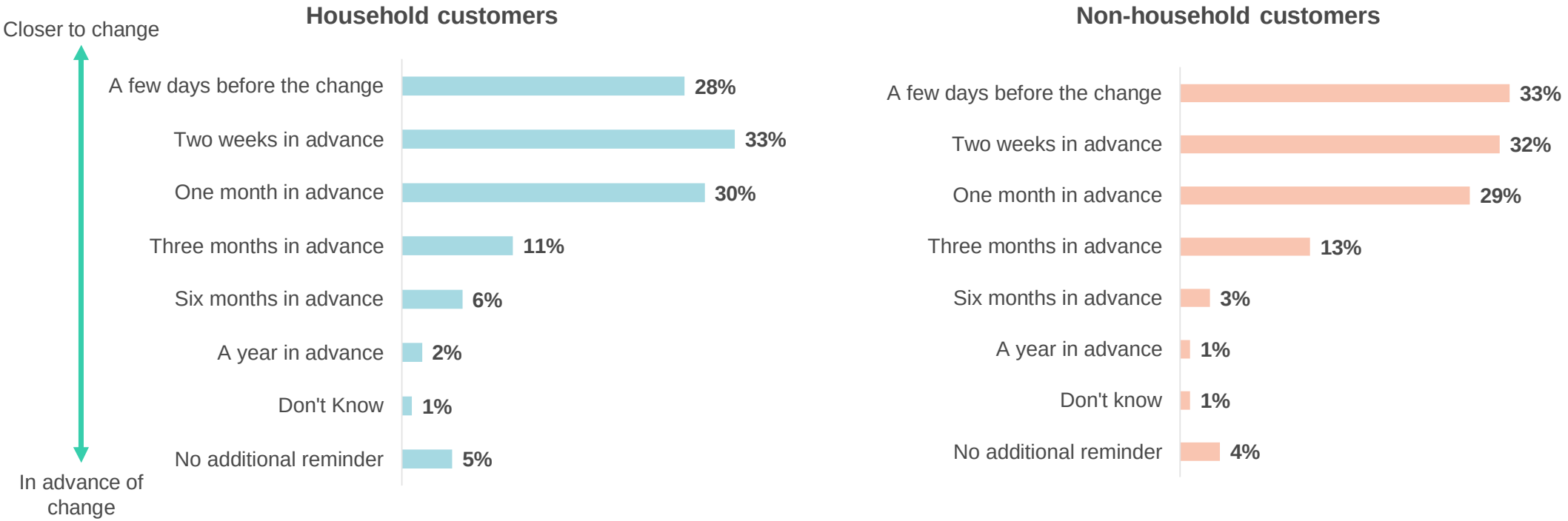
Most respondents want to be reminded again of the change at a point closer to the time, but generally only once

What points after the first notification customers would you want to be reminded about the change of supply?

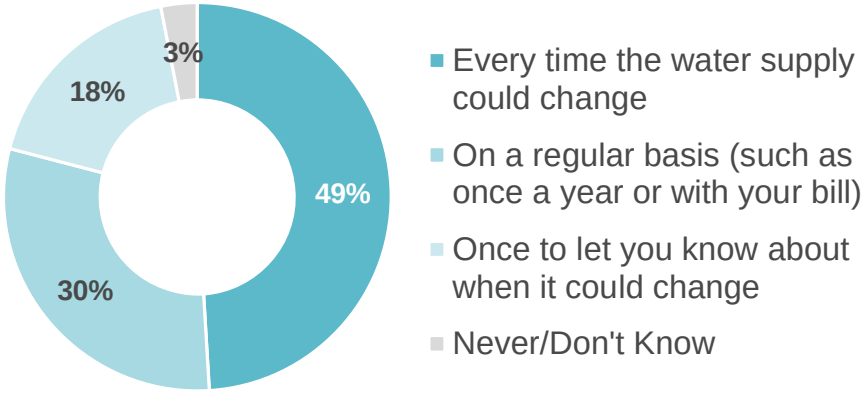
Showing % selecting each option



S8 And following this first notification, at what points would you want to be reminded about this upcoming change of supply? Base: All those who would want to be notified of a change prior to the switch, HH (n=1430), NHH (n=177)

Half of household customers want to be told of a temporary or seasonal change each time it occurs

Desired communication from water companies about seasonal supply changes
Showing % selecting each option



Highly environmentally aware customers **(59%)** and those who identify as very pessimistic about being able to afford basics **(56%)** are most likely to want to be told every time that the supply could change.

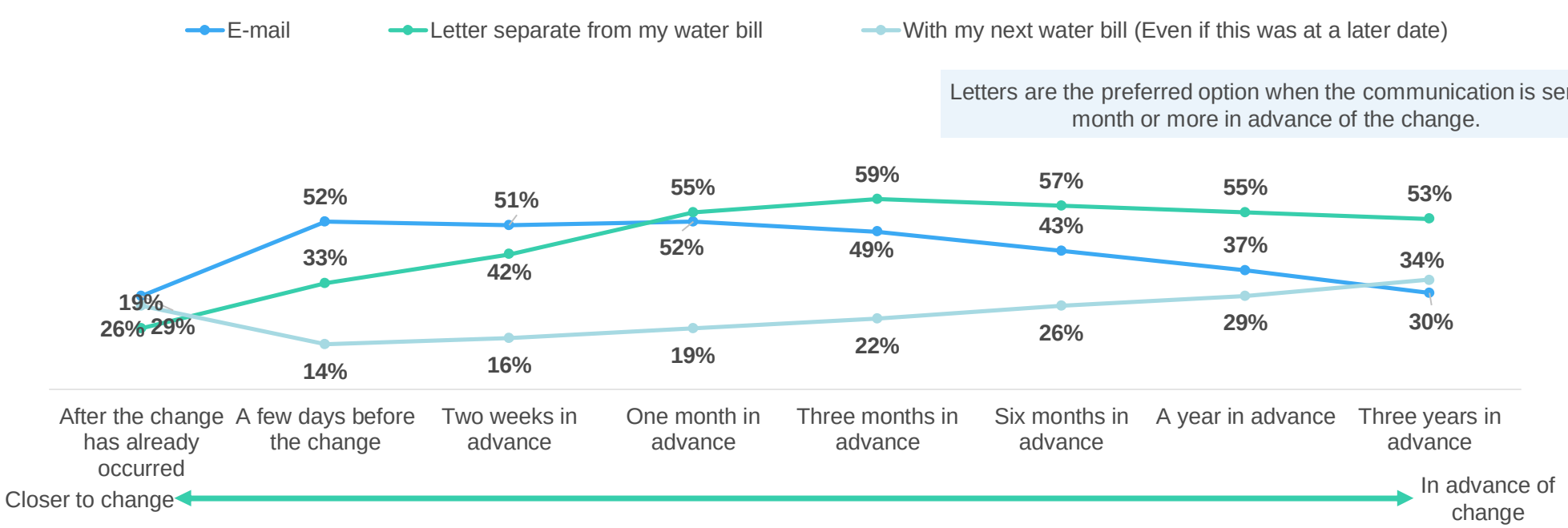
Non-Household customers exhibit similar preferences to household customers.

S9a. If the source of your water supply was likely to change at different times of the year (i.e. in the summer when supplies from your usual water source were lower) - how often do you feel the water company should communicate around this change? Base: All respondents, HH (n=1762)

Highly Environmentally Aware - (Those with strong agreement with the statements " Protecting lakes, rivers, reservoirs, fish and other aquatic plants and wildlife is really important to me and I am concerned about the impact of climate change on the natural environment in my area)

Customers would generally like to receive communications via email or a letter

Desired communication format from water companies about supply changes for each time period
Showing % selecting each – Top 3 comms methods only



S9. [thinking about the times you would want to be notified of a change of supply] What formats would you want to receive this information in at each point? Base: Respondents selecting each communication timing, HH (n=30-732)

A majority of customers *claim* they will click through to a website and look for more information about a change

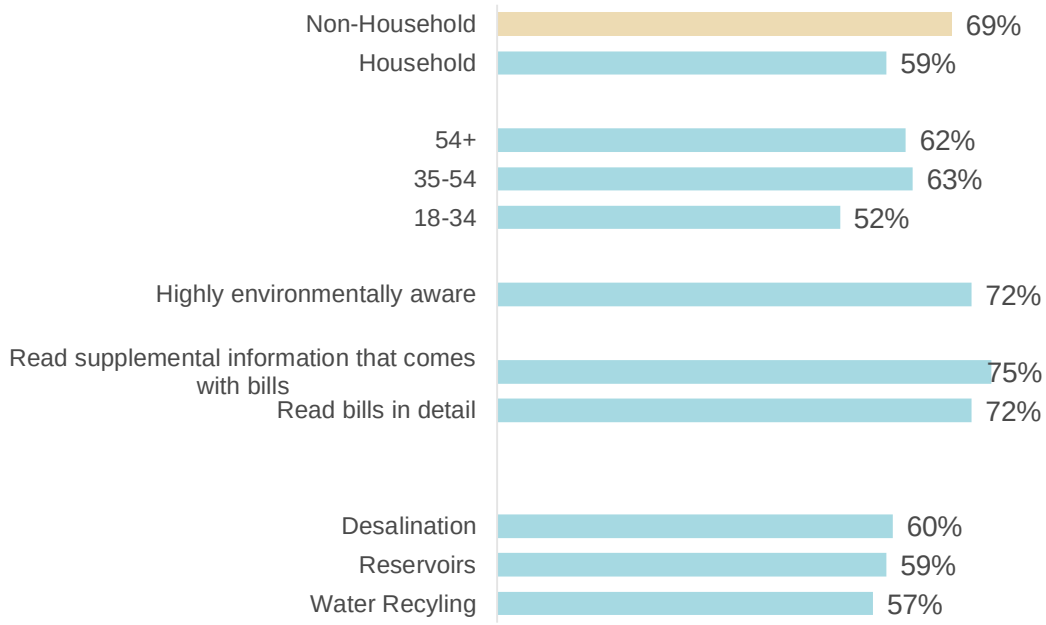
In the qualitative research, customers are likely to say that having more information available was important, but that they are unlikely to personally click through to read it.

In the quantitative research however, a majority of customers say they definitely or probably would click through a link to access more information about a source change.

Given the findings from the qualitative research, and the earlier quantitative finding that only 29% of Bill payers read supplemental information that goes along with it, it is likely that there is some overclaim in this statement.

However, this does act as reinforcement that it is important to have comprehensive information available for customers to access *if needed* to provide reassurance on topics of particular interest to them (such as the environment).

How likely would you be to click through and look for more information?
% Definitely/Probably would click through



S10 Looking at the information provided, more information on this water source change is available through www.watersourcechange.co.uk. How likely would you be to click through and look for more information? Base: All Respondents HH (1762) , NHH(198)
Highly Environmentally Aware - (Those with strong agreement with the statements " Protecting lakes, rivers, reservoirs, fish and other aquatic plants and wildlife is really important to me and I am concerned about the impact of climate change on the natural environment in my area)

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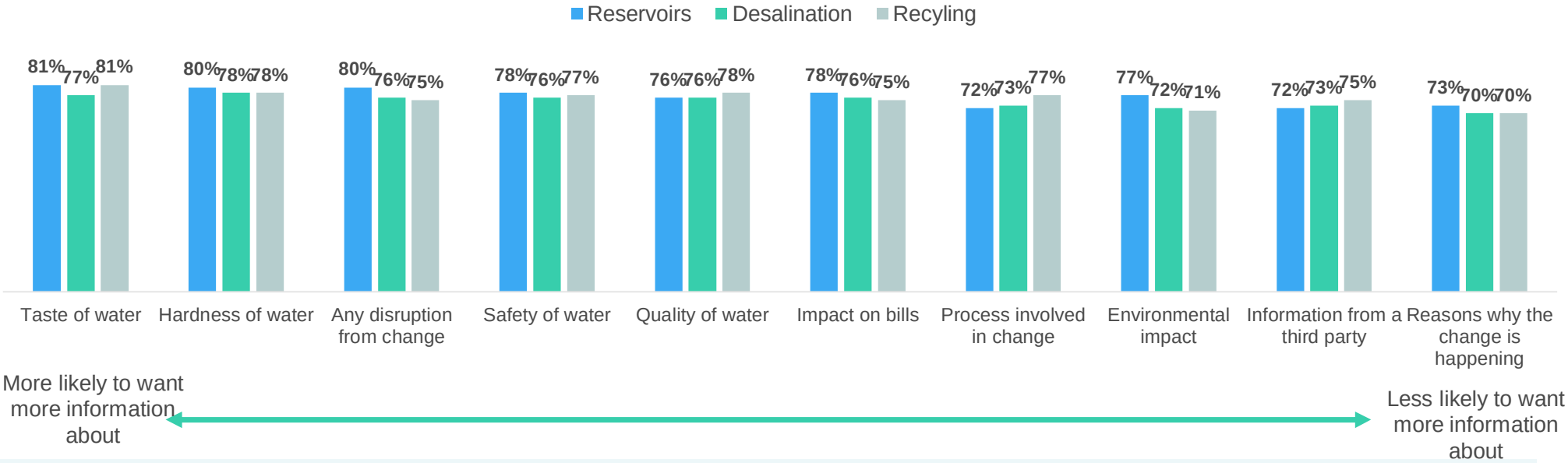
Customers who would use such a website generally want any linked website to be a comprehensive source of information

What information would you personally want to be available on this website?
% Definitely/Probably would want to read more about this



The high level of additional information customers would want reflects the low level of customer familiarity with water source change. Although customers want information on all topics, they are most interested in the practical effects of the change, mirroring the qualitative findings, and detailed readings about the aspects of the change it is most important to land with customers.

S11- What information would you personally want to be available on this website (in addition to the information shown in this communication)

Base: All Respondents HH (1762)

Implications of quantitative findings for the five key communications factors

Language

- When presenting the reasons for a change, language that explains the benefits of the change (e.g., protecting wildlife, securing a reliable long-term supply) is received more positively than language emphasising the negative consequences of not making a change.

Tone of Voice

- As part of reassuring customers, it is important to give specific details about how any practical changes to supply, pricing, hardness and taste will or will not affect customers.
- Where a water source is unfamiliar there is a particular need to anticipate possible objections and neutrally address them.

Channel

- A letter, separate from the bill or an email, is seen as the most appropriate initial contact channel, depending on how close to the water source change the communication may occur.
- Having more detailed information available on-demand is important to answer customer questions.

Timing

- Most household customers want to be first notified three to six months in advance of the change of source itself.
- Providing a reminder of an upcoming change closer to the time is valuable, and would supplement this. This could be an email reminder.

Messenger

- Water companies are seen as a logical key messenger on this topic.
- An external, neutral voice would be a beneficial addition to a website, to offer reassurance (e.g., Drinking Water Inspectorate) but customers do not ask for this unless prompted.

Customers have specific interests when it comes to the additional information that would be provided

Reservoirs

- **Location** / where the reservoirs are going to be located is a common concern not mentioned within the text. Although this would not have been possible for this test, it will be important to include in future communications.
- Beyond this, customers commonly just ask for more information on the **changes in taste and hardness** specifically.

Water Recycling

- For recycled water the mention of **wastewater** in the texts raises **concerns** amongst a minority of respondents. (Although for others it sounds like a positive, sustainable option) and prompts a desire for more information on **safety.**
- **Taste and hardness** are common concerns across all sources when customers are told they may change, but particularly a concern raised about recycled water in the human/practical frames.

Desalination

- **Price** is particularly mentioned as a spontaneous area for more information in relation to desalination, especially in the environmental frame where price is not mentioned.
- Some respondents mention **taste** as an area of spontaneous concern for Desalinated water, with a misconception that desalinated water may have a “salty taste”, reflecting the low level of customer understanding.

Verbatim analysis: All respondents HH (n=1762), NHH (n=198)

WHAT THIS MEANS:

The human frame provides customers with the most information and performs best across customer groups	While both the human and environmental frames performed strongly with household customers in the quantitative research, the human framing is overall the preferred framing as it best marries the findings of the qualitative and quantitative research together, and best reflects the specific concerns that customers raise about individual sources
The most important information to land in communication about water source change is clear information on customer impacts	Customers are **most concerned about the personal impacts of water source change** and the effect this will have on their water supply in terms of hardness, taste and the impact on their bills. Giving clear information about what will and will not change in relation to these human impacts is the most important aspect of communication around a water source change.
Simple communications at regular time periods provide the reassurance and information customers want	Customers are looking for reassuring information presented in a time frame that allows them to react to the change and seek out more information themselves if they wish. Simple communications formats such as letters and emails that are familiar ways of interacting with a water company are likely to be most successful in meeting customer expectations.

The following sections outline attitudes towards specific water source options in detail, with implications for source-specific communications outlined

Water Recycling

Overall, key concerns for Water Recycling centre on safety, quality and the environment

Safety

Aspects of the recycling process can **raise safety and hygiene concerns** e.g. the use of wastewater ('yuck' factor) and chemicals involved.

> *I'm wary of chemicals, and if it is sewers, then I immediately think will they be using chemicals?*
>
> Household customer, London

Quality

Connected to the impact on safety, customers worry that recycling will **noticeably impact** the water they receive 'out of their tap' e.g., taste, smell, appearance.

> *I don't like the idea of it. It just seems dirty.*
>
> Household customer, Norwich

Environment

Customers are concerned about the impact of the recycling process on **natural environments and local areas** e.g. smell from recycling plants, chemical damage to wildlife and habitats.

> *I can't see how it's useful for us, if it's bad for the environment and uses chemicals.*
>
> Household customer, Norwich

Despite different 'starting points', attitudes towards Water Recycling at the end of the research are still largely negative

*Attitudes at **start** of research (uninformed)*

Water Recycling / Reuse

*Attitudes at **end** of research (informed)*

Most common 'starting points'

'Yuck' factor dominates *(majority of participants)*	Information about **chemical** processing and use of **wastewater** remain concerning	**Product testing** of sample representative of Recycled Water* (surprisingly) has **little impact on attitudes**, with many noticing a slight (unpleasant) difference in taste, described by some as 'chemical'.
Feel **neutral / indifferent** about it (often know it is currently used widely)	Information about **chemical** processing and **environmental** impact become concerning	
'Recycling' carries **positive** environmental associations	Information about **environmental** impact counters previous assumptions	

Water Recycling is most consistently **ranked lowest** overall amongst the other water source options.

Product sample tested: **Denge WTW:** Reverse Osmosis water representative of the kind of process that may be used in future water recycling schemes or desalination schemes

It can be difficult for customers to overcome psychological barriers around Water Recycling

The majority of customers are initially uncomfortable with the notion of Water Recycling, largely driven by hygiene and safety concerns.

- These concerns centre on the involvement of 'wastewater' or 'sewage' in the recycling process - and the potential impact of this on safety and quality.
- Customers worry that this will contaminate the water, and even if they believe that regulation and safety checks are in place, they simply 'don't like the idea' of waste being involved in the process.
- For most, the 'yuck' factor associated with perceptions of 'recycling' water is difficult to put aside.

When tasting a **product sample** that reflects the type of water that might be produced from this source option, customers are surprised that the sample looks the same as their 'normal' water – and whilst some reported a slight difference, this was split between positive and negative, and all agreed they could adapt to the change. However, this does little to shift the ingrained 'yuck' factor, even when the product is revealed.

> *The idea of it makes me feel sick.*
>
> Household customer, Norwich

> *Some people might wonder if it is as good as the real stuff.*
>
> Household customer, Peterborough

However, a small minority of customers do feel more neutral about this source

A minority of customers have an awareness – or expectation – that a form of water 'reuse' is currently involved in the UK water supply.

- This is particularly expected in more densely populated areas, such as London, where it is assumed that tap water has been 'reused' and treated to some extent.
- In light of this, the absence of customer experience issues (e.g., changes to taste, smell, appearance) and public health issues or contamination is reassuring.

These customers generally feel more open to Water Recycling, and the **product sample** tasting reaffirms this due to the lack of noticeable differences in the sample compared with their 'normal' tap water.

> *I think it's so subtle. I just think if you drink it, you wouldn't notice. It's only because we are dissecting it that we're thinking this.*
>
> Household customer, London

'Recycling' can carry positive environmental associations for a minority of customers

A minority of customers instinctively respond positively to the term 'recycling', associating it with other 'environmentally friendly' behaviours that they are familiar with in their day-to-day lives.

- Although quantitatively environmental concern is consistent across age ranges, younger customers are more likely to raise the environment spontaneously in qualitative sessions. They are therefore more likely to make this positive initial association.
- However, these perceptions can be countered when customers learn more about the chemicals involved in the recycling process, and the potential for environmental damage – with the impact on wildlife and natural environments particularly concerning.

> *Recycling is usually considered something positive, but it… has a negative environmental impact.*
>
> Household customer, London

> *It's a reliable source and allows the reuse of a resource that would otherwise be lost – I want to like it and I feel a little bit let down, the habitat impact affected me.*
>
> Household customer, Peterborough

Responses to the communication framings reflect concerns about quality and safety raised in the qualitative research

Environmental | **Human** | **Practical**

Across **all** three framings, customers respond positively to:
- Mentions of protecting **wildlife and the environment.**
- **Reassurances** of regulation and quality standards.

Across the **human** and **practical** framings, customers respond more negatively to:
- The **principle of moving to recycled water,** indicating an instinctive resistance or 'yuck factor'.
- The prospect of **changes to taste and hardness** of their water.

> *The standard required would force the water companies to produce great water.*
>
> Household customer, Quantitative survey

What this means

Positive environmental impacts of moving to Water Recycling can help to increase appeal, while safety and quality reassurances must be included in communications to help overcome 'yuck factor'.

Verbatim analysis: All respondents HH (n=1762), NHH (n=198)

Examples of each framing: Water Recycling

Environmental

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will ensure you continue to have a long-term reliable supply of water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available. This is because of increased demand from our growing population and the effects of climate change on our water supply.

Your current water source is from chalk streams or underground chalk aquifers. We need to preserve this source by limiting how much water we can take from it to protect our wildlife and our environment.

To ensure a long-term reliable supply of water, your new water source will be from recycled water.

Water recycling is a highly regulated process already used widely across the world. Wastewater is treated to extremely high standards to enable it to be safely used again as drinking water.

What happens next?

You do not need to do anything. If you would like to find out more about your water source and why it is changing, please visit www.watersourcechange.co.uk

How can you help?

We can all contribute towards a long-term reliable supply of water by being more water-efficient. This can be as simple as turning off the taps when we brush our teeth, reporting leaks and taking more showers and fewer baths. For more information on how to be water efficient, please visit www.waterefficency.co.uk.

The environmental framing is received positively, though the explanation of demand is less compelling

- >20% Net likeability (like-dislike)
- >10% Net likeability (like-dislike)
- >0% Net likeability (like-dislike)
- =/<0% Net likeability (like-dislike)
- >-20% Net likeability (like-dislike)

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will ensure you continue to have a long-term reliable supply of water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available. This is because of increased demand from our growing population and the effects of climate change on our water supply.

Your current water source is from chalk streams or underground chalk aquifers. We need to preserve this source by limiting how much water we can take from it to protect our wildlife and our environment.

To ensure a long-term reliable supply of water, your new water source will be from recycled water.

Water recycling is a highly regulated process already used widely across the world. Wastewater is treated to extremely high standards to enable it to be safely used again as drinking water.

What happens next?

You do not need to do anything. If you would like to find out more about your water source and why it is changing, please visit www.watersourcechange.co.uk

How can you help?

We can all contribute towards a long-term reliable supply of water by being more water efficient. This can be as simple as turning off the taps when we brush our teeth, reporting leaks and taking more showers and fewer baths. For more information on how to be water efficient, please visit www.waterefficency.co.uk.

Speaking about demand is challenging for customers, but the reasoning of population and climate change is disliked less than the initial fact (14%/13% vs 23% dislike).

Mentions of chalk streams and chalk aquifers are received more neutrally.

Mentions of protecting both wildlife and the environment are well liked.

Information on next steps and direction to further content is received positively.

S5 Please read the following letter, which sets out a hypothetical future change in the supply of the water. When you have finished reading it, please show us which parts you like or dislike by clicking
Base: All respondents seeing recycling, HH (n=605)

Examples of each framing: Water Recycling

Human

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water. The only change you may notice is a slight difference in taste and the 'hardness' of your water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available.

To ensure we provide you with a secure long-term supply of water, your new water source will be from recycled water. Water recycling is a highly regulated process already used widely across the UK. Wastewater is treated to extremely high standards to enable it to be safely used again as drinking water.

Please be assured that the quality and safety of your water will remain the same and you will not experience any disruption to your water supply or need to take any action.

What happens next?

We will remind you of the change to your water source by text message a few days before the 1 September.
If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

How can you help?

We can all contribute towards a long-term reliable supply of water by being more water-efficient. This can be as simple as turning off the taps when we brush our teeth, reporting leaks and taking more showers and fewer baths. For more information on how to be water efficient, please visit www.waterefficency.co.uk.

In the human framing, customers are most positive about reassurances of quality and safety

>20% Net likeability (like-dislike)

>10% Net likeability (like-dislike)

>0% Net likeability (like-dislike)

=/<0% Net likeability (like-dislike)

>-20% Net likeability (like-dislike)

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water. The only change you may notice is a slight difference in taste and the 'hardness' of your water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available.

To ensure we provide you with a secure long-term supply of water, your new water source will be from recycled water. Water recycling is a highly regulated process already used widely across the UK. Wastewater is treated to extremely high standards to enable it to be safely used again as drinking water.

Please be assured that the quality and safety of your water will remain the same and you will not experience any disruption to your water supply or need to take any action.

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If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

How can you help?

We can all contribute towards a long-term reliable supply of water by being more water efficient. This can be as simple as turning off the taps when we brush our teeth, reporting leaks and taking more showers and fewer baths. For more information on how to be water efficient, please visit www.waterefficency.co.uk.

Customers respond positively to assurances that their water bills, quality and pressure will not be affected by the change.

By contrast, they are much more negative about the suggestion of noticeable changes to the characteristics of their water, with 37% disliking this statement.

Customers are less positive about the fact that they will be moving to recycled water.

However, information about regulatory processes is received more positively, and assurances of quality and safety are particularly well received.

S5 Please read the following letter, which sets out a hypothetical future change in the supply of the water. When you have finished reading it, please show us which parts you like or dislike by clicking
Base: All respondents seeing recycling, HH (n=605)

Britainthinks
Insight & Strategy

Examples of each framing: Water Recycling

Practical

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water.

Your new water source will be from recycled water. You will not experience any disruption to your water supply or need to take any action.

The only change you may notice is a slight difference in taste and the 'hardness' of your water.

What happens next?

We will remind you of the change to your water source by text message a few days before the 1 September.

If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

Though in the practical framing, customers are most resistant to the prospect of changes to taste and hardness

- >20% Net likeability (like-dislike)
- >10% Net likeability (like-dislike)
- >0% Net likeability (like-dislike)
- =/<0% Net likeability (like-dislike)
- >-20% Net likeability (like-dislike)

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water.

Your new water source will be from recycled water. You will not experience any disruption to your water supply or need to take any action.

The only change you may notice is a slight difference in taste and the 'hardness' of your water.

What happens next?

We will remind you of the change to your water source by text message a few days before the 1 September.

If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

Customers are less positive about the prospect of their water changing to a recycled source, with a net likeability of6 %.

Reassurance about what will *not* change is more positively received (35% likeability).

The indication that taste and hardness may change prompts concern – 51% of customers dislike this statement.

S5 Please read the following letter, which sets out a hypothetical future change in the supply of the water. When you have finished reading it, please show us which parts you like or dislike by clicking
Base: All respondents seeing recycling, HH (n=605)

Concerns and watchouts for communicating source change to Water Recycling

What works well

- Customers appreciate the clear steer that recycled water is safe to drink.
- In general, the human and environmental frames are seen to give a good amount of information in a clear fashion. Customers presented with the human frame do not spontaneously ask for more environmental information.
- The tone of each communication is generally seen as reassuring, and it was important that supply is unchanged.

Watch outs and additional information to consider

- A significant number of customers want to know more about the recycled water process across all of the frames. Water companies should therefore consider including a weblink to an online explainer that goes into more details specifically about the recycling process and reassurance that they are not “drinking sewage”.
- When told that the hardness of their water may change, this is frequently cited as a concern by respondents, and more information on whether the water would be harder or softer is important. Customers are also concerned about possible changes to taste for recycled water.
- The practical frame in particular is seen as lacking detail for recycled water.

Verbatim analysis: All respondents HH (n=1762), NHH (n=198)

Water Recycling | Key implications for communications

WHO

- ✓ **Water companies** are seen as a logical key messenger on this topic.
- ✓ **References to 'quality control' processes** (e.g. high standards) offer reassurances of safety and the implicit involvement of a regulatory body / appropriate safety protocols.
- ✗ **Specific external voices**, such as Public Health bodies or Regulators, should be mentioned with care as these can actually raise alarm.

WHAT

- ✓ **Offer reassurances,** particularly in relation to drinking water, to address poor safety perceptions.
- ✓ **Reiterate that water reuse is commonplace** across the UK, in order to help to normalise this source option.
- ✗ **Avoid detail** on unfamiliar and technical processes as these can be confusing, and can in fact raise further questions or concerns.

HOW

- ✓ **Adopt a calm tone of voice**, communicating in a 'neutral' manner to help convey a sense of calm and 'business as usual'.
- ✗ **Avoid alarming language**, such as terms more easily associated with 'unsafe' aspects should be avoided, such as:
  - Sewage
  - Waste
  - Industrial products
  - Chemicals

WHERE

- ✓ **Keep initial contact concise**, with shorter pieces of information working well for direct communications.
- ✓ **Direct customers elsewhere** for further, more detailed, additional information (e.g. weblink, contact numbers).
- ✓ **Streamline communication**, providing updates on source changes alongside other forms of direct contact to increase the opportunity of cutting through (e.g. emails, bills).

WHEN

- ✓ **Communicate sooner** to the time that the change will occur if local construction works are planned (e.g. building a recycling plant in customers' local area).
- ✓ **Provide a timeline** of future key communication points if a large-scale local construction is planned, in order to offer a sense of consistency and clarity to the project.

Desalination

Key concerns for Desalination relate to its comprehension, environmental impact and safety

Comprehension

Customers are unfamiliar with desalination, so **descriptions can cause confusion** when technical language is used.

> *It's hard to make an informed decision about this*
>
> Household customer, Norwich

Environment

Customers are concerned about the **negative environmental impacts on coastal and marine wildlife,** caused by the heavy infrastructure and by-products produced through the process.

> *I do wonder about the sea life and how their managing*
>
> Household customer, Southampton

Safety

Related to the limited comprehension, customers feel **apprehensive about the high use of chemicals**, which they fear will have impacts on the safety and taste of desalinated water.

> *Would we be able to get rid of all the salt? Otherwise there could be health issues.*
>
> Non-household customer, Peterborough

Although praised for it's reliability, Desalination is ultimately judged to only be suitable in emergency scenarios

*Attitudes at **start** of research (uninformed)* → **Desalination** → *Attitudes at **end** of research (informed)*

Most common 'starting points'

- Feel **neutral / indifferent** about it (unknown water source)
- Highly reliable as an **'infinite' source of water,** and therefore accepted
- Concerns about **negative environmental impacts**

- Information about it **use elsewhere** makes it feel less suited to the UK
- Information about the **intense process** increases concerns about its use
- Information about **chemicals, emissions and by-products** remains concerning

Product testing of sample representative of Desalination (surprisingly) has **little impact on attitudes**, with many noticing a slight (unpleasant) difference in taste, described by some as 'chemical'.

Desalination is often **ranked among the lowest** source options, though is deemed suitable for emergencies/ as a last resort.

Product sample tested: **Denge WTW:** Reverse Osmosis water representative of the kind of process that may be used in future water recycling schemes or desalination schemes

Feel **neutral / indifferent** about it (unknown water source)

Existing knowledge of Desalination is limited, but learning more can make it seem more suitable in arid climates

Few participants knew of Desalination before the start of the research.

- For some, the use of desalination in other countries builds support for Desalination as a 'tried and tested' solution to water scarcity.
- However, where there is awareness, Desalination is often associated with other countries with drier climates than the UK e.g. Canary Islands, the Middle East.
    - This can mean suggestions that Desalination is built in the UK seem like 'overkill', with a preference for other solutions to be implemented first.

> *I've never heard of it before, possibly because it is not widely used in the UK. I have been to Indonesia and saw desalination happening there.*
>
> Non-household customer, Peterborough

The premise of Desalination is considered a 'common sense' option, but the intense process counters this assumption

Many initially feel Desalination is a logical solution to water shortage as the sea is a reliable water source, and the UK has a long coastline from which to extract seawater.

- However, learning about the high monetary and energy costs of the process raises concerns about relying on Desalination.
  - This information makes Desalination feel inefficient and more harmful than assumed.
- The need to build more infrastructure to transport Desalinated water to non-coastal water-stressed areas further adds to concerns about inefficiency.
- Despite this, participants continue to support it as a backup solution due to its reliability and flexibility, particularly during times of drought.

The **product sample** tasting reaffirms the suitability of Desalination during a time of drought - whilst some reported a slight difference in taste, this was not necessarily all negative, and all agreed they could adapt to the change.

> *It's beneficial if it's only used at certain times in the year like a drought, it's almost like an emergency supply.*
>
> Household customer, London

Others express immediate concern about environmental impacts, which expand after learning more about the process

Disruption to coastal and marine wildlife is top-of-mind for other participants, who are concerned Desalination will cause irreversible harm to local ecosystems.

- There is an assumption sea life will be killed when extracting water.
  - This is seemingly confirmed after learning more, as well as when brine is released back into the environment.
- Learning more about the environmental impacts, including high carbon emissions, further confirm participant fears and increase concerns of those who previously view this option as a 'common sense' solution.
- Some suggest Desalination may become more suitable in the future if it was made more environmentally friendly though:
  - Re-purposing waste products (e.g., using salt to grit roads).
  - Powering the process with renewable energy.

> *I know we eat sea life but I don't want it to become extinct.*
>
> Household customer, Southampton

> *It worries me about the effect on the coastal wildlife. [We] won't run out of the sea - but when you look at some of the others, this not good for resiliency and energy use*
>
> Non-household customer, Southampton

Responses to the communications framings reflect the impact that comprehension has on appeal

Environmental | **Human** | **Practical**

Across **all** framings, customers responded positively to:
- Reassurances that the environment, and their bills would not be impacted.

Across **all** framings, customers respond more negatively to:
- The principle of Desalination and explanations of the process, with verbatim indicating widespread misconceptions about the impact on taste e.g., it will be 'salty' water.

> *Desalinated water always tastes salty.*
>
> Household customer, Quantitative survey

What this means

While it is important to provide a concise explanation of the process in order to aid understanding, this can also raise alarm – particularly in relation to the impact of the Desalination process on taste.

Verbatim analysis: All respondents HH (n=1762), NHH (n=198)

Examples of each framing: Desalination

Environmental

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will ensure you continue to have a long-term reliable supply of water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available. This is because of increased demand from our growing population and the effects of climate change on our water supply.

Your current water source is from chalk streams or underground chalk aquifers. We need to preserve this source by limiting how much water we can take from it to protect our wildlife and our environment.

To ensure a long-term reliable supply of water, your new water source will be from desalinated water.

Water desalination is the highly regulated process of taking sea water and treating it to extremely high standards, including removing the salt, so it can be used safely as drinking water.

What happens next?

You do not need to do anything. If you would like to find out more about your water source and why it is changing, please visit www.watersourcechange.co.uk

How can you help?

We can all contribute towards a long-term reliable supply of water by being more water-efficient. This can be as simple as turning off the taps when we brush our teeth, reporting leaks and taking more showers and fewer baths. For more information on how to be water efficient, please visit www.waterefficency.co.uk.

In the environmental framing, the protection of the environment is liked, but the information on demand disliked

- >20% Net likeability (like-dislike)
- >10% Net likeability (like-dislike)
- >0% Net likeability (like-dislike)
- =/<0% Net likeability (like-dislike)
- >-20% Net likeability (like-dislike)

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will ensure you continue to have a long-term reliable supply of water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available. This is because of increased demand from our growing population and the effects of climate change on our water supply.

Your current water source is from chalk streams or underground chalk aquifers. We need to preserve this source by limiting how much water we can take from it to protect our wildlife and our environment.

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As with the other source options, speaking about demand is challenging for customers.

Mentions of chalk streams and chalk aquifers are received more neutrally.

Mentions of both wildlife and the environment are well liked.

Explanations of the desalination process are less positively received, although still liked 9% more than disliked.

S5 Please read the following letter, which sets out a hypothetical future change in the supply of the water. When you have finished reading it, please show us which parts you like or dislike by clicking
Base: All respondents seeing desalination, HH (n=552)

Examples of each framing: Desalination

Human

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water. The only change you may notice is a slight difference in taste and the 'hardness' of your water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available.

To ensure we provide you with a secure long-term supply of water, your new water source will be from desalinated water. Water desalination is the highly regulated process of taking sea water and treating it to extremely high standards, including removing the salt, so it can be used safely as drinking water.

Please be assured that the quality and safety of your water will remain the same and you will not experience any disruption to your water supply or need to take any action.

What happens next?

We will remind you of the change to your water source by text message a few days before the 1 September.

If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

How can you help?

We can all contribute towards a long-term reliable supply of water by being more water-efficient. This can be as simple as turning off the taps when we brush our teeth, reporting leaks and taking more showers and fewer baths. For more information on how to be water efficient, please visit www.waterefficency.co.uk.

Explanations of the Desalination process are less liked in the human framing, though reassurances of safety are positive

- >20% Net likeability (like-dislike)
- >10% Net likeability (like-dislike)
- >0% Net likeability (like-dislike)
- =/<0% Net likeability (like-dislike)
- >-20% Net likeability (like-dislike)

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water. The only change you may notice is a slight difference in taste and the 'hardness' of your water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available.

To ensure we provide you with a secure long-term supply of water, your new water source will be from desalinated water. Water desalination is the highly regulated process of taking sea water and treating it to extremely high standards, including removing the salt, so it can be used safely as drinking water.

Please be assured that the quality and safety of your water will remain the same and you will not experience any disruption to your water supply or need to take any action.

What happens next?

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If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

How can you help?

We can all contribute towards a long-term reliable supply of water by being more water efficient. This can be as simple as turning off the taps when we brush our teeth, reporting leaks and taking more showers and fewer baths. For more information on how to be water efficient, please visit www.waterefficency.co.uk.

Customers respond positively to assurances that their water bills, quality and pressure will not be affected by the change.

By contrast, they are much more negative about the suggestion of noticeable changes to the characteristics of their water.

Descriptions of the desalination process are less positively received, reflecting comprehension issues encountered in the qualitative research.

Reassurances that quality and safety will be maintained are positively received.

S5 Please read the following letter, which sets out a hypothetical future change in the supply of the water. When you have finished reading it, please show us which parts you like or dislike by clicking
Base: All respondents seeing desalination, HH (n=552)

Examples of each framing: Desalination

Practical

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water.

Your new water source will be from desalinated water. You will not experience any disruption to your water supply or need to take any action.

The only change you may notice is a slight difference in taste and the 'hardness' of your water.

What happens next?

We will remind you of the change to your water source by text message a few days before the 1 September.

If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

In the practical framing, customers respond most negatively to the prospect of taste and hardness changing

- >20% Net likeability (like-dislike)
- >10% Net likeability (like-dislike)
- >0% Net likeability (like-dislike)
- =/<0% Net likeability (like-dislike)
- >-20% Net likeability (like-dislike)

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water.

Your new water source will be from desalinated water. You will not experience any disruption to your water supply or need to take any action.

The only change you may notice is a slight difference in taste and the 'hardness' of your water.

What happens next?

We will remind you of the change to your water source by text message a few days before the 1 September.

If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

Customers are slightly negative about the prospect of their water changing to a desalinated source in this framing (-2% net)

Reassurance about what will *not* change is positively received, with 32% liking this statement.

The indication that taste and hardness may change lacks prompts concern – 51% of customers dislike this statement.

S5 Please read the following letter, which sets out a hypothetical future change in the supply of the water. When you have finished reading it, please show us which parts you like or dislike by clicking
Base: All respondents seeing desalination, HH (n=552)

Concerns and watch-outs for communicating source change to Desalination

What works well

- The feedback on the Desalination process is mixed overall; while some customers are positive about it, a number of customers echo feedback from qualitative sessions about the solution **being more suited to other regions of the world.**
- The communications are generally seen to be simple and **to the point.**

Watch-outs and additional information to consider

- There are particular concerns about **taste**, with some customers worrying that desalinated water would taste “salty” in some way and taste different from water from freshwater sources.
- **Price** is particularly mentioned as a spontaneous area for more information in relation to Desalination, especially in the environmental frame where the price is not mentioned.
- For the non-environmental frames, a few customers express concern that Desalination might have an **ecological impact**. For the environmental frame, the cost was a significant unaddressed concern.

Verbatim analysis: All respondents HH (n=1762), NHH (n=198)

Desalination | Key implications for communications

WHO

- **Water companies** are seen as a logical key messenger on this topic.
- **Local authorities** however should be used in relation to the construction of a desalination for customers likely to be impacted.

WHAT

- **Give a clear description of the process and why its been chosen,** to overcome comprehension barriers.
- **Emphasise the reliability and longevity** of the water source.
- **Provide reassurances on the taste,** highlighting that there will be no noticeable change from customer's current source.
- **Address concerns directly,** being transparent about negative environmental impacts and sharing ways these will be offset, and explaining how salt is disposed of.

HOW

- **Use a reassuring but factual tone of voice,** so as not to drive any new concerns.
- **Avoid language that is overly technical in nature,** particularly in describing the process of desalination and the disposal of salt.

WHERE

- **Keep initial contact concise**, with shorter pieces of information working well for direct communications.
- **Direct customers elsewhere** for further, more detailed, additional information (e.g. weblink, contact numbers).
- **Streamline communication**, providing updates on source changes alongside other forms of direct contact to increase the opportunity of cutting through (e.g. emails, bills).

WHEN

- **Communicate sooner** to the time that the change will occur if local construction works are planned (e.g. building a desalination plant in customers' local area).
- **Provide a timeline** of future key communication points if a large-scale local construction is planned, in order to offer a sense of consistency and clarity to the project.

Water Transfer

Concerns for Water Transfer stem from comprehension issues and worries about quality and the environmental impact

Comprehension

Many customers struggle to understand the logistics and infrastructure required for Water Transfer and so find the specifics difficult to grasp.

> *I'd want to know how it's processed and transported.*
>
> Household customer, Southampton

Quality

Customers have some sense that the taste or characteristics of their water may change if it is coming from a different area of the country, and worry that this water will be 'worse' in quality.

> *You have to [get the water] and treat it [after transfer], otherwise there may be issues of contamination.*
>
> Household customer, Peterborough

Environment

Customers are concerned that environmental impacts, such as the potential disruption of natural habitats, will be managed.

> *There is an issue of animals living in the canals used for the transfer.*
>
> Household customer, London

Customers largely feel neutral about Water Transfer, though comprehension can hinder appeal for some

*Attitudes at **start** of research (uninformed)* → **Water Transfer** → *Attitudes at **end** of research (informed)*

Most common 'starting points'

- The principle of a 'grid' to transfer water where its needed feels **logical and efficient**
- **Confused** about infrastructure requirements and potential disruption

- Explanation that water is plentiful in some areas of the country but scarce in others **makes sense** intuitively
- Information about potential disruption of natural environments **adds to concern** about infrastructure

Product testing of sample representative of Water Transfer has **little impact on attitudes**, with very few customers noticing any difference in taste from their current water supply, or any notable characteristics.

Customers feel most **neutral** overall about Water Transfer, compared with other source options, and it is often ranked relatively high.

Product sample tested: **Hampton WTW Water:** Representative of large "water transfer" schemes & **Sundon WTW:** Conditioned water representative of the proposed Anglian region to Affinity water transfer

Water Transfer is largely felt to be a logical solution to water shortage issues

Most feel that the principle of transferring water from areas of abundance to areas of scarcity ‘makes sense’, and assume that this system is already in place in the UK.

- However, there are some concerns that arise when customers learn about the potential for contamination during the transfer process.
  - These concerns are also reinforced by the idea that water coming from other areas might be ‘worse’ than that which people are used to i.e. in quality or characteristics such as hardness.
- A minority of customers living in areas that are perceived as less water-stressed (e.g. rural areas outside London) have hesitations about sending ‘their water’ elsewhere.
- Despite this, Water Transfer is largely considered a sensible option.

The **product sample** tasting reassures customers that water transferred from other areas will not necessarily taste noticeably different from what they are used to.

> *Apparently some parts of the UK already use this, but I think it needs to be used more if needed. It feels like it would be an obvious [solution].*
>
> Household customer, Peterborough

However, confusion about logistics and infrastructure requirements can lead to some concerns

For the majority of customers, there is a particular lack of clarity around:

- Infrastructure requirements – it is unclear what type of infrastructure will be involved (e.g., canals, pipes, rivers) and how much new infrastructure will be required.
    - This also makes it difficult to estimate the disruptive impact that Water Transfer might have on local areas and natural environments.
- Funding and cost – it is unclear who will be responsible for paying for different parts of the schemes if they cross over regions supplied by different water companies.
- While these areas of confusion do not necessarily raise significant alarm, they can make it difficult for customers to engage meaningfully with this source option, leading them to remain neutral in their attitude.

> *Will we be told where the water comes from?*
>
> Non-household customer, Peterborough

> *Who will pay the cost of transport?*
>
> Household customer, Peterborough

Water Transfer | Key implications for communications

WHO

- **Water companies** are seen as a logical key messenger on this topic.

WHAT

- **Provide a clear description of how the process works,** in terms of the infrastructure required for transfers and when/how water is treated.
- **Give reassurances on taste and quality,** reiterating that customers will not experience a noticeable change.
- **Address environmental concerns directly,** reassuring of ways they can be addressed and managed.

HOW

- **Adopt a factual, 'business as usual' tone,** to avoid raising any new concerns regarding the change.
- **Avoid emphasising that water will be from a 'different' location,** as this could drive concerns on taste and quality.

WHERE

- **Keep initial contact concise**, with shorter pieces of information working well for direct communications.
- **Direct customers elsewhere** for further, more detailed, additional information (e.g. weblink, contact numbers).
- **Streamline communication**, providing updates on source changes alongside other forms of direct contact to increase the opportunity of cutting through (e.g. emails, bills).

WHEN

- **Little upfront communication is required,** unless construction is required in local areas.

Reservoirs

Reservoirs raise concerns about the disruption caused as well as the associated costs and long lead time

Disruption

The need for large-scale construction raises concerns that local communities will face severe **disruption to their daily lives** for an extended period of time

Cost & Lead time

Customers worry about the reliability of reservoirs in drought situations (i.e., drying up), particularly due to the **high cost and lead time required before they become operational**.

> *I guess the fact that you are changing an ecosystem is quite a disruption.*
>
> Non-household customer, London

> *The only negative is that it disrupts communities and ecosystems, and it's not really cost-effective.*
>
> Household customer, London

> *It does depend on where you live. In a rural area with nice views you will be more opposed [to construction].*
>
> Household customer, Norwich

Positivity is driven by familiarity, the community and environmental benefits created and long-term reliability

*Attitudes at **start** of research (uninformed)*

Reservoir

*Attitudes at **end** of research (informed)*

Most common 'starting points'

- **Tried and tested water source** providing more 'natural' water
- Concerns about **disruption and costs** involved in construction
- Negative impacts for local wildlife

- Reinforced by info on **high quantities of water** they supply
- Info about **low operation cost and long term reliability**
- Create **positive environmental and community benefits**

No corresponding product testing.

Reservoirs are the **preferred supply-side solution**. However, there is a desire for water companies to take further action to address water scarcity while reservoirs are being built.

Familiarity with Reservoirs builds positivity, which increases when learning of the amount of additional water they provide

Reservoirs are well known and considered common across the UK, driving positive attitudes for its use as a 'tried and tested solution which makes good use of the UK's wet weather.

- Reservoirs are described by some as a more 'natural' source of water compared to other supply-side solutions as the water being stored is assumed to be precipitation.
  - Furthermore, this water is assumed to be of higher quality.
  - A small minority query how water in Reservoirs is kept clean, with some concern that high quantities of chemicals are needed, though this is not a pressing concern.
- Positive assumptions about Reservoir use as a solution are reinforced when presented with further information on the additional water they provide and the variety of customers they serve.

> *The idea of a reservoir makes a lot of sense. Ecologically, we have flat land and can pump water out from the reservoirs before the rivers get to a certain [low] level.*
>
> Household customer, Peterborough

Concerns about community disruption are somewhat offset by learning about the long-term reliability of Reservoirs

The disruption to daily life during the long construction period, as well as the costs required to build Reservoirs, leads to doubts about how worthwhile investment in a Reservoir is as a solution.

- There is a perception that Reservoirs are not as reliable as other supply-side options due to water loss from evaporation and an assumed reliance on rainfall. Therefore, there is concern that building a reservoir is not worth the large costs required for construction.
  - Some also question where funding would come from, and whether these costs would be passed onto customers.
- Learning about the low running costs and long-term reliability of Reservoirs once constructed increases acceptance of Reservoirs.
- However, there is a desire to know what water companies are doing in the interim to address water scarcity before new Reservoirs become operational.

> *When it's sunny and hot, the reservoirs dry up. So it seems like it's a waste of water.*
>
> Household customer, London

> *They take a while to build, so should be introduced first while other measures are rolled out while they're built.*
>
> Household customer, Norwich

Early concerns about damage to wildlife are offset by the ‘net-benefit’ Reservoirs deliver in addition to water supply

The large amounts of space required to build Reservoirs also raises concerns about the destruction of local habitats and damage to the environment.

- Learning about the creation of new habitats and green spaces in the construction of Reservoirs goes some way in addressing these concerns, leading to a perception that they have a ‘net-positive’ impact on the environment.
- Additional benefits (e.g., leisure spaces, education opportunities, aesthetic spaces) created through Reservoirs further build on this view of Reservoirs providing a net-benefit once constructed, furthering support.

> *You might have to knock something down, but then it can be used for fishing. So I think it’s good to add something to a town. I'd go to a reservoir because you can run around it and sea fishing, sailing, and get people to go outside.*

Non-household customer, London

Responses to the communications framings reflect the importance of minimising disruption

Environmental | **Human** | **Practical**

Across **all** framings, customers respond positively to:
- Reassurances that there will be little disruption and that the source will be reliable.

In the **human** and **practical** framings, reassurances that **bills** would not change are positively received.

However, customers respond negatively to suggestions that **taste** and **hardness** may be impacted.

> *As the letter has provided details of changes, no increase or disruption and also details and they have said we can be assured*
>
> Household customer, Quantitative survey

What this means

Given that customers have few concerns about this source option in principle (i.e. safety, quality), it will be important to lead with explaining what will *not* change in practice for customers.

Verbatim analysis: All respondents HH (n=1762), NHH (n=198)

Examples of each framing: Reservoirs

Environmental

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will ensure you continue to have a long-term reliable supply of water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available. This is because of increased demand from our growing population and the effects of climate change on our water supply.

Your current water source is from chalk streams or underground chalk aquifers. We need to preserve this source by limiting how much water we can take from it to protect our wildlife and our environment.

To ensure a long-term reliable supply of water, your new water source will be from a new reservoir.

Reservoirs provide a very reliable source of water. Water can be taken from rivers during the winter when it is in plentiful supply and stored so it can be used in drier periods.

What happens next?

You do not need to do anything. If you would like to find out more about your water source and why it is changing, please visit www.watersourcechange.co.uk

How can you help?

We can all contribute towards a long-term reliable supply of water by being more water-efficient. This can be as simple as turning off the taps when we brush our teeth, reporting leaks and taking more showers and fewer baths. For more information on how to be water efficient, please visit www.watereffiicency.co.uk

Respondents find the explanation of demand difficult, but the framing of reliability and preservation to be positive

- >20% Net likeability (like-dislike)
- >10% Net likeability (like-dislike)
- >0% Net likeability (like-dislike)
- =/<0% Net likeability (like-dislike)
- >-20% Net likeability (like-dislike)

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will ensure you continue to have a long-term reliable supply of water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available. This is because of increased demand from our growing population and the effects of climate change on our water supply.

Your current water source is from chalk streams or underground chalk aquifers. We need to preserve this source by limiting how much water we can take from it to protect our wildlife and our environment.

To ensure a long-term reliable supply of water, your new water source will be from a new reservoir.

Reservoirs provide a very reliable source of water. Water can be taken from rivers during the winter when it is in plentiful supply and stored so it can be used in drier periods.

What happens next?

You do not need to do anything. If you would like to find out more about your water source and why it is changing, please visit www.watersourcechange.co.uk

How can you help?

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Speaking about demand is challenging for customers, the more positive framing about protecting wildlife is more liked.

Mentions of both wildlife and the environment are well liked, however wildlife scores marginally higher (29% liked wildlife v 23% liked environment).

Practical advice and simple steps for efficiency are both well liked.

S5 Please read the following letter, which sets out a hypothetical future change in the supply of the water. When you have finished reading it, please show us which parts you like or dislike by clicking
Base: All respondents seeing reservoirs, HH (n=605)

Examples of each framing: Reservoirs

Human

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water. The only change you may notice is a slight difference in taste and the 'hardness' of your water.

Why do we need to change your water source?

Demand for water in your area, and across many areas in England, is getting close to the limit of how much water is available.

To ensure we provide you with a secure long-term supply of water, your new water source will be from a new reservoir. Reservoirs provide a very reliable, low-cost source of water. Water can be taken from rivers during the winter when it is in plentiful supply and stored so it can be used in drier periods.

Please be assured that the quality and safety of your water will remain the same and you will not experience any disruption to your water supply or need to take any action.

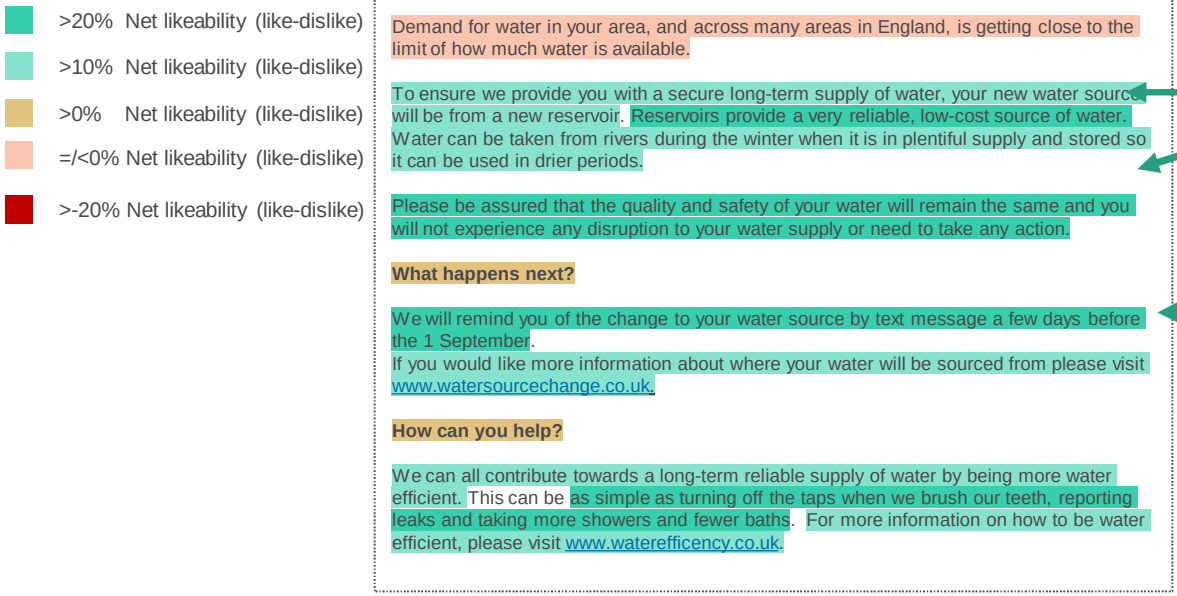
What happens next?

We will remind you of the change to your water source by text message a few days before the 1 September.
If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

How can you help?

We can all contribute towards a long-term reliable supply of water by being more water-efficient. This can be as simple as turning off the taps when we brush our teeth, reporting leaks and taking more showers and fewer baths. For more information on how to be water efficient, please visit www.waterefficency.co.uk.

Reassurance about what will *not* change is the most liked part of the practical framing



50% of respondents liked the reassurance about the change not affecting the bill, quality or pressure, the most liked paragraph in all 3 letters.

By contrast 41% of respondents disliked the possibility of a difference in hardness / taste, the most disliked paragraph of any framing.

Providing reassurance about the new source, and that it will be reliable and not cause disruption was liked by respondents.

Clarity that there will be a reminder is strongly liked.

S5 Please read the following letter, which sets out a hypothetical future change in the supply of the water. When you have finished reading it, please show us which parts you like or dislike by clicking
Base: All respondents seeing reservoirs, HH (n=605)

Examples of each framing: Reservoirs

Practical

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water.

Your new water source will be from a new reservoir. You will not experience any disruption to your water supply or need to take any action.

The only change you may notice is a slight difference in taste and the 'hardness' of your water.

What happens next?

We will remind you of the change to your water source by text message a few days before the 1 September.

If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

Similarly in the practical frame, the statement on differences in taste and hardness receives a negative response

- >20% Net likeability (like-dislike)
- >10% Net likeability (like-dislike)
- >0% Net likeability (like-dislike)
- =/<0% Net likeability (like-dislike)
- >-20% Net likeability (like-dislike)

Dear customer,

We want to let you know about a change in your water source due to take place on 1 September 2022. This will not affect your bill or the quality or pressure of your water and will ensure you continue to have a long-term reliable supply of water.

Your new water source will be from a new reservoir. You will not experience any disruption to your water supply or need to take any action.

The only change you may notice is a slight difference in taste and the 'hardness' of your water

What happens next?

We will remind you of the change to your water source by text message a few days before the 1 September.

If you would like more information about where your water will be sourced from please visit www.watersourcechange.co.uk.

Reassurance about what will *not* change is positively received.

The indication that taste and hardness may change lacks specificity, and prompts concerns.

Clarity that there will be a reminder is strongly liked.

S5 Please read the following letter, which sets out a hypothetical future change in the supply of the water. When you have finished reading it, please show us which parts you like or dislike by clicking
Base: All respondents seeing reservoirs, HH (n=605)

Concerns and watch-outs for communicating source change to Reservoirs

What works well

- Emphasising that the change would be minor and safe, and that customers would not see major changes to their supply, is cited as a positive.
- The fact there would be a reminder is also cited frequently as a positive aspect of the letter.

Watch-outs and additional information to consider

- There are occasional requests for more information on where the reservoir is located / going to be located.
- When told that the hardness of their water may change, this is frequently cited as a concern by respondents, who feel more information on the impact of this would be helpful.
- If an impact on bills is not mentioned, as in the environmental frame, customers commonly mention wanting information on this.

Verbatim analysis: All respondents HH (n=1762), NHH (n=198)

Reservoirs | Key implications for communications

WHO

- **Water companies** are seen as a logical key messenger on this topic.
- **Local authorities** are seen as important messengers in providing information and reassurances around planning and construction.
- **Open dialogue** will be necessary to manage likely strong pushback to the disruption that will be caused by the construction, and avenues for customers to voice their concerns should be provided.

WHAT

- **Reference the familiarity and common use** of reservoirs to reinforce perceptions that it is a 'tried and tested' solution.
- **Focus on the long-term reliability** of reservoirs to supply water for years to come, making it a worthwhile investment.
- **Highlight environmental benefits** for wildlife and habitats, which shape reservoirs as a 'net-environmental good'. The same applies to the creation of recreational activities through reservoirs, providing a net-good for communities.

HOW

- **High level information** is likely to be sufficient due to high familiarity with reservoirs as a way of supplying water

WHERE

- **Long term communications plans** are likely to be helpful, as presumed level of disruption mean customers expect comms via many channels over a long period of time, including various ways to voice their own concerns.

WHEN

- **Consistent and clear communications** will be necessary to manage concerns about local area disruption; transparent comms on when different stages are being implemented are important, including an overview of planning processes.

5 Key findings

Key findings

1. **Water is a low salience topic**, with customers indicating a low level of awareness and understanding of issues relating to it. This in part is driven by general satisfaction with the customer experience of water in terms of taste, smell and hardness.

2. **Customers also have low awareness of water scarcity**, and whilst all take steps not to 'waste' water, most are not actively trying to reduce their water consumption. Information on the topic is easily understood, however, this is not always enough in to unseat long-standing perceptions that water is abundant in the UK.

3. **Customers believe that water companies should be taking steps to respond to the issue of water scarcity now, and recognise that a mix of demand and supply-side solutions are required.** However, there is a general desire to see water companies implement demand-side options first, including fixing leaks and educating customers.

4. **When prompted, customers assess water source options by balancing efficacy (including reliability) and the cost and time commitments associated with the change.** There is also an expectation of water companies to evaluate options through this lens.

5. **Customers say they are unlikely to engage with communications on source change, and taste tests indicate that most are not able to detect differences at the level that might be expected in a source change.** However there is still a need to communicate to explain the rationale for the change, alleviate taste concerns and provide clear guidance on impact.

Key findings

6. **In terms of communication, overall the human frame best combines the qualitative and quantitative findings together.** Quantitatively environmental and human framings are slightly preferred to practical framings of a water source change, however in qualitative sessions environmental framing are felt to lack impact indicating that overall human is best.

7. **Most household customers want to be first notified three to six months in advance of the change, although non-household customers are more likely to want a closer notification of a change.** Most respondents then want to be reminded again of the change at a point closer to the time, but generally only once.

8. **E-mail and a letter separate from the water bill are the preferred forms of communication about source changes, consistent across sources.** The majority of customers claim they would click through to look at additional information. Whilst in reality this number may be lower, providing comprehensive information to those who may want it is key.

9. **Of those who are more inclined to visit a website for further detail on the change, there is an expectation that this would include a wealth of comprehensive information**. This includes detail on bills, taste, the process, the reason behind the change, safety, environmental impact and information from an independent source.

10. **Whilst there is a need to communicate on any source change, Water Recycling and Desalination in particular need more engagement due to a higher level of spontaneous concerns.** For Water Recycling these concerns are centred around taste, hygiene and safety. Desalination also generated concerns, which tended to be around taste and price

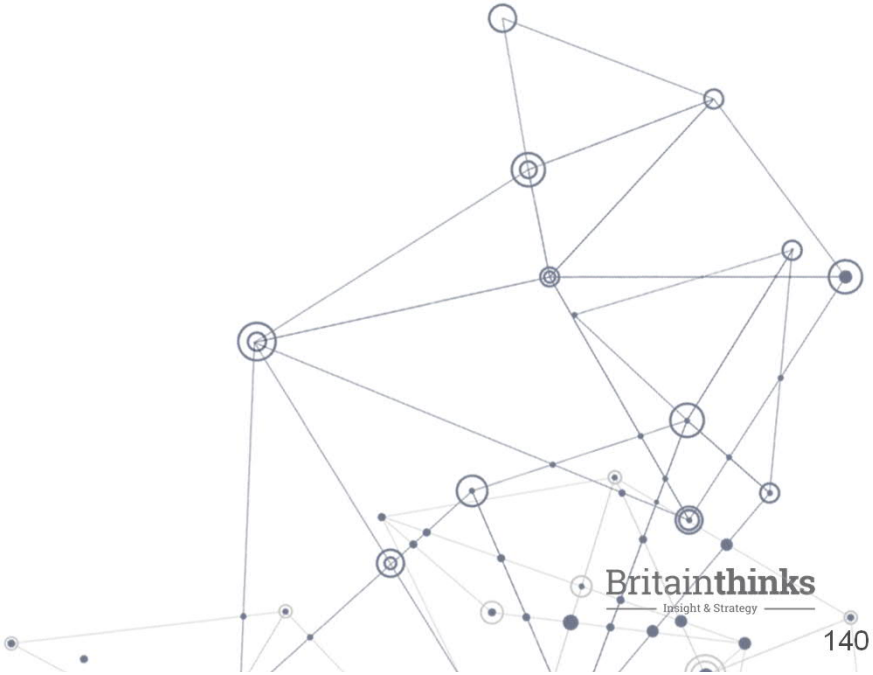
Key source-specific findings

WATER RECYCLING	Key concerns for Water Recycling centre on safety, quality and the environment, with many customers being particularly focused on the 'yuck' factor of the source which can be hard to overcome. In terms of communications, customers indicate an equal preference for either environmental or practical framings.
DESALINATION	Desalination is a less well-known and understood source compared to others. Although praised for its reliability, Desalination is ultimately judged to only be suitable in emergency scenarios given the 'intense' construction and running process. In terms of communications, customers indicate a preference for the human framing.
WATER TRANSFER	Concerns about Water Transfer stem from comprehension issues and worries about quality and the environmental impact, however, generally customers are favourable towards it as a source option, seeing it as a logical solution to regional water scarcity. Communications should address environmental and taste concerns directly.
RESERVOIRS	Reservoirs benefit from their familiarity in the UK, with attitudes being generally favourable to them. However, customers do raise concerns in terms of costs, lead times and the impact of construction. In terms of communications, customers indicate an equal preference for either environmental or practical framings.

Further outputs: Communications Framework

In addition to this report, a Communications Framework has been designed as an interactive document that can be used by communications teams as part of their development process.

This interactive ‘toolkit’ includes directional recommendations on ‘do’s and don’t’s’ when communicating specific source changes, based on the findings included in this full research report, as well as interactive activities and stimuli for workshops.

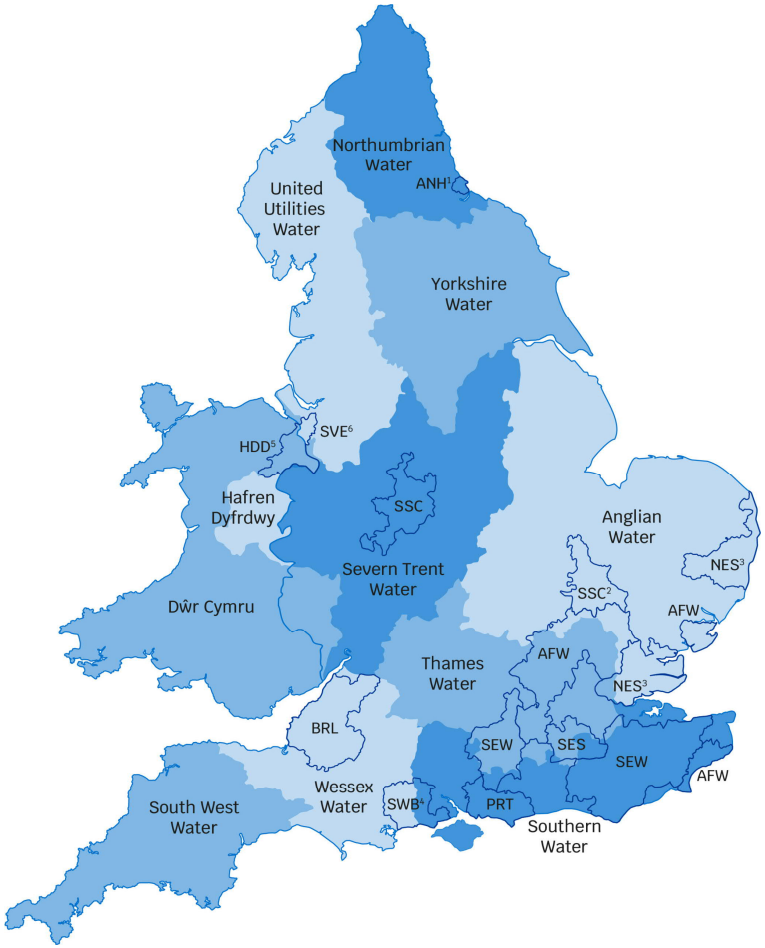


Appendix

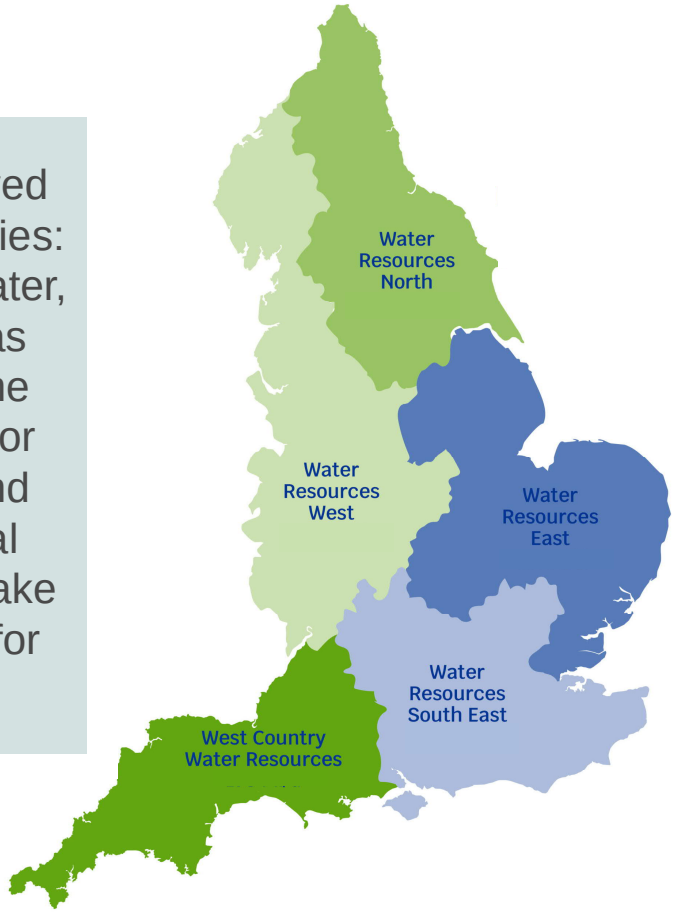
1 Qualitative research

Research materials shown as part of the deliberative workshops

THE WATER INDUSTRY TODAY



England and Wales are served by 20 different water companies: some provide just drinking water, others take away sewage as well. Companies in the same area work together to plan for the future in their region, and work with the other regional groups across England to make sure there is enough water for everyone.



THE WATER INDUSTRY TODAY

Water companies

- Take water from the environment and treat it so it's safe to drink
- Build and maintain infrastructure (like pipes) to supply water to homes and businesses

Environment Agency

- Protects and enhances the environment
- Works with water companies to ensure operations and plans develop in a sustainable way

Drinking Water Inspectorate (DWI)

- Makes sure the water supplied in England and Wales is safe and that drinking water quality is acceptable for customers

There are a number of different players in the water industry who serve **water customers** to ensure the water supplied is safe, reliable and environmentally friendly.

Defra

- The UK Government department responsible for protecting the environment and countryside, including water

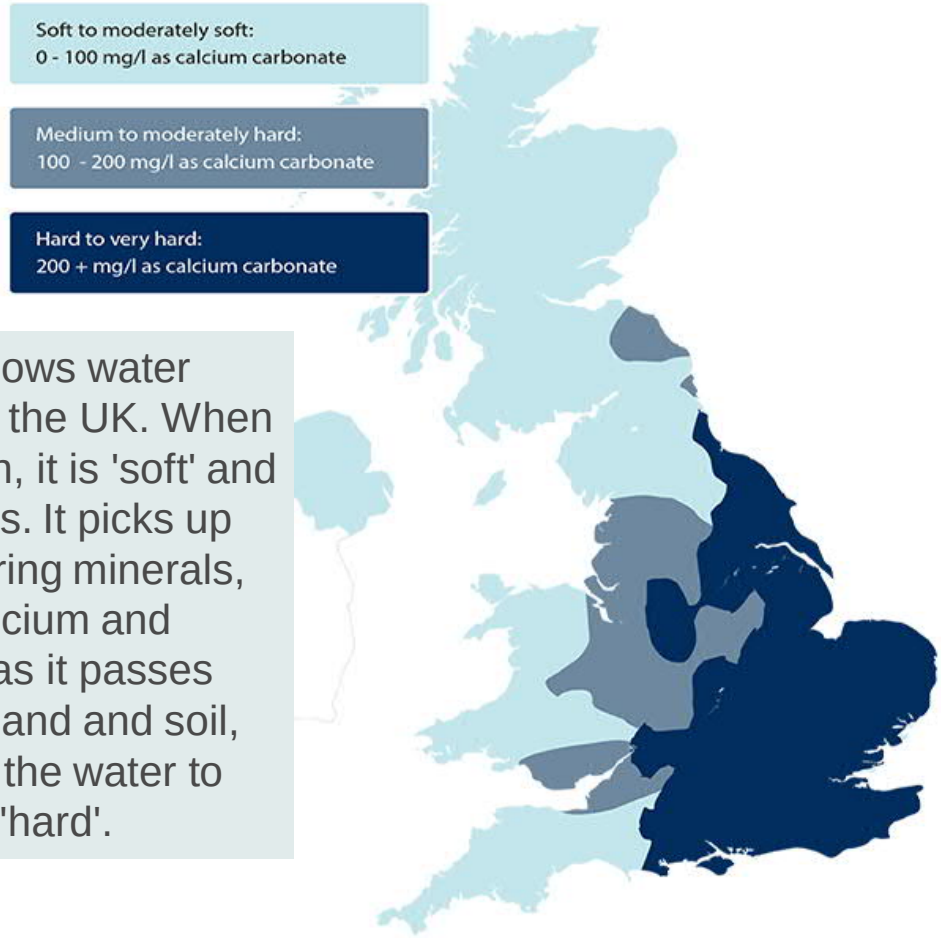
Consumer Council for Water

- Represent customers on matters relating to water.
- Investigate complaints and provide advice to ensure water services remain fair for customers

Office of Water Services (Ofwat)

- A regulator that makes sure water companies do their job properly, including fair pricing for customers and ensuring there is always a reliable water supply

CURRENT WATER SUPPLY



This map shows water hardness across the UK. When water falls as rain, it is 'soft' and free of minerals. It picks up naturally occurring minerals, such as calcium and magnesium, as it passes through rock, sand and soil, which causes the water to become 'hard'.

Hard water at home
Hard water leaves more limescale in your kettle and on your taps, and makes less bubbles from soap. It can be annoying, but doesn't do you any harm.

YOUR WATER SUPPLY

The amount of water taken each day to produce your water

Water companies take millions of litres a day but must be careful to balance society's needs while ensuring there is enough for the environment.

15,315
Million litres each day

Equivalent to

179 million
average sized baths

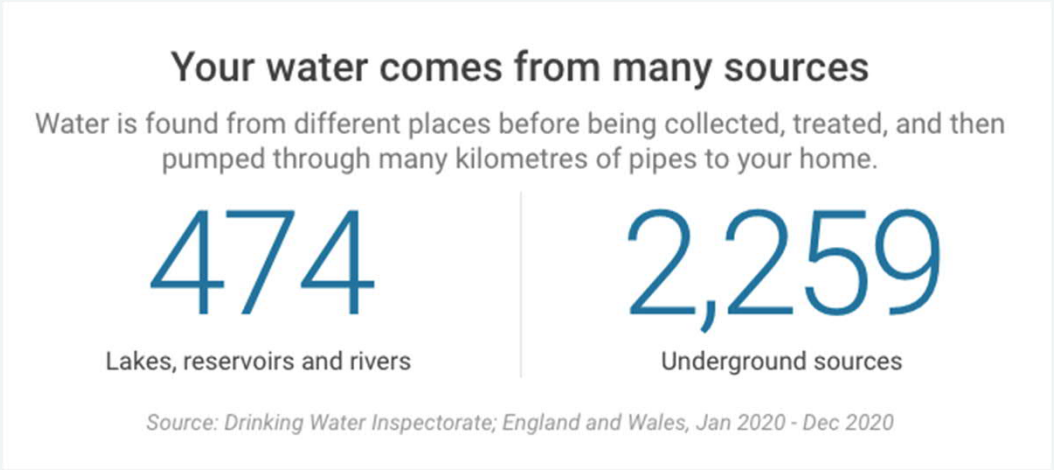
Source: Environment Agency and Natural Resources Wales; England and Wales, Jan 2015 - Dec 2015

It is not only water companies that take water from the environment

- 15,315 million litres for water companies to produce drinking water
- 429 million litres for agriculture
- 5,067 million litres for industrial processes
- 30,083 million litres for other uses including production of electricity

Source: Environment Agency and Natural Resources Wales; England and Wales, Jan 2015 - Dec 2015

WATER SUPPLY AND SERVICE



- Collecting and storing water is the first stage of delivering water to customers.
- Water is obtained from **lakes, reservoirs, rivers or underground sources**. Although there are more underground sources, most of the water that companies collect comes from lakes, reservoirs and rivers.
- This untreated water is then **pumped to water treatment plants**. In some cases, the untreated water is stored in reservoirs – this helps with the treatment process as large particles sink to the bottom.
- The amount of water that companies can take out of rivers or underground sources is controlled by the Environment Agency and Natural Resources Wales.

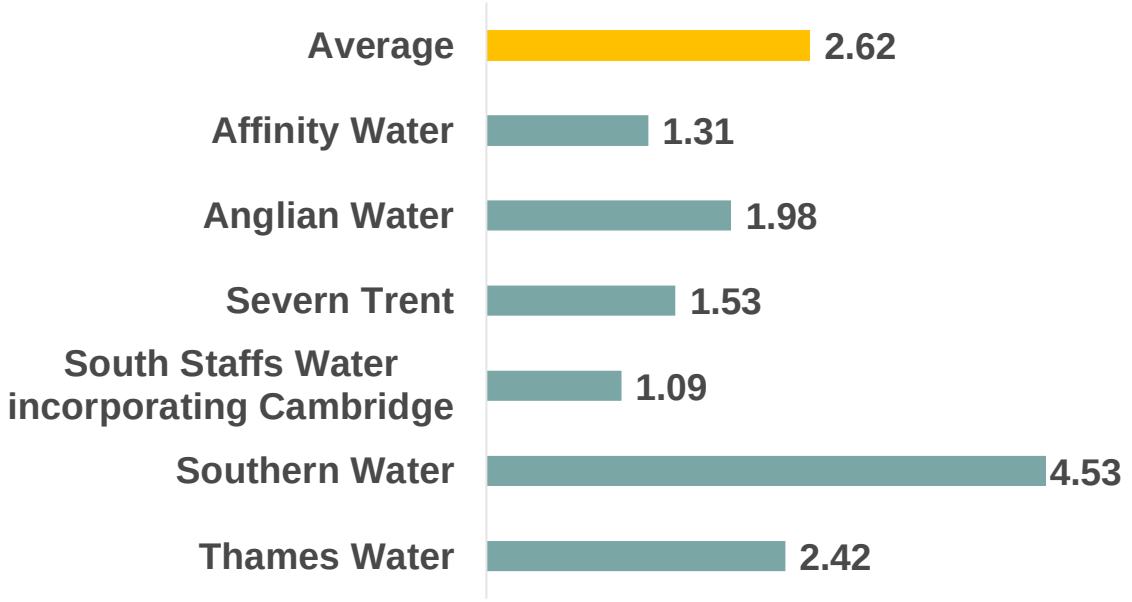
WATER SUPPLY AND SERVICE

There are **strict standards for the quality of your drinking water** – set to protect public health and ensure water quality is acceptable to customers. On average, **over 99.95% of all tests pass the standards**, and small variations are due to local factors which can affect individual samples of drinking water. The plumbing in your own home can also influence water quality if not fitted or maintained properly.

The chart on the right uses the Compliance Risk Index score to indicate water companies' performance in this area – the lower the score, the better.

Water quality across water companies

Overall 2020 performance against water quality tests (known as Compliance Risk Index (CRI)
Source: Drinking Water Inspectorate



WATER SUPPLY AND SERVICE

*The CCW stands for The Consumer Council for Water

WATER SUPPLY AND SERVICE

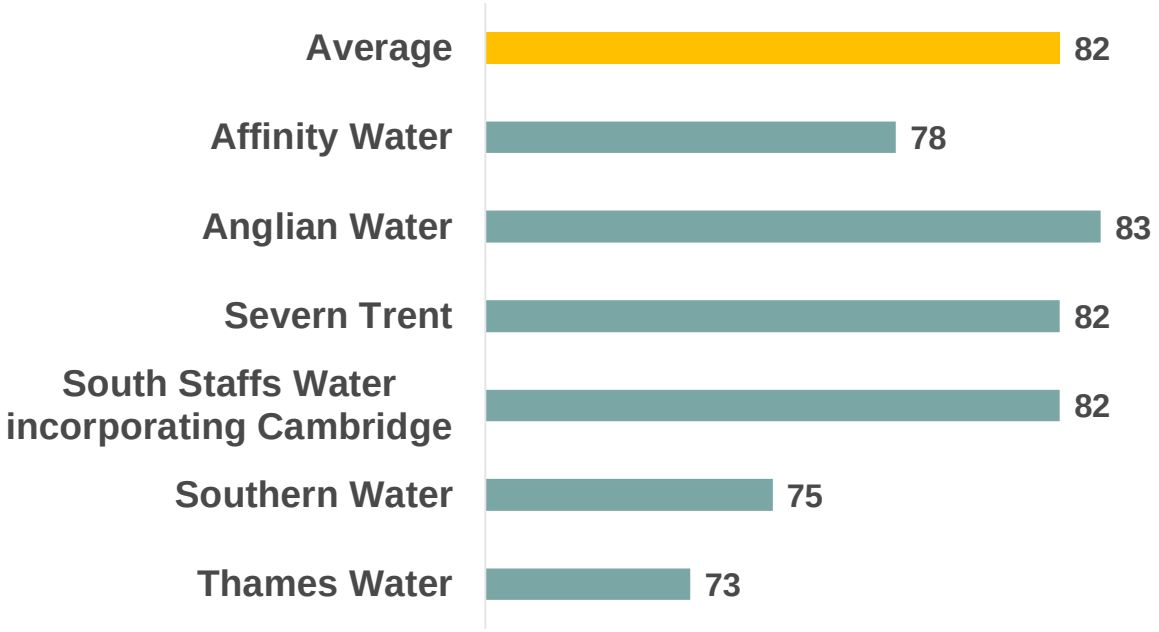
Ofwat (the industry regulator) measures the quality of service that companies provide to customers on a routine basis. The measure used is called the Customer Measure of Experience (C—Mex) and is scored out of 100. **The higher the score the better**.

This is measured through surveys with customers who have recently contacted their company and random members of the public. Customers are asked how satisfied they are with the service provided and how likely they would be to recommend the water company to family or friends.

Source: Water UK; England and Wales, Apr 2020 - Mar 2021

C-MeX score (out of 100)

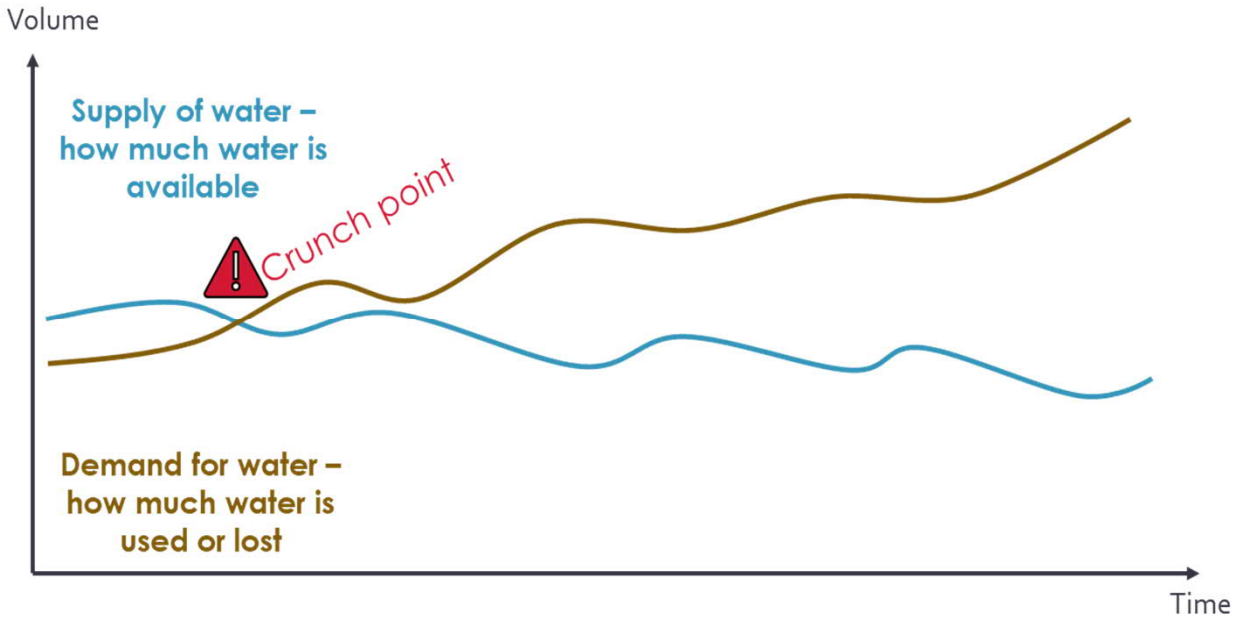
Company scores out of 100 for the latest year
Source: Water UK



WATER SOURCE PRESSURES

In order to ensure everyone receives water, water companies need to balance the **supply** (i.e., water available) with the **demand** for this water.

If the level of demand exceeds the amount of water for supply, we would end up at a crunch point, where there is not enough water.



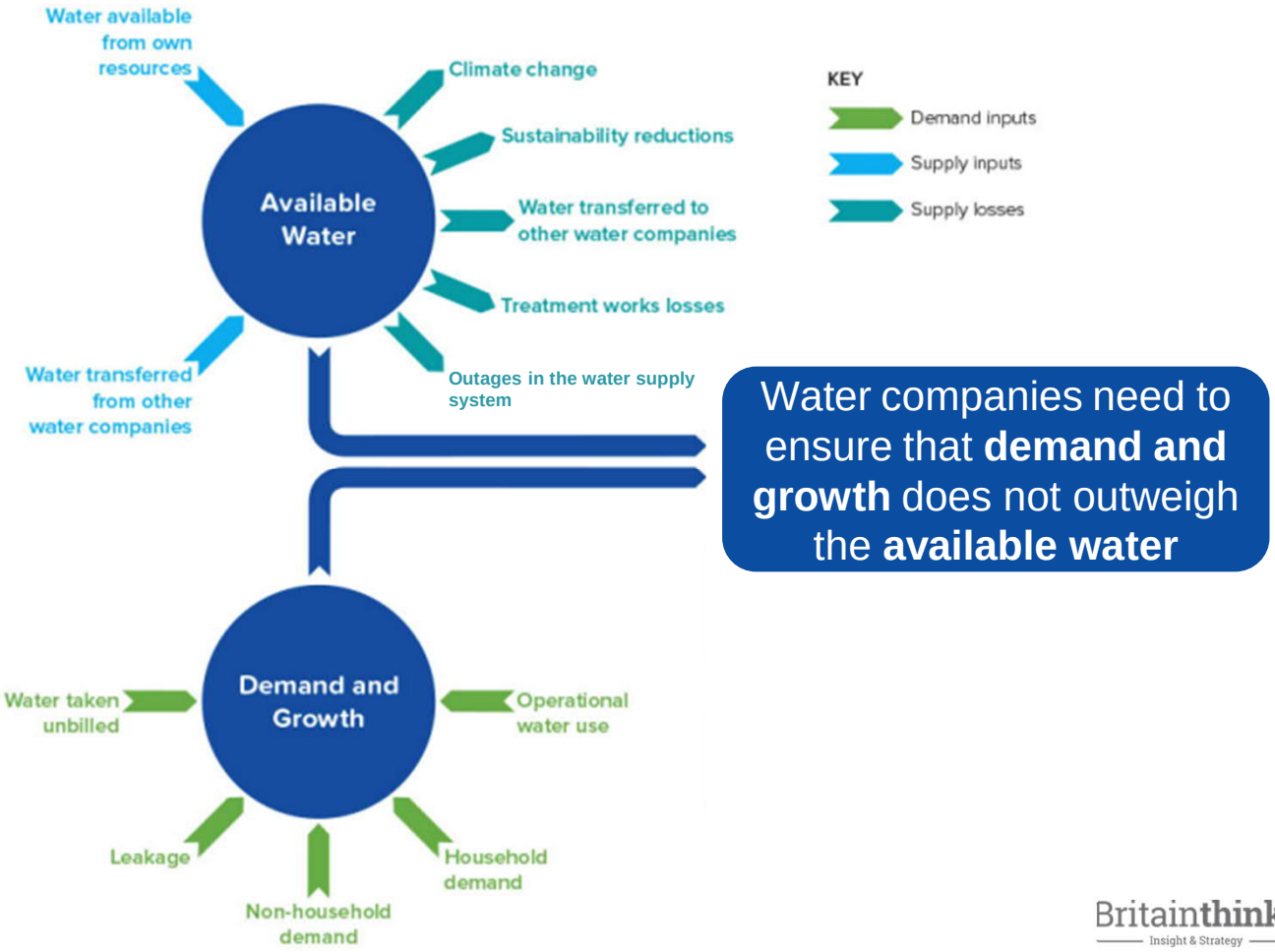
WATER SOURCE PRESSURES

These images show some of the things that influence how much water is available, and how large the demand for water is.

Water companies need to plan ahead to ensure that the demand for water does not exceed the supply.

They can do this by increasing supply and by reducing demand, and plan ahead many years to manage this.

When water companies need to invest, for example in a new supply, this cost is passed on to you via your water bill.



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WATER SOURCE PRESSURES

There are **3 key factors** that mean there will be **more pressure on water resources in the future**:

CLIMATE CHANGE

Changing climates could impact existing water sources both in normal years and when we experience a drought, which will change the amount of water that is available, mainly due to lower levels of rainfall. This is the main factor that could impact future water resources.

POPULATION GROWTH

More people in a region means an increase in the demand for water - more water must be supplied to more houses, as well as businesses serving the region.

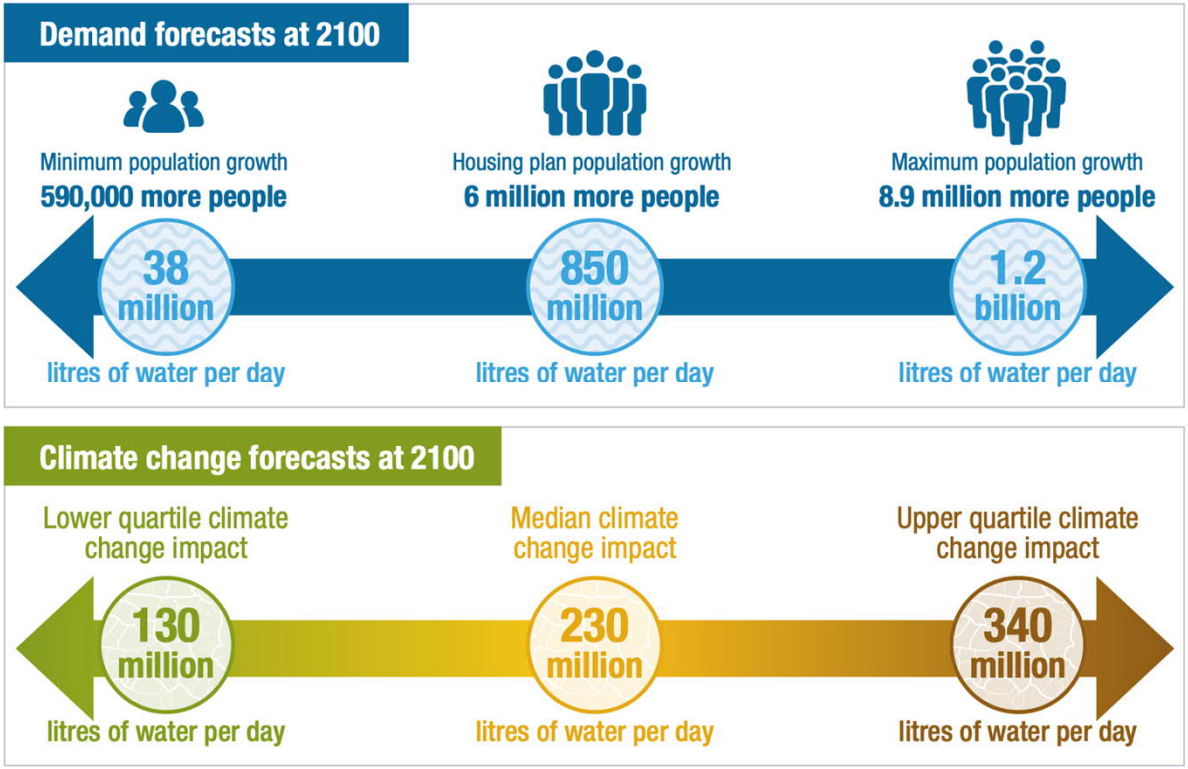
ENVIRONMENTAL PROTECTION

The environment must be protected, as if too much water is taken from the environment, less is available for wildlife habitats in lakes and rivers, which could cause irreversible harm to biodiversity.

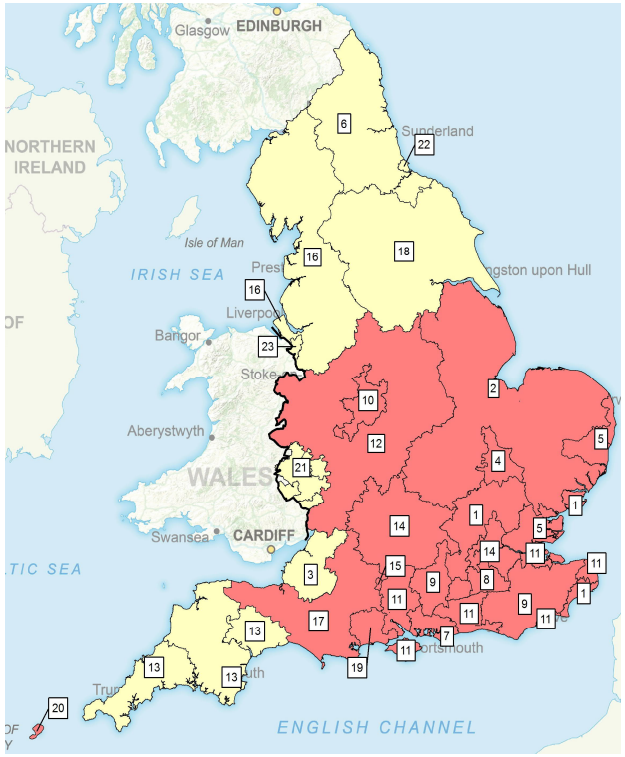
WATER SOURCE PRESSURES

While water companies do what they can to reduce demand and encourage customers to reduce their own use, the increase in pressures mean that **new water supplies (i.e., making more water available) will be needed** to ensure there is a reliable water source for everyone in the future.

The chart on the right shows just how much **additional water per day** could be needed by 2100 in the **South East** alone from population growth and climate change alone depending on a range of different predictions and potential scenarios.



WATER SOURCE PRESSURES



= seriously water stressed areas

= not seriously water stressed areas

Source: The Environment Agency, 2021

Most areas in England are defined as seriously water stressed. This means the current household demand for water is close to the rainfall available to meet that demand, either now or in the future.

This means water companies need to look for new ways of supplying customers with water. The diagram on the right shows the process by which water companies have new water supply options approved by Defra and regulators.

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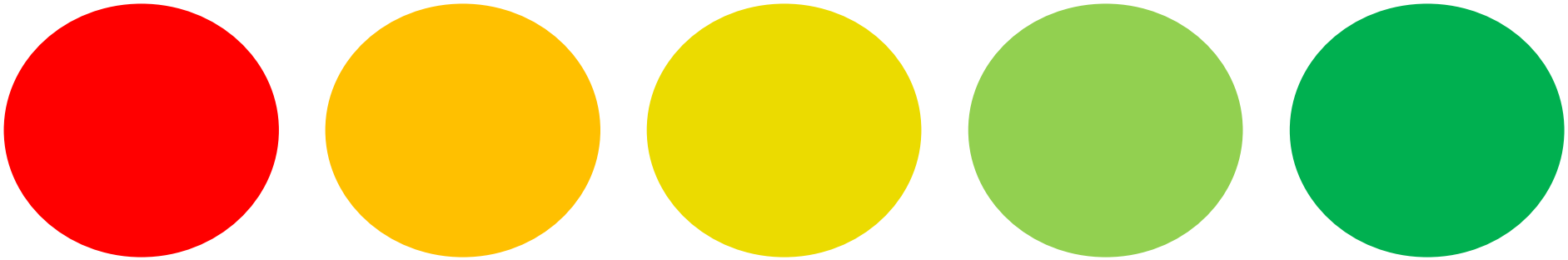
ASSESSING WATER SOURCES

Amount of water	Amount of additional water that the option can provide
Lead time	How long it will take before the water becomes available to supply customers
Cost	Cost per unit (litre) of water provided
Reliability under severe drought	Will the option still provide water during a severe drought
Resilience to other hazards	How vulnerable is the option to other hazards such as flooding or power outages
Energy use/Carbon	Energy used and carbon emitted during operation (carbon emissions cause climate change, so less carbon emissions is better)
Treatment required	Amount of water treatment required to meet water quality standards (more treatment can be more expensive and use more energy)
Positive environmental impact	E.g., protecting habitats of plants and animals
Negative environmental impact	E.g., damages habitats of plants and animals, produces waste and other pollutants

ASSESSING WATER SOURCES

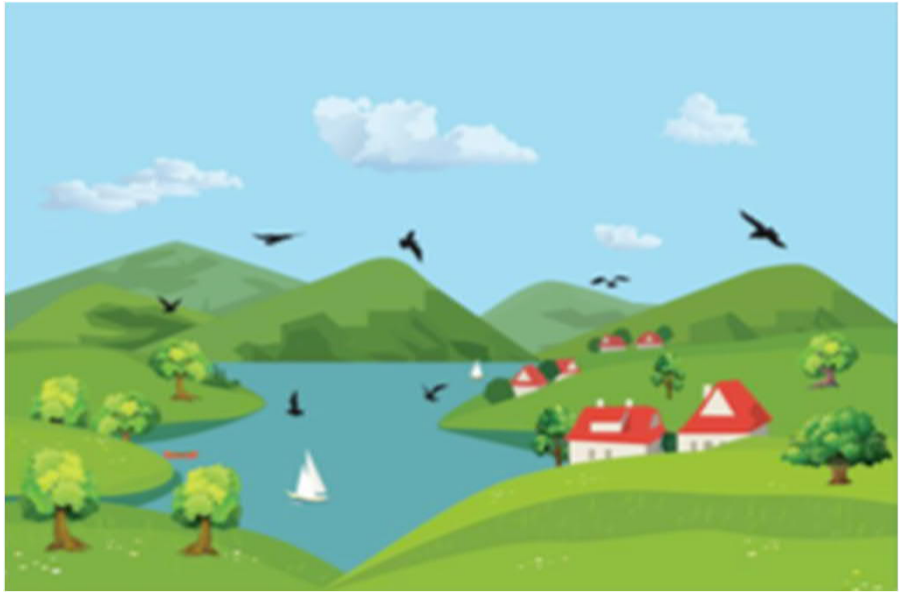


Very poor

Average

Very good

RESERVOIR TO STORE WATER



What is it?

New Reservoirs can be built to store water when it is available. Water can be taken from rivers during the winter, when there is plenty of water, and stored so it can be used during drier periods

Is it already used?

Reservoirs are already a widely used resource across the UK

CASE STUDY: Proposed Fens Reservoir (between Peterborough and Kings Lynn)

- Would be able to provide 99 million litres of water a day to Anglian, Cambridge and Affinity Water customers
- Would cost roughly £107mn to construct, plus costs for new pipelines
- Would be able to start supplying homes by the mid-late 2030s

RESERVOIR TO STORE WATER

Amount of water	Lead time in years	Cost	Reliability under drought	Resilience to other hazards	Energy use/Carbon	Positive environment impacts	Negative environment impact
HIGH	12						

- ✓ Reliable – provides large volumes of additional water when it's needed e.g., in summer
- ✓ Will deliver the amount of water is planned in most conditions
- ✓ Once built, they can be used for recreation e.g., fishing and sailing
- ✓ Creates new habitats to support a range of wildlife
- ✓ Low cost to operate
- ✓ Could be used to help alleviate flooding

- X High cost option to build
- X Takes a long time to plan, get permission for, and build
- X May not be suitable for all location due to local geology (i.e., rock and ground material)
- X During construction there is lots of disruption on communities
- X Disrupts landscape and the natural environment, including loss of habitats for plants and wildlife that could reduce biodiversity
- X Is less flexible to future changes, including weather patterns

DESALINATION

What is it?

Taking sea water and treating it, including removing the salt, so it can be used for water supply.

Is it already used?

Limited use in UK but more common worldwide.

CASE STUDY: Beckton desalination plant (Thames)

- Cost £250mn, and can produce 100 million litres of water per day, supplying 400,000 homes in North London
- Uses approximately 5 times more energy than normal water treatment
- Only operates during periods of drought, periods of low rainfall or to maintain supplies in case of an incident

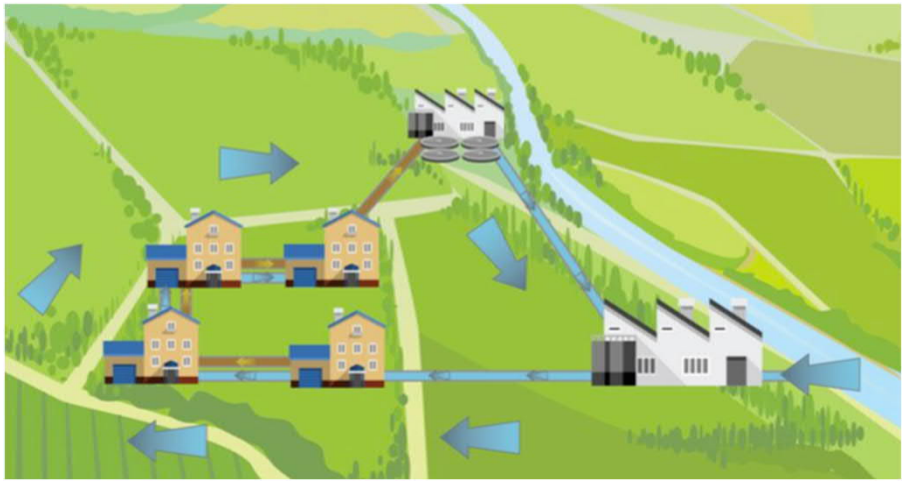
DESALINATION

Amount of water	Lead time in years	Cost	Reliability under drought	Resilience to other hazards	Energy use/Carbon	Positive environment impacts	Negative environment impact
HIGH	4-6						

- ✓ Reliable source of large volumes of additional water
- ✓ Water is always available, even in times of drought
- ✓ The treatment works can be built in a way that makes them more flexible to future changes (e.g., in demand)
- ✓ Possibility to use green energy sources in the future

- X High cost option to operate
- X Restricted to areas where there is a coastline or estuary
- X Currently, it requires a lot of energy and has a high carbon footprint
- X Disrupts marine and coastal wildlife and habitats
- X Process to purify water produces salt as a waste product, which needs to be safely disposed of
- X Difficult to operate if only used intermittently

RECYCLED WATER



What is it?

This involves taking treated wastewater and recycling it through a water treatment works for re-treatment to a very high standard so that it can be used for water supply. All public drinking water has to pass high legal and quality safety standards.

Is it already used?

Already happens as part of the existing water supply system

CASE STUDY: Proposed plant at Minworth (near Birmingham)

- Would be able to supply up to 215 million litres of water per day
- Would be a robust, reliable and resilient source of raw water
- Cost is expected to be between £0.9m and £3.6m depending on the exact specification

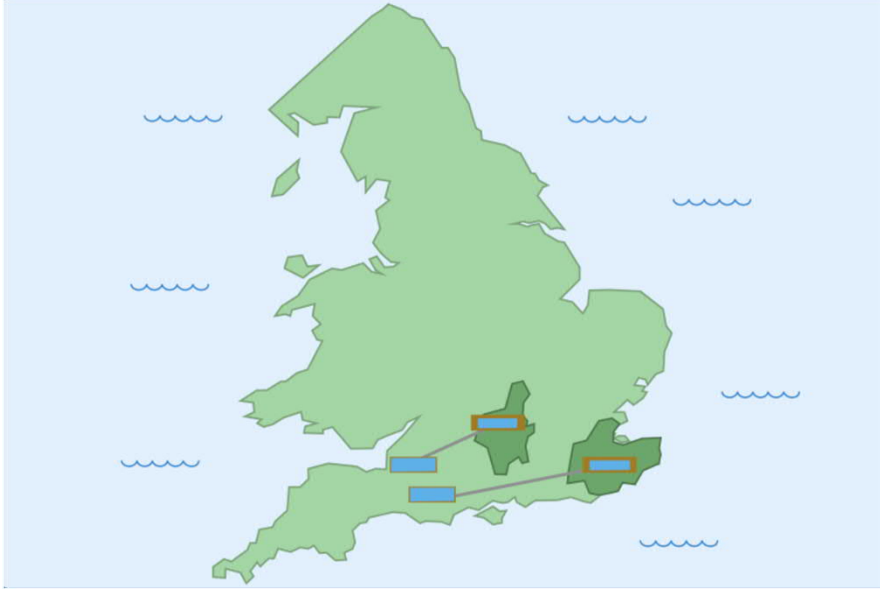
RECYCLED WATER

Amount of water	Lead time in years	Cost	Reliability under drought	Resilience to other hazards	Energy use/Carbon	Positive environment impacts	Negative environment impact
HIGH	4-6						

- ✓ Reliable source of large volumes of additional water
- ✓ Allows for the reuse of a resource that would otherwise be lost
- ✓ The treatment works can be built in a way that makes them more flexible to future changes (e.g., in infrastructure)

- X High cost option to operate
- X Requires advanced treatment which uses lots of chemicals and energy
- X Chemicals used in the process could impact local plant and wildlife
- X Not as flexible to future changes e.g., if demand alters or there are changes to the wastewater
- X Dependent upon a suitable location being found

WATER TRANSFER



What is it?

Water may be transferred within a water company, between companies or between regions. Water may be transferred via dedicated pipelines, or using rivers or canals (with some connecting pipelines).

Is it already used?

This system is already used in many countries, including part of the UK

CASE STUDY: Grand Union Canal (near Birmingham)

- Would cost between £250-560mn to construct depending on the extent of transfers, and would be able to supply between 50-100 million litres of water per day
- Would utilise existing canal infrastructure and be in use by 2035
- Water would be transferred from an area that is less water stressed to an area that is more water stressed

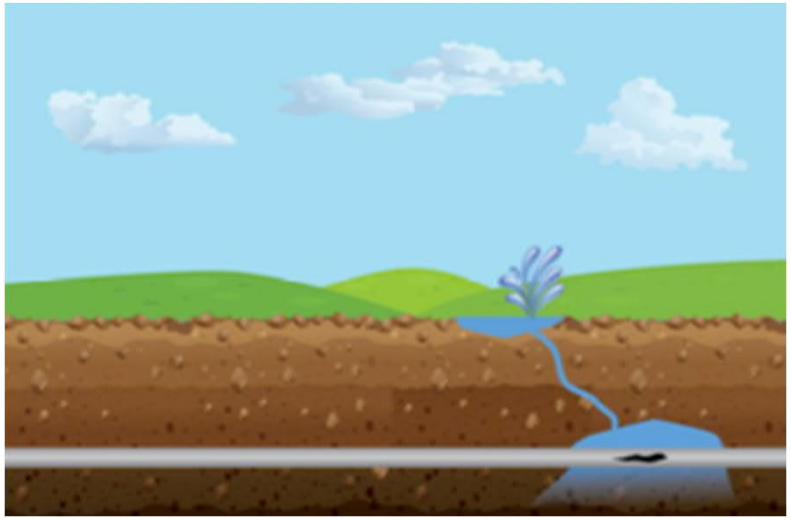
WATER TRANSFER

Amount of water	Lead time in years	Cost	Reliability under drought	Resilience to other hazards	Energy use/Carbon	Positive environment impacts	Negative environment impacts
HIGH	3-12						

- ✓ Can provide large volumes of additional water to supplement local resources
- ✓ Creates more connections in the water supply system
- ✓ Using the river or canal system may give opportunities for environmental improvement due to better water flows

- X Can be a high cost option- water is heavy, so may need lots of energy to move it
- X Taste, smell and hardness of water may change if water is transferred from a different area with a different water source
- X The volume of water that can be supplied is limited by the capacity of the river/canal and whether neighbouring water companies have enough themselves (e.g., during a drought)
- X Water may be contaminated during the transfer.
- X There may be impacts on the water environment e.g., if non-native species were transferred between rivers to an area where they are invasive

WATER EFFICIENCY | Leakage and Metering



What is it?

Water companies work to ensure the water available is used as efficiently as possible. This is done through repairing leaks and bursts, making sure treatment plants are efficient, and installing meters to help customers identify leaks and manage how much water they use.

Is it already used?

Yes – by UK water companies

CASE STUDY: South Staffs Water | Satellite leak detection

- On average, 117 litres of water per household in the UK is lost through leaks everyday
- South Staffs use satellite technology to detect leaks by looking for signs liked discoloured tarmac or soil
- This has helped identify leaks, resulting in a saving of over 2 million litres of water per day

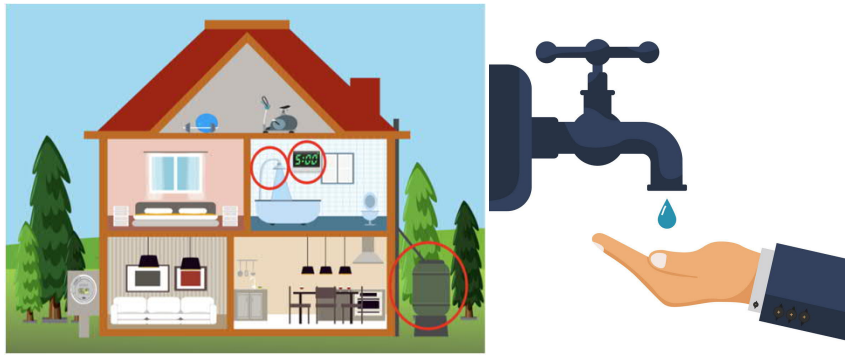
WATER EFFICIENCY | Leakage and Metering

Amount of water	Lead time in years	Cost	Reliability under drought	Resilience to other hazards	Energy use/Carbon	Positive environment impacts	Other negative environment impact
MEDIUM	1-5						

- ✓ Reduces need to take more water from rivers and underground
- ✓ Keeps more water in the 'supply system'
- ✓ Easy to install meters and are low cost
- ✓ Households use 10% less water on average in the years after a meter is fitted, though this reduces to 5% less water after 5 years after the meter is fitted

- X Many leaks are deep in the ground and are expensive to find or fix, causing disruption and congestion from road works
- X Hidden leaks are expensive and hard to find
- X Up to a quarter of leaks can be on customer properties, which are the responsibility of customers
- X The amount of water saved would only provide part of future water needs
- X Installing meters does not guarantee water saving

WATER EFFICIENCY | Education



What is it?

Water companies provide customers with advice and education on how to use less water, and encourage the use of water saving devices such as water butts (for watering the garden), shower timers and water efficient shower heads to reduce demand. This requires customers to change their own water usage and habits.

Is it already used?

Yes – by UK water companies

CASE STUDY: Save Water Save Money

- Water companies across the UK promote this service to customers to help them save water
- It sells various tools to save water, such as water butts to collect rainwater for the garden, or a hippo bag to reduce the water used each time your toilet flushes, as well as tips on identifying leaks on your property

WATER EFFICIENCY | Education

Amount of water	Lead time in years	Cost	Reliability under drought	Resilience to other hazards	Energy use/Carbon	Positive environment impacts	Negative environment impact
LOW	1-3						

- ✓ Water saving devices are easy to install & there is minimal disruption for customers
- ✓ Low cost
- ✓ Can reduce bills for people on meters
- ✓ Reduces the need to increase the supply of water, so avoids negative environmental impacts

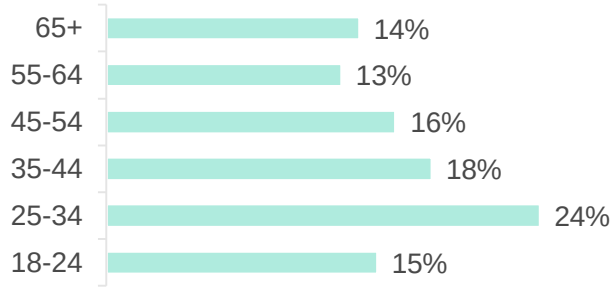
- X Unreliable, as customers will not necessarily change their behaviours to use less water/ not reduce their use enough to ensure the supply is reliable in the long term
- X Needs lots of customers to change their behaviours and have the devices fitted

2 Quantitative research

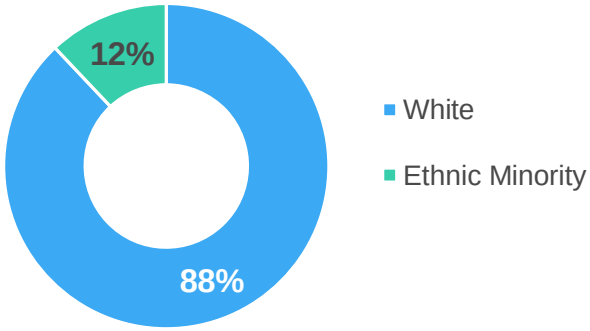
Sample breakdown

Sample: Demographics

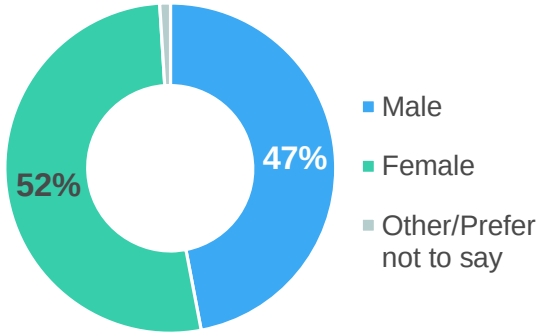
Age



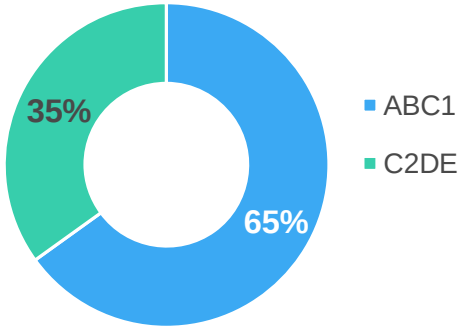
Ethnicity



Gender



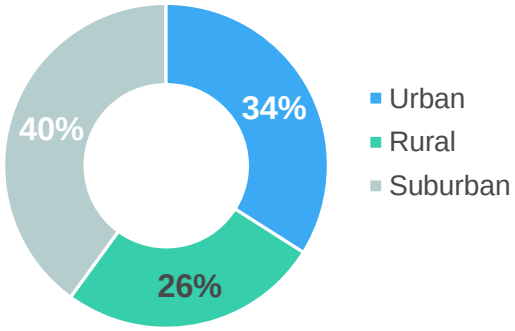
SEG



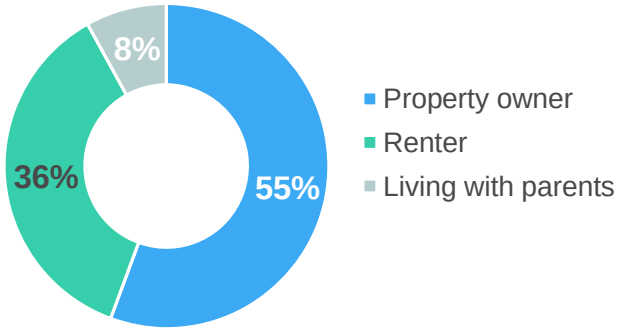
D1. How old are you? Base: All HH respondents (n=1762). D2. In which of the following ways do you identify? Base: All respondents (n=1762). D5. Which of the following best describes the profession of the chief income earner in your household? Base: All HH respondents (n=1762) D7. Which of the following best describes your living situation? Base: All HH respondents (n=1762). D8. How would you describe your ethnic origin? Base: All HH respondents (n=1762). HH data weighted to natrep standard based on Age/Gender/SEG.

Sample: Household types

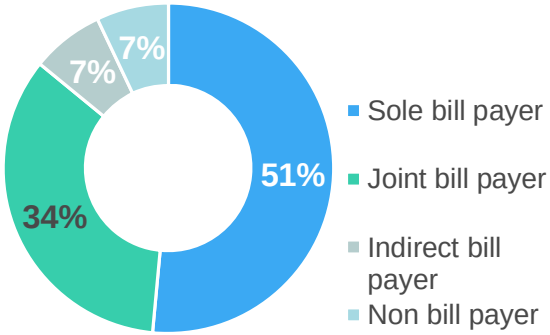
Type of area



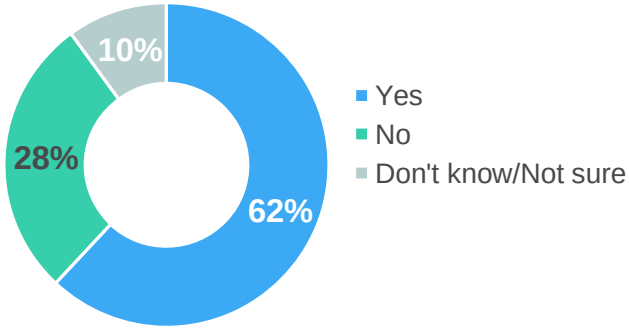
Living situation



Water bill payers



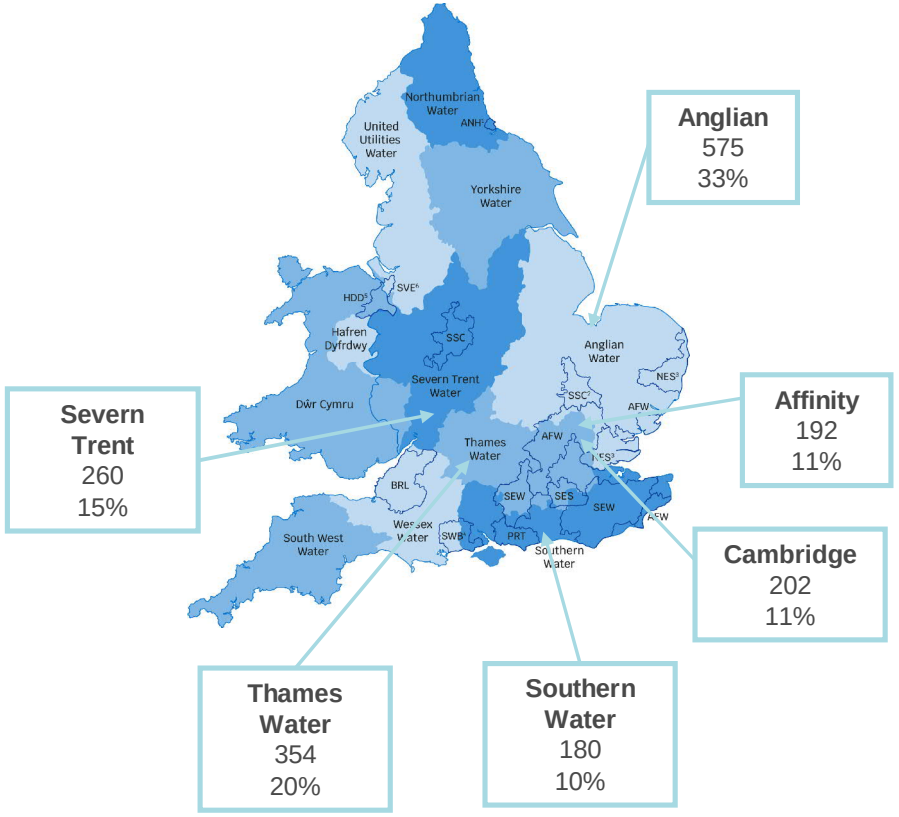
Water meter



D6. How would you describe the area you live in? Base: All HH respondents (n=1762). D9. When it comes to paying each of these types of bills for your home, which of the following best describes you? Base: All HH respondents (n=1762). D10. Do you have a water meter? Base: All HH respondents (n=1762). Household data weighted to natrep standard based on Age/Gender/SEG.

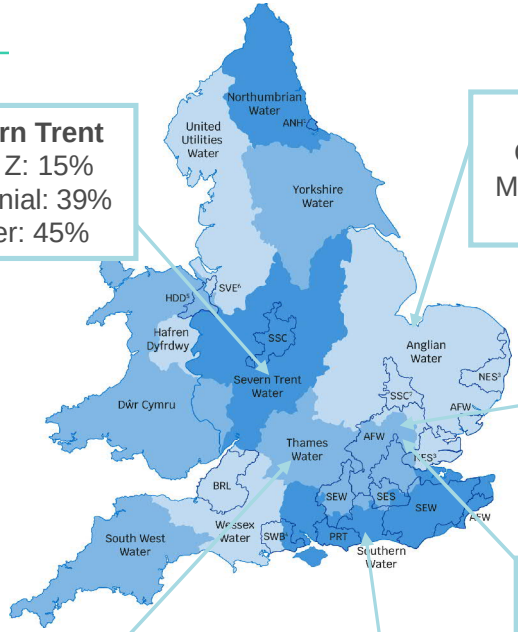
Sample: Household Customers by water company

Household Customers by water company	Number of participants	Proportion of total sample
Anglian	575	33%
Affinity	192	11%
Cambridge	202	11%
Southern Water	180	10%
Thames Water	354	20%
Severn Trent	260	15%



Hidden routing from D4. What is your postcode/area code? Base: All HH respondents (n=1762)

Sample: Age & Gender by water company (HH)



Severn Trent
Gen Z: 15%
Millennial: 39%
Other: 45%

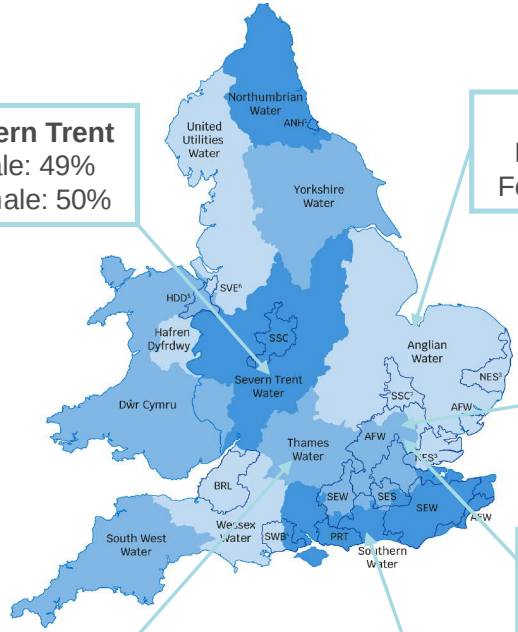
Anglian
Gen Z: 16%
Millennial: 41%
Other: 43%

Affinity
Gen Z: 19%
Millennial: 30%
Other: 51%

Cambridge
Gen Z: 14%
Millennial: 67%
Other: 19%

Thames Water
Gen Z: 14%
Millennial: 37%
Other: 49%

Southern Water
Gen Z: 14%
Millennial: 38%
Other: 48%



Severn Trent
Male: 49%
Female: 50%

Anglian
Male: 43%
Female: 57%

Affinity
Male: 49%
Female: 50%

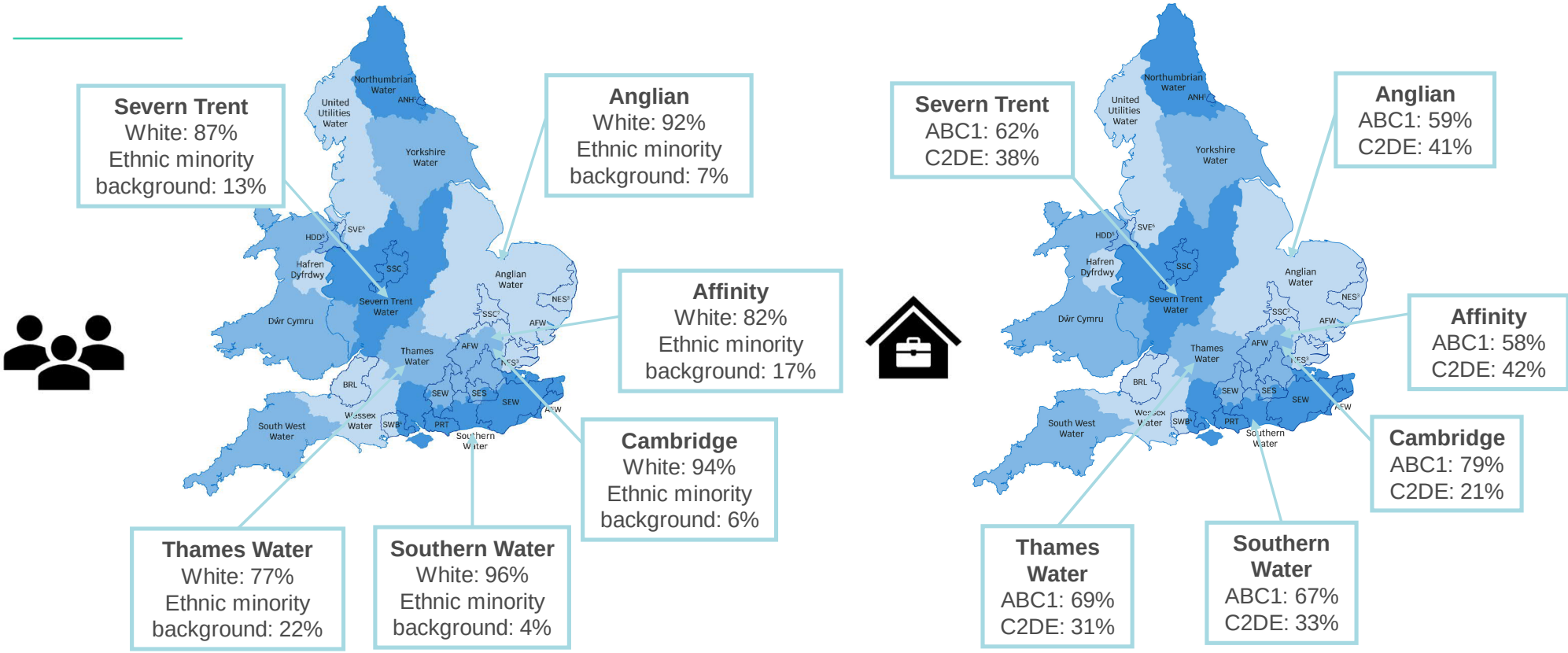
Cambridge
Male: 45%
Female: 54%

Thames Water
Male: 51%
Female: 49%

Southern Water
Male: 51%
Female: 49%

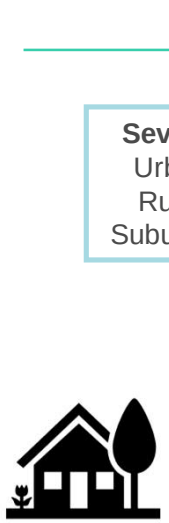
D1. How old are you? Base: All HH respondents (n=1762)
D2. In which of the following ways do you identify? Base: All HH respondents (n=1762)

Sample: Household Customers by Ethnicity & SEG (HH)



D5. Which of the following best describes the profession of the chief income earner in your household? Base: All HH respondents (n=1762).
D8. How would you describe your ethnic origin? Base: All HH respondents (n=1762).

Sample: Type of area & Living situation by water company (HH)



Severn Trent
Urban: 27%
Rural: 30%
Suburban: 43%

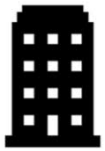
Anglian
Urban: 25%
Rural: 36%
Suburban: 39%

Affinity
Urban: 31%
Rural: 23%
Suburban: 46%

Cambridge
Urban: 51%
Rural: 22%
Suburban: 27%

Thames Water
Urban: 49%
Rural: 13%
Suburban: 38%

Southern Water
Urban: 30%
Rural: 22%
Suburban: 49%



Severn Trent
NET: Property owner: 56%
NET: Renter: 35%
NET: Living with parents: 8%

Anglian
NET: Property owner: 56%
NET: Renter: 35%
NET: Living with parents: 8%

Affinity
NET: Property owner: 47%
NET: Renter: 40%
NET: Living with parents: 11%

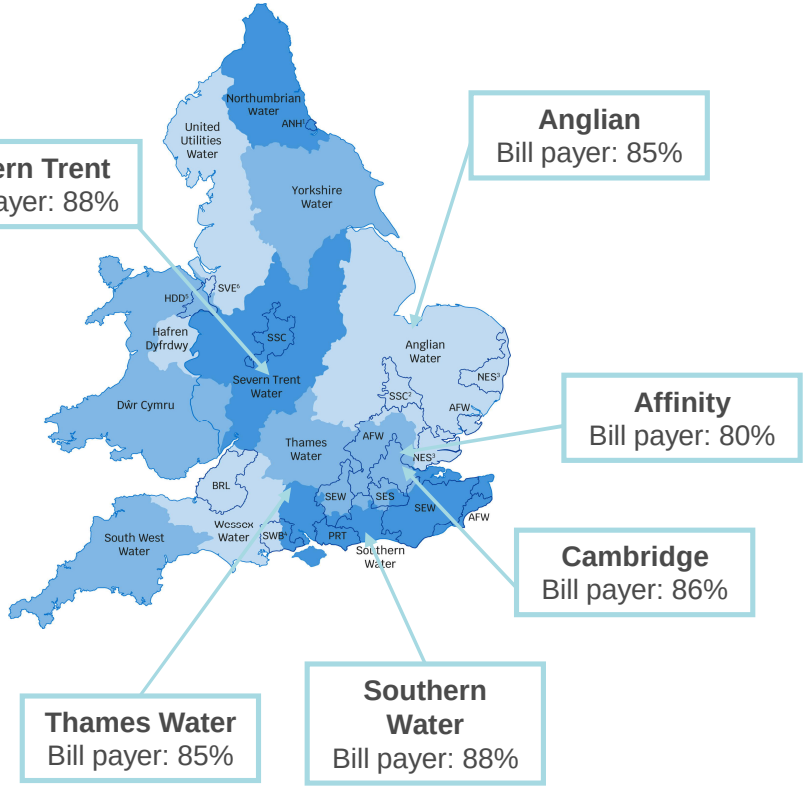
Cambridge
NET: Property owner: 64%
NET: Renter: 30%
NET: Living with parents: 5%

Thames Water
NET: Property owner: 51%
NET: Renter: 39%
NET: Living with parents: 9%

Southern Water
NET: Property owner: 54%
NET: Renter: 36%
NET: Living with parents: 7%

D6. How would you describe the area you live in? Base: All HH respondents (1762).
D7. Which of the following best describes your current living situation? Base: All HH respondents (n=1762)

Sample: Water bill payers & Water meter users by water company (HH)



Severn Trent
Bill payer: 88%

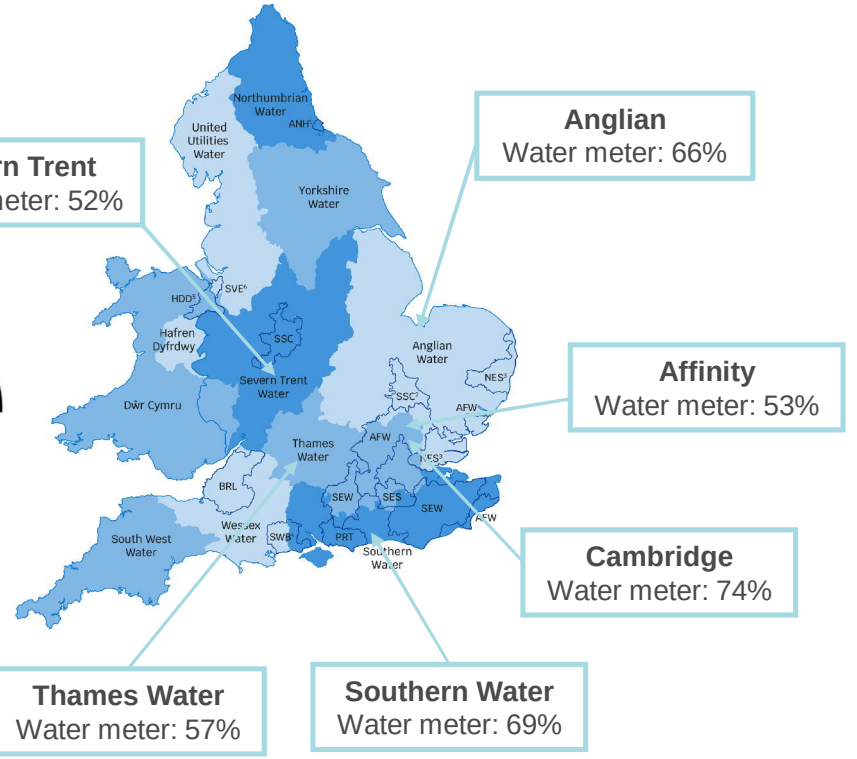
Anglian
Bill payer: 85%

Affinity
Bill payer: 80%

Cambridge
Bill payer: 86%

Thames Water
Bill payer: 85%

Southern Water
Bill payer: 88%



Severn Trent
Water meter: 52%

Anglian
Water meter: 66%

Affinity
Water meter: 53%

Cambridge
Water meter: 74%

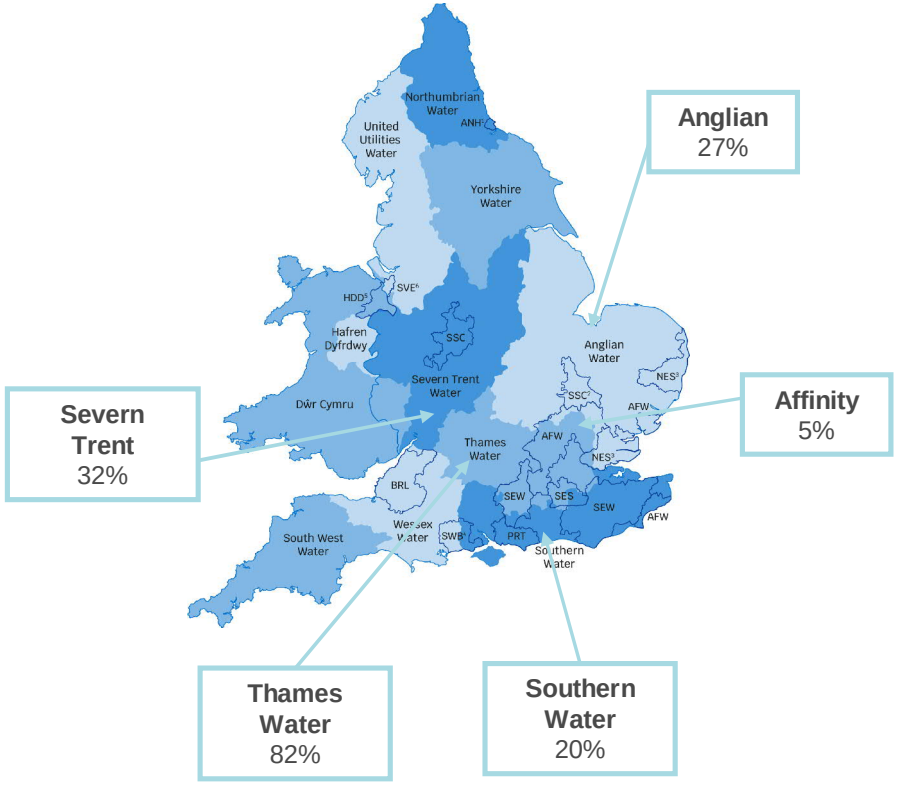
Thames Water
Water meter: 57%

Southern Water
Water meter: 69%

D9.1. When it comes to paying each of these types of bills for your home, which of the following best describes you? – Water. Base: All HH respondents (n=1762).
D10. Do you have a water meter? Base: All HH respondents (n=1762).

Sample: Non-household Customers by water company

Household Customers by water company	Number of participants	Proportion of total sample
Anglian	54	27%
Affinity	10	5%
Cambridge	-	-
Southern Water	20	10%
Thames Water	82	41%
Severn Trent	32	16%



Hidden routing from D4. What is your postcode/area code? Base: All NHH respondents (n=198)

Sample: Non-household customers

Number of workers in organisation	Number of participants	Proportion of sample
1 (0 employees)	6	3%
2-4	4	2%
5-9	20	10%
10-19	23	12%
20-49	25	13%
50-99	37	19%
100-249	35	18%
250+	48	24%

NHH3. Including yourself, how many people work for your organization? Base: All NHH respondents (n=198)

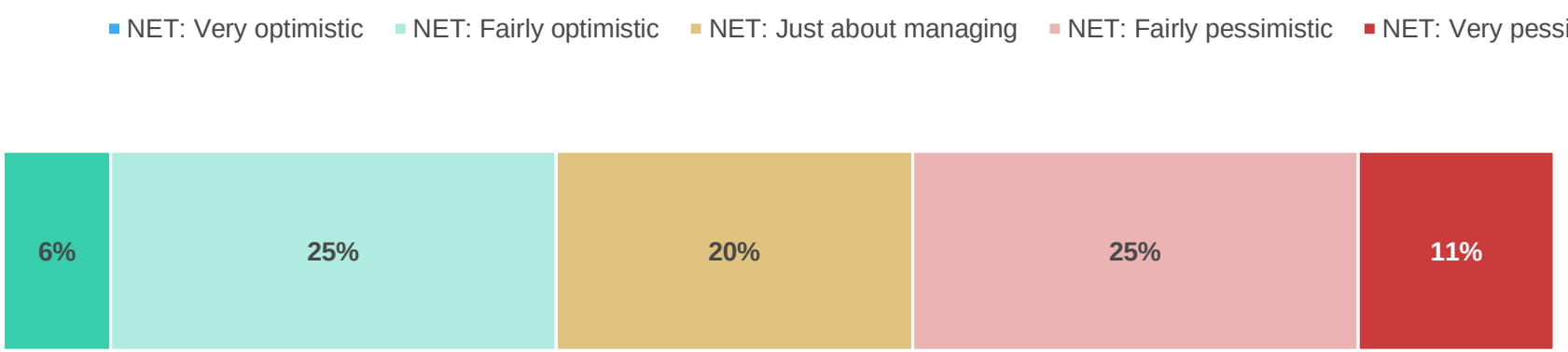
Sample: Non-household customers

Type of business	Number of participants	Proportion of sample
Agriculture, Forestry and Fishing	9	5%
Mining and quarrying	0	-
Manufacturing	20	10%
Electricity, Gas, Steam and air conditioning	6	3%
Water supply, sewerage, waste management and remediation activities	0	-
Construction	19	10%
Wholesale and retail trade; repair of motor vehicles and motorcycles	10	5%
Transport and storage	10	5%
Accommodation and food service activities	19	10%
Information and communication	11	6%
Financial and insurance activities	15	8%
Real estate activities	5	3%
Professional, scientific and technical activities	12	6%
Administrative and support service activities	8	4%
Public administration and defence; compulsory social security	2	1%
Education	13	7%
Human health and social work activities	13	7%
Arts, entertainment and recreation	11	6%
Other	15	8%

NHH4. What type of business do you work for? Base: All respondents (n=198).

Optimism or pessimism on cost of living – Household customers

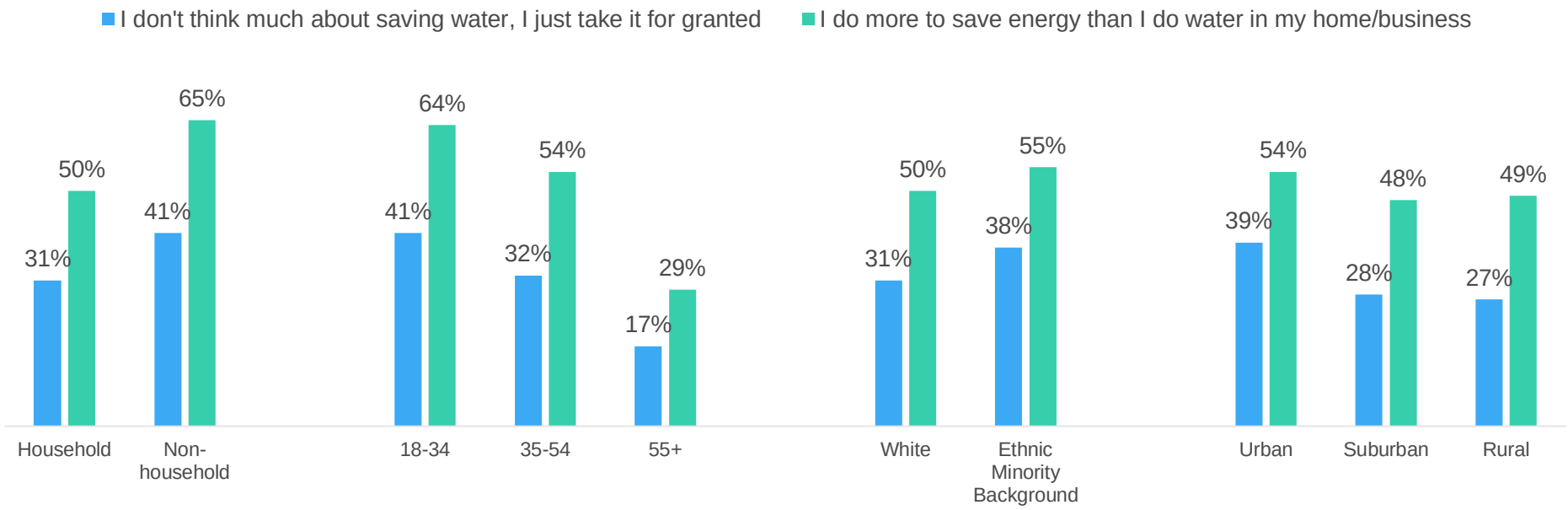
Thinking about your personal life, to what extent are you feeling optimistic or pessimistic about being able to afford luxuries/essentials in life?



B1. Thinking about your personal life, to what extent are you feeling optimistic or pessimistic about the following? Being able to afford the essentials in life/Being able to afford the luxuries in life.
Base: All respondents (n=1762).

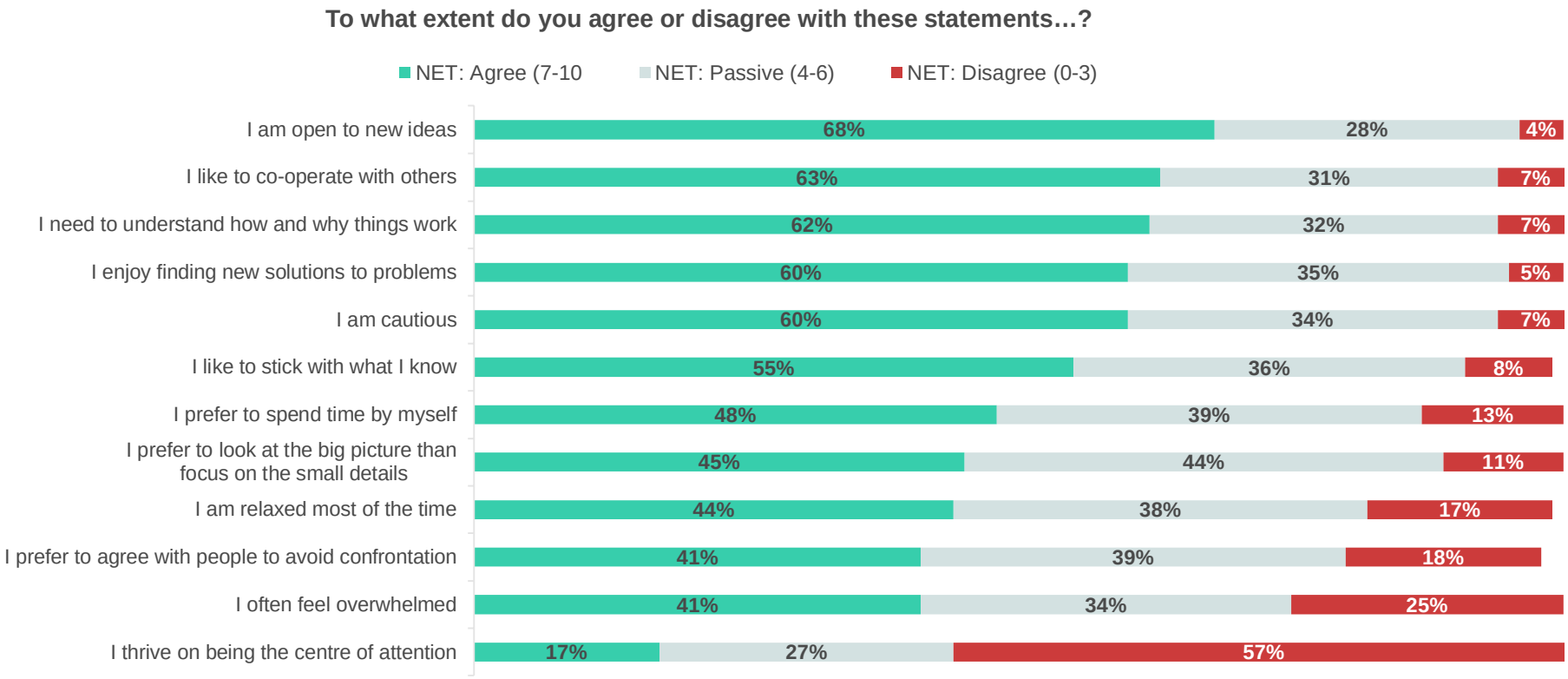
Younger respondents, those from urban areas and ethnic minority backgrounds report taking water for granted more

To what extent do you agree with the following statements?
% agree/strongly agree



B4. To what extent do you agree with these statements? 'I don't think much about saving water, I just take it for granted.' "I do more to save energy than I do water in my home/business"
Base: All respondents, HH (n=1762), NHH (n=198)

Behavioural – Household customers



B2. To what extent do you agree or disagree with the following statements about yourself on a scale from 0 to 10 where 0 is strongly disagree and 10 is strongly agree? Base = All respondents (n=1762).

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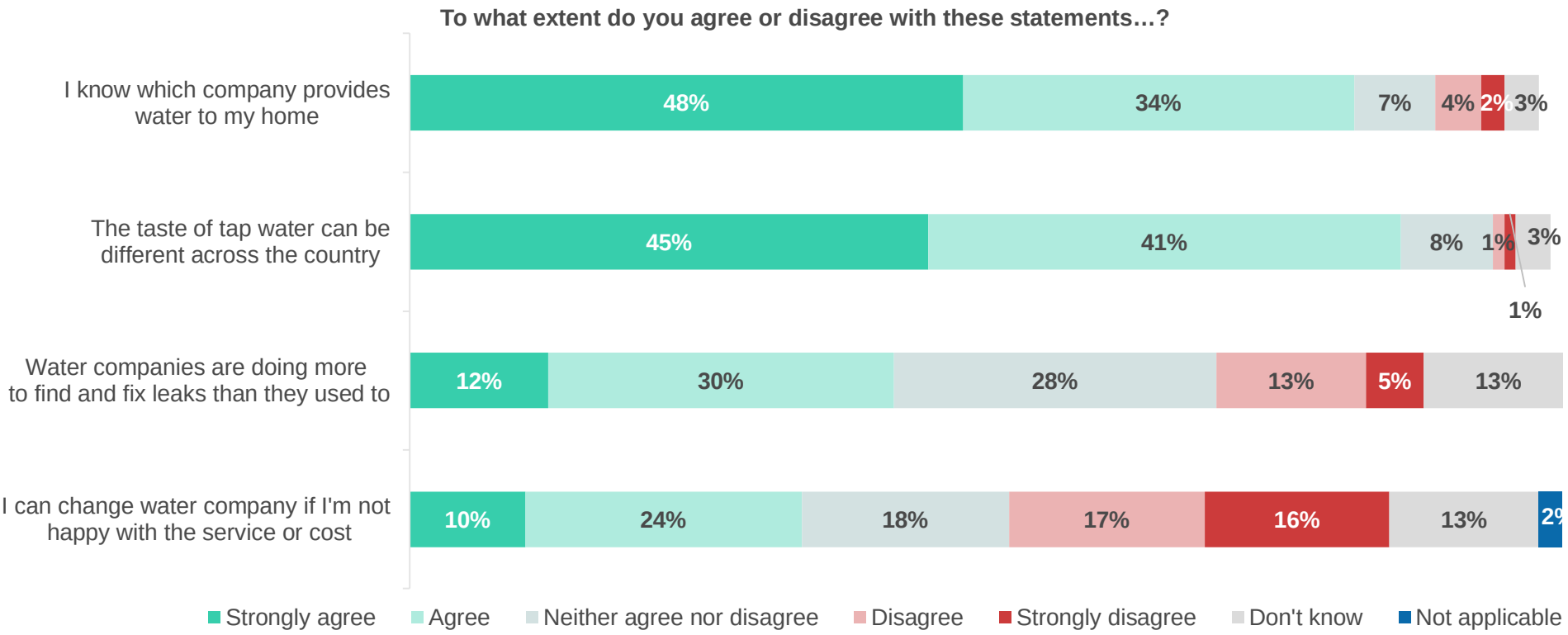
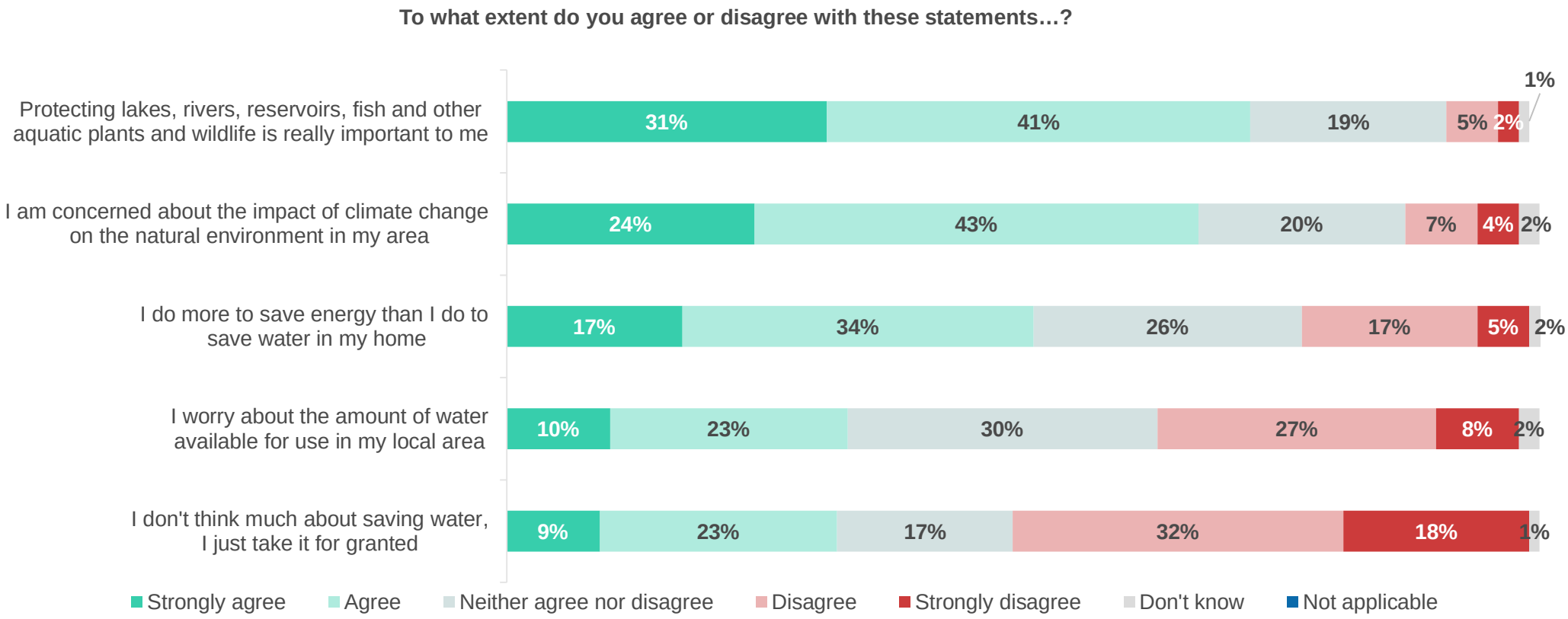
Water knowledge – Household customers



B4. To what extent do you agree with these statements? Base = All respondents (n=1762)

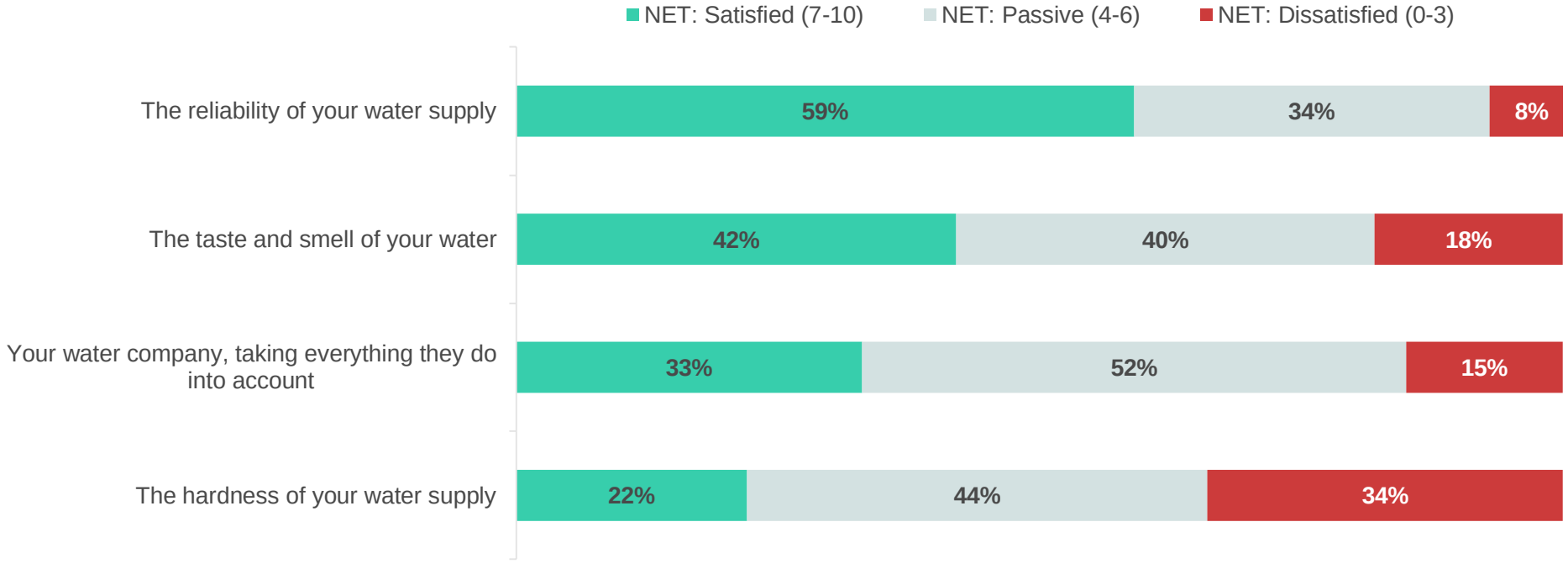
Water knowledge– Household customers



B4. To what extent do you agree with these statements? Base = All respondents (n=1762)

Water company satisfaction – Household customers

How satisfied or dissatisfied would you say you are with the following aspects of your water supply?

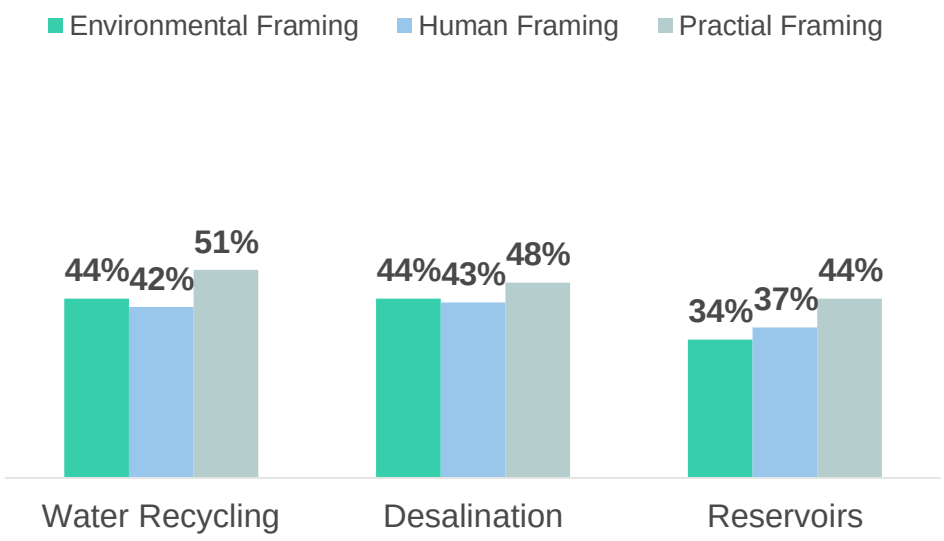


B6. How satisfied or dissatisfied would you say you are with the following aspects of your water supply? Base = All respondents (n=1762).

Levels of concern – 35-54

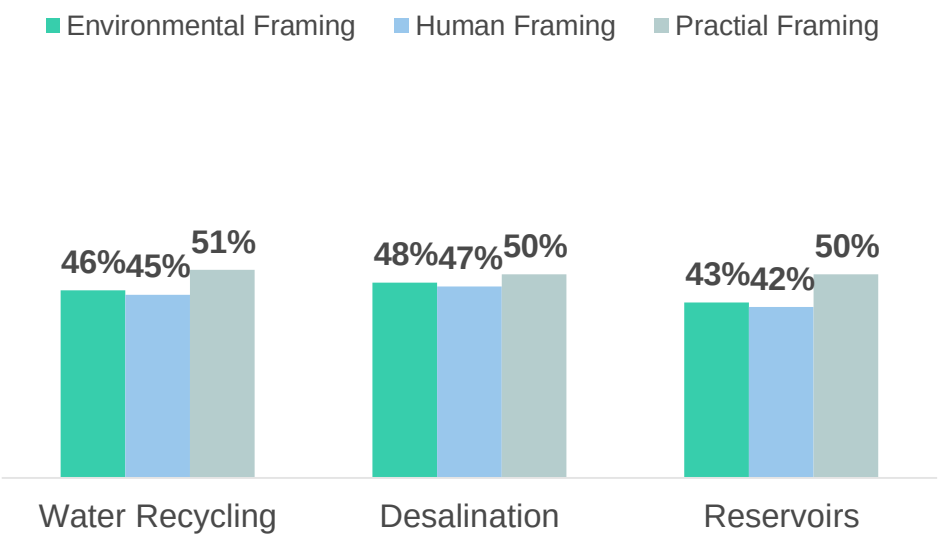
Rated level of concern about change after seeing each framing – Total

Showing % concerned (very + somewhat)



Rated level of concern about change after seeing each framing – 35-54

Showing % concerned (very + somewhat)

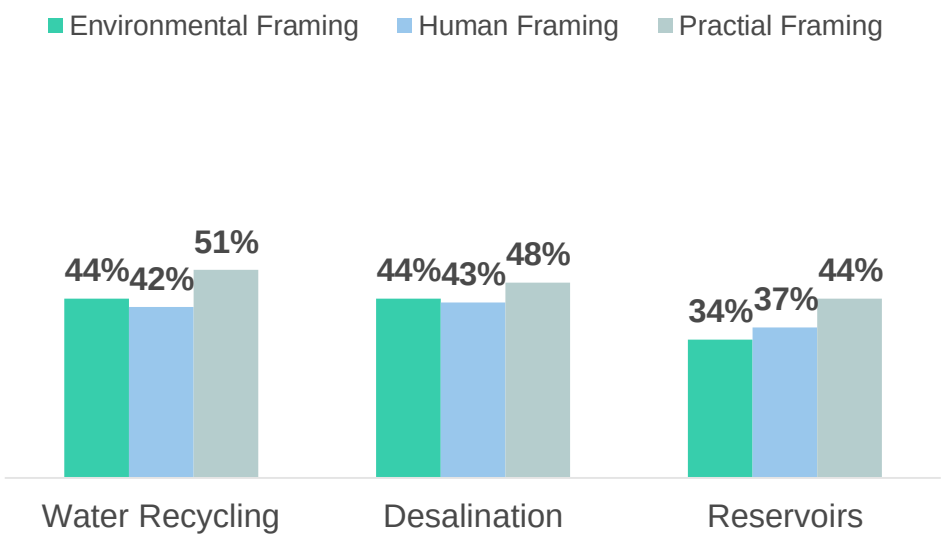


S4 - If you received this letter, how concerned would you be about this change of your water supply? Base: All respondents, HH (n=1762) (n= 605 Water Recycling, Reservoirs) (n=552 Desalination) (n=218 35-54yr olds Water Recycling, Reservoirs) (n=162 35-54yr olds, Desalination)

Levels of concern – highly environmentally aware customers

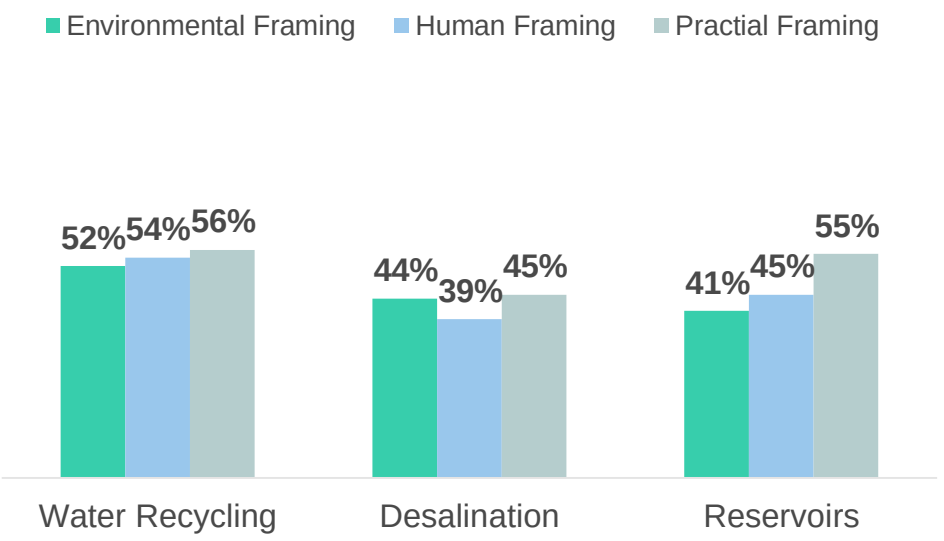
Rated level of concern about change after seeing each framing – Total

Showing % concerned (very + somewhat)



Rated level of concern about change after seeing each framing – highly environmentally aware

Showing % concerned (very + somewhat)



S4 - If you received this letter, how concerned would you be about this change of your water supply? Base: All respondents, HH (n=1762) (n= 605 Water Recycling, Reservoirs) (n=552 Desalination) HH Highly Environmentally Aware (Those with strong agreement with the statements " Protecting lakes, rivers, reservoirs, fish and other aquatic plants and wildlife is really important to me and I am concerned about the impact of climate change on the natural environment in my area) (n=95 Reservoirs) (n=82 Recycling) (n=92 Desalination)

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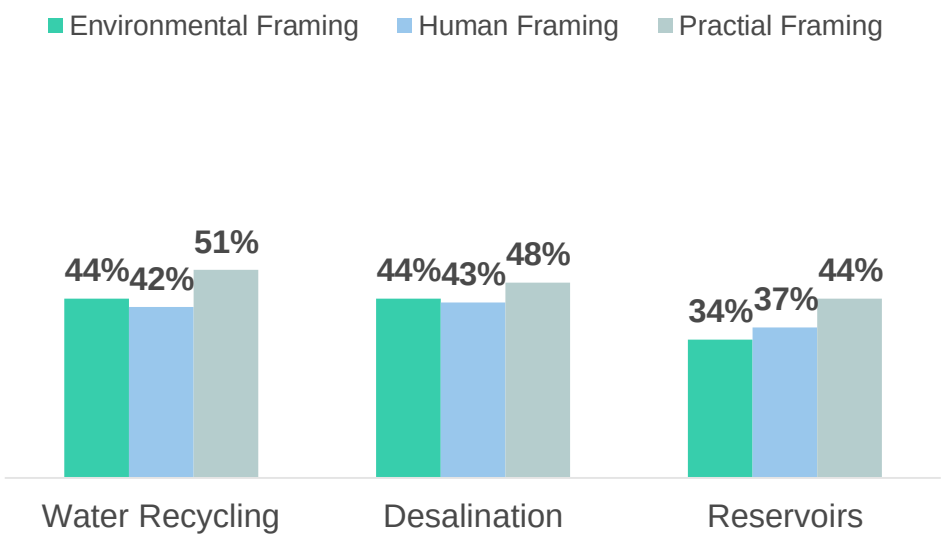
Levels of concern – currently dissatisfied customers

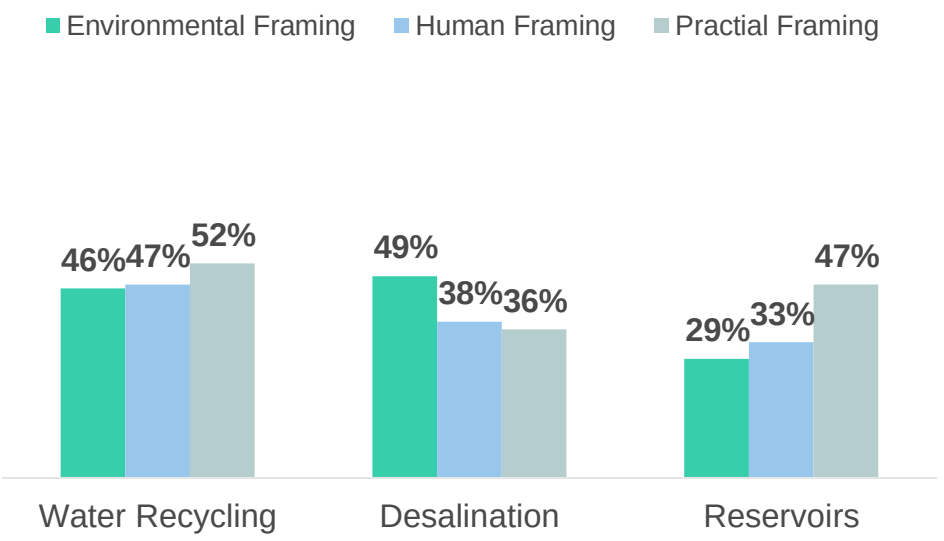
Rated level of concern about change after seeing each framing – Total

Showing % concerned (very + somewhat)



Rated level of concern about change after seeing each framing – dissatisfied customers

Showing % concerned (very + somewhat)

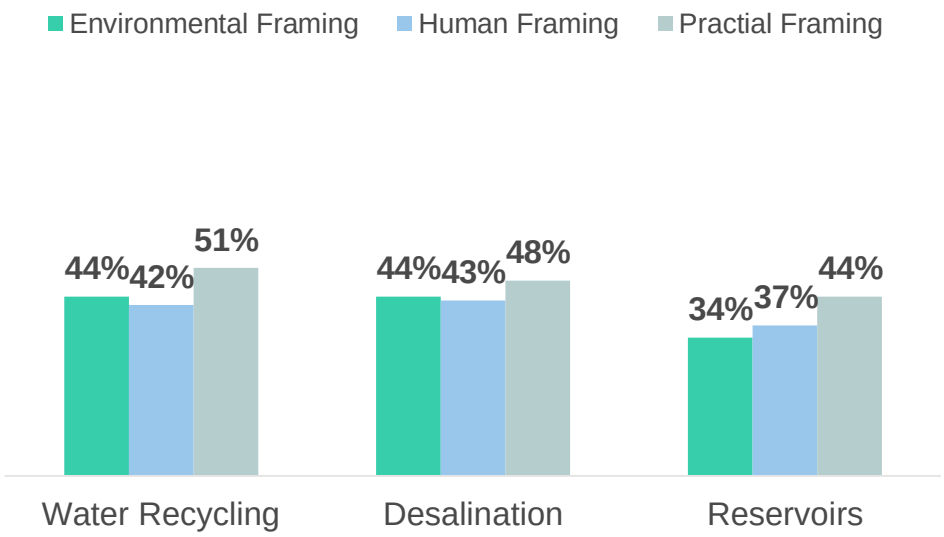


S4 - If you received this letter, how concerned would you be about this change of your water supply? Base: All respondents, HH (n=1762) (n= 605 Water Recycling, Reservoirs) (n=552 Desalination) Customers dissatisfied with current water company (Those rating current company 0-3/10) (n=82 Reservoirs) (n=95 Recycling) (n=83 Desalination)

Levels of concern – read bills in detail

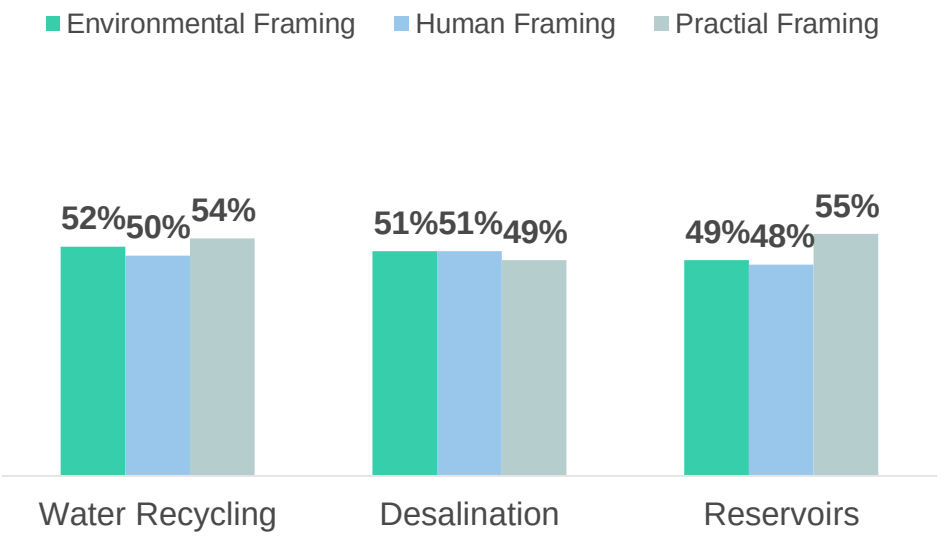
Rated level of concern about change after seeing each framing – Total

Showing % concerned (very + somewhat)



Rated level of concern about change after seeing each framing – read bills in detail

Showing % concerned (very + somewhat)

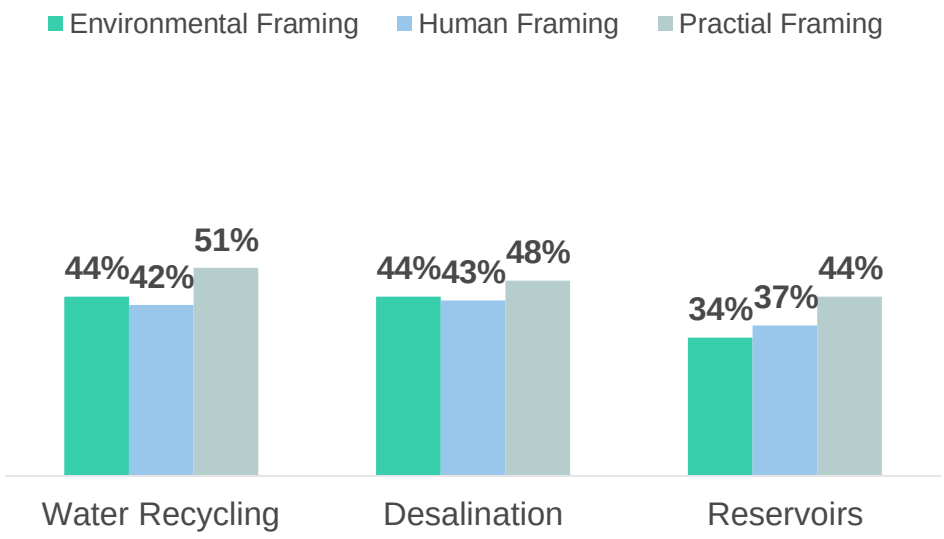


S4 - If you received this letter, how concerned would you be about this change of your water supply? Base: All respondents, HH (n=1762) (n= 605 Water Recycling, Reservoirs) (n=552 Desalination) HH Highly Environmentally Aware (Those with strong agreement with the statements " Protecting lakes, rivers, reservoirs, fish and other aquatic plants and wildlife is really important to me and I am concerned about the impact of climate change on the natural environment in my area) (n=160 Reservoirs) (n=175 Recycling) (n=92 Desalination)

Levels of concern – household v non-household customers

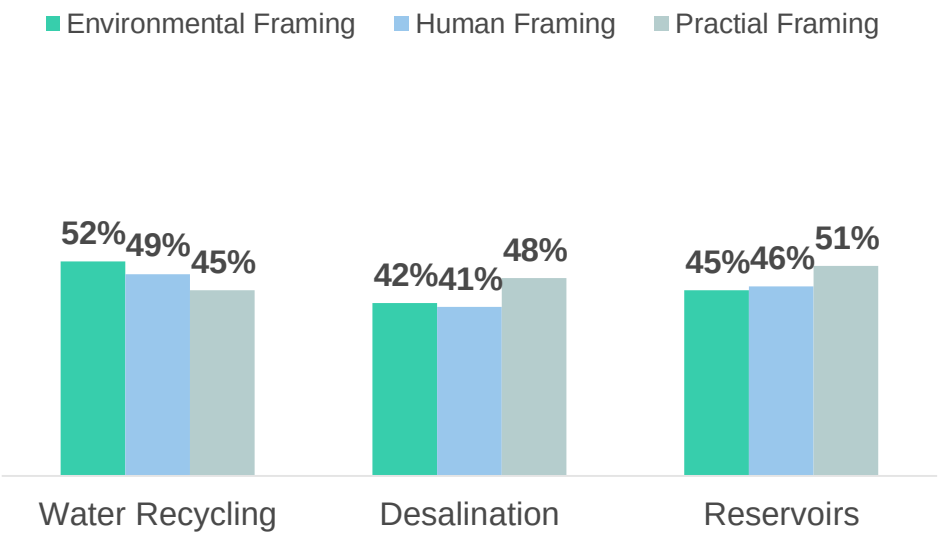
Rated level of concern about change after seeing each framing – Total

Showing % concerned (very + somewhat)



Rated level of concern about change after seeing each framing – non-household customers

Showing % concerned (very + somewhat)



S4 - If you received this letter, how concerned would you be about this change of your water supply? Base: All respondents, HH (n=1762) (n= 605 Water Recycling, Reservoirs) (n=552 Desalination) NHH (n=198) (n= 67 Water Recycling, Reservoirs, Desalination)

Full communications preferences

Communications Timing

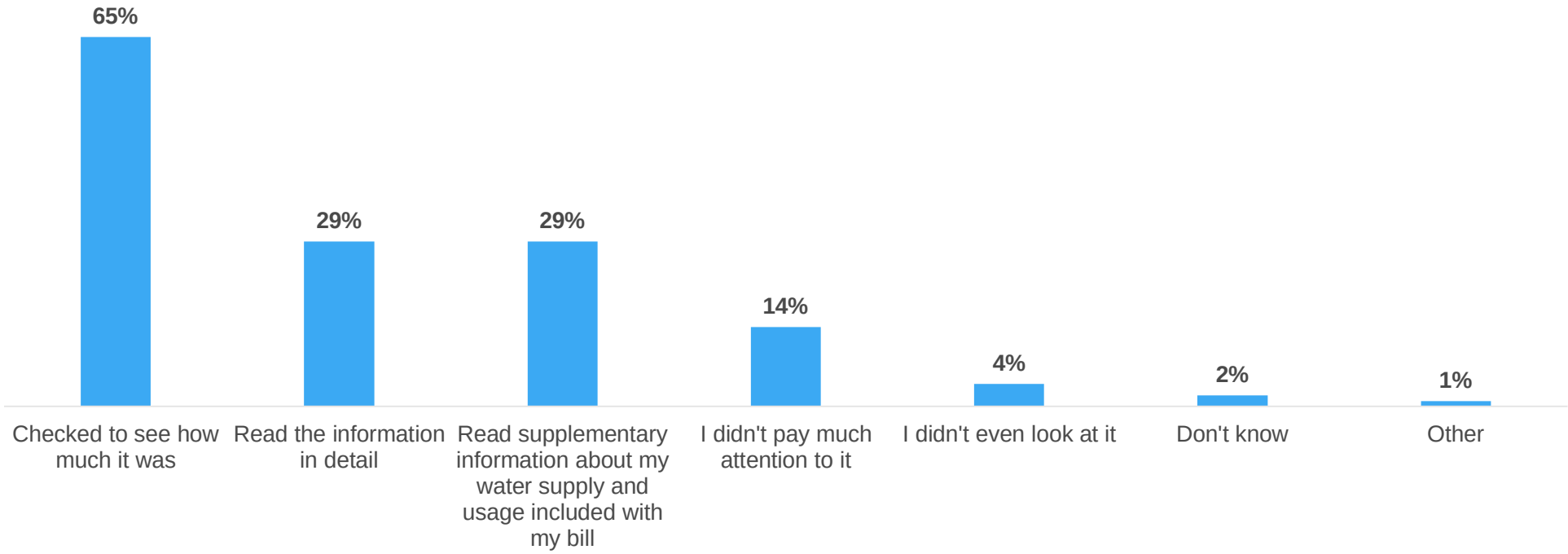
Communications Channel	Only after the change has already occurred	A few days before the change	Two weeks in advance	One month in advance	Three months in advance	Six months in advance	A year in advance	Three years in advance
E-mail	29%	52%	51%	52%	49%	43%	37%	30%
With my next water bill (Even if this was at a later date)	26%	14%	16%	19%	22%	26%	29%	34%
Letter separate from my water bill	19%	33%	42%	55%	59%	57%	55%	53%
WhatsApp/text message	26%	27%	21%	13%	11%	11%	9%	6%
Information in Local media	23%	11%	10%	11%	11%	11%	16%	33%
Telephone call	20%	12%	10%	8%	5%	7%	8%	9%
Online Video [e.g YouTube/TikTok video]	6%	5%	5%	3%	4%	6%	7%	9%
Social media post	19%	10%	10%	7%	7%	8%	8%	8%
Face-to-face at an event organised by the water company to discuss the changes	16%	5%	6%	5%	5%	5%	9%	18%
TV / radio advert	3%	10%	9%	9%	7%	9%	11%	17%

S9. [thinking about the times you would want to be notified of a change of supply] What formats would you want to receive this information in at each point? Base: Respondents selecting each communication timing, HH (n=31-797)

Bill behavior – Household customers

When you received your last household water bill, which of the following did you do?

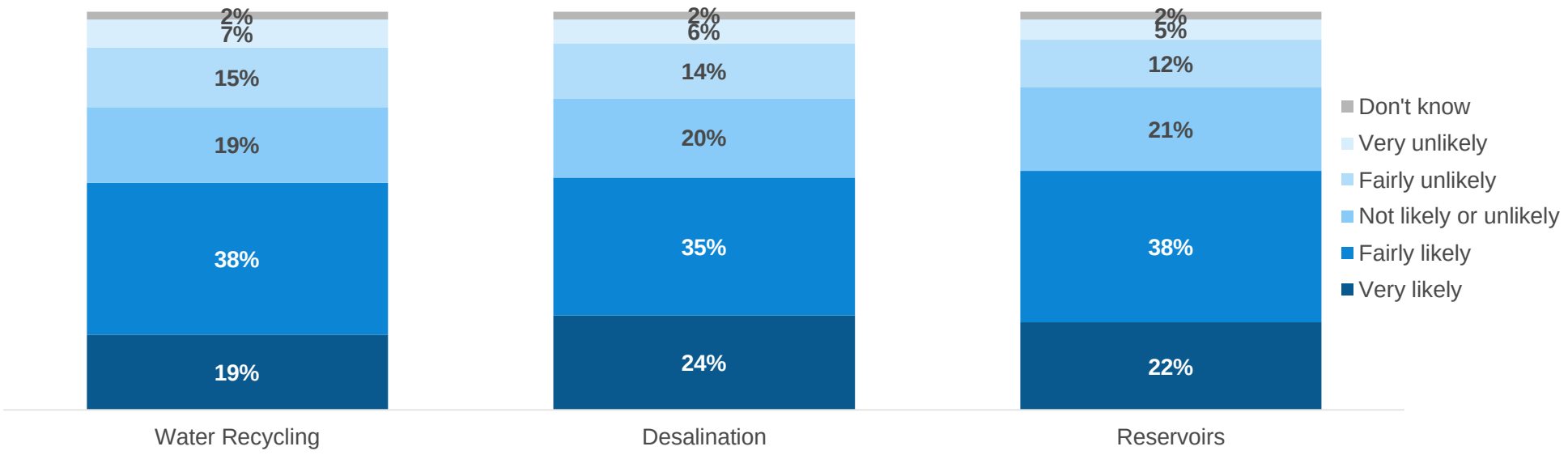
(% Selecting each option – Multiple selections possible)



B7. When you received your last household water bill, which of the following did you do? Base = All respondents who are bill payers (n=1629).

A majority of respondents think that they would click through to look at additional information – consistent across sources

How likely would you be to click through and look for more information?
(% Selecting each response)



S10 Looking at the information provided, more information on this water source change is available through www.watersourcechange.co.uk. How likely would you be to click through and look for more information?

Base; All Household Responses (n=1762)

Thank you

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