West Country Water Resources customer research reports

Summary report June 2022

Qualitative research report May 2022

Quantitative research report May 2022

Wessex Water quantitative research results May 2022

Business plan 2025-2030

Wessex Water
YTL GROUP

FOR YOU. FOR LIFE.

Customer Research to Inform the Best Value Water Resource Plan for the South West

Summary Report

West Country Water Resources Group (WCWRG)

June 2022

10F Printing House Yard
London E2 7PR

+44 (0) 20 7580 5383
eftec@eftec.co.uk
eftec.co.uk

This document has been prepared for West Country Water Resources Group (WCWRG) by:

Economics for the Environment Consultancy Ltd (eftec)
10F Printing House Yard
Hackney Road
London E2 7PR
www.eftec.co.uk

in association with

ICS Consulting Ltd
Pear Tree House, Main Street
Little Smeaton, North Yorkshire
WF8 3LG
www.icsconsulting.co.uk

Study team:

Jake Kuyer
Allan Provins
Sandra Randall (ICS)
Scott Reid (ICS)
Conor Lawrenson (ICS)
Jo East (eftec associate)
Ali Chalak (eftec associate)
Boris Babic (eftec)

Disclaimer

Document evolution

Final Report	21/06/2022	Reviewed by Allan Provins

This report is based on eftec's Version 3 – January 2021 report template.

Executive summary

Background

West Country Water Resource Group (WCWRG), formed in 2017, is the alliance of the three water companies that supply the South West of England – Bristol Water, South West Water including Bournemouth Water, and Wessex Water. The group is responsible for producing the long-term strategic plan for managing water resources in the region across public and non-public water supply.

Research approach

The study used a combination of qualitative (deliberative groups) and quantitative research (online survey) methods – carried out between June 2021 and March 2022 - to develop the evidence base on customer priorities and preferences for the regional plan. It provides a sound basis for understanding customer views, including support for the plan and insight on the refinements and adjustments that could make it more appealing, particularly in relation to the trade-off between risk/resilience – environment – and cost.

Key findings

Overall feedback from customers participating in the research was positive. There was a high level of interest in the topic area and findings from both components of the research show a good level of support for the outcomes and targets that the regional plan is aiming to achieve:

- **Drought resilience.** Customers were aware of the future water supply challenges in the South West, although had limited understanding about the impacts of extreme drought. Severe water use restrictions like rota cuts were perceived as difficult to cope with and generally unacceptable.
- **Environmental ambition.** Customers see water in the environment as a precious resource and there was a strong preference for the plan to go beyond the minimum requirements for environmental protection to provide even greater benefit for nature and wildlife.
- **Trade-offs**. The majority of customers supported higher frequency of less severe restrictions such as hosepipe bans and the potential inconvenience it would cause, if this would contribute to keeping more water in the environment and protecting sensitive habitats.
- **Timing of investment.** Customers favoured earlier investment in new supply options, even if this had increased risk that they may not be needed, or they could be wrong size. For customers the benefits or acting early and being prepared outweighed the potential benefit of waiting for more certainty in the future before acting.
- **Option types.** No supply and demand options for the plan were unacceptable to customers. However, supply options were seen as more reliable, because of the uncertainties associated with demand reductions and the reliance on sustained behaviour change by customers. Support was highest for reducing leakage, closely followed by new or extended reservoirs.
- **Transfers.** Customers were supportive of sharing water at both national and regional levels, particularly if this helped to better protect the environment in water scarce areas. However, the support was not unconditional – with maintaining aesthetic quality of water for "donors" along with leakage and water saving levels in "recipient" areas being critical considerations.

Contents

1. Introduction

1.1 Long-term plan for water resources

Long-term reliable supply of water is vital to supporting the economy. Water resource planning needs to reflect a changing world. Changing climate, population growth, and growing demand for environmental protection mean that across the UK there are critical challenges – but also opportunities - in developing long term plans. Water companies and stakeholders are working together to develop regional plans that ensure that water supplies are managed and secured over the long term, meeting the needs of households and businesses now, and in the future. Meeting the challenges and opportunities when developing a regional plan requires an understanding of the views and preferences of customers, to ensure that the policy at the heart of water resource plans continues to deliver for customers and stakeholders alike.

West Country Water Resource Group (WCWRG), formed in 2017, is an alliance of the three water companies that supply the South West of England – Bristol Water, South West Water including Bournemouth Water, and Wessex Water. Working with a range of supporting organisations linked to the water environment, WCWRG is responsible for producing the long-term strategic plan for managing water resources in the region across public and non-public water supply.

The WCWRG companies have already engaged with customers and stakeholders – through PR19 - and as part of their business-as-usual activities. This study builds on this existing insight to further develop customer and stakeholder evidence to inform the development of the regional water resource plan. The overall purpose is to support WCWRG in formulating the best value regional plan for the South West. This report summarises the main findings from customer research activities carried out in 2021 – 2022 using a combination of qualitative and quantitative methods (Table 1.1).

Table 1.1: WCWRG customer research scope

Qualitative Research	Quantitative Research
• Implemented online between June - July 2021. • Deliberative format with 66 household customers, with 8 groups meeting over two sessions. • Groups were differentiated by socio-economic group, age, and current vs. future bill payers. • Single group of non-household customers also conducted with a cross section of key sectors, including hospitality and service industry, tourism, developers, agriculture, and public services. • Research focus areas were supply resilience, best value planning, supply and demand options, sharing water, and policy issues. • Participants completed a pre-reading exercise to develop understanding, along with a mini-water resource planning exercise between groups.	• Online survey in February - March 2022, with a regionally representative samples of 1,504 household and 304 non household customers. • Survey focused on preferred scenarios for the regional plan, defined in terms of the key outcomes and associated constraints: – Risk of severe water use restrictions during drought – Protecting and improving the environment – Reducing carbon emissions – Reducing leakage – Reducing per capita consumption (PCC), and – Impact on customer bills • Main results are "preference weights" the quantify the relative importance of the outcomes and constraints to customers.

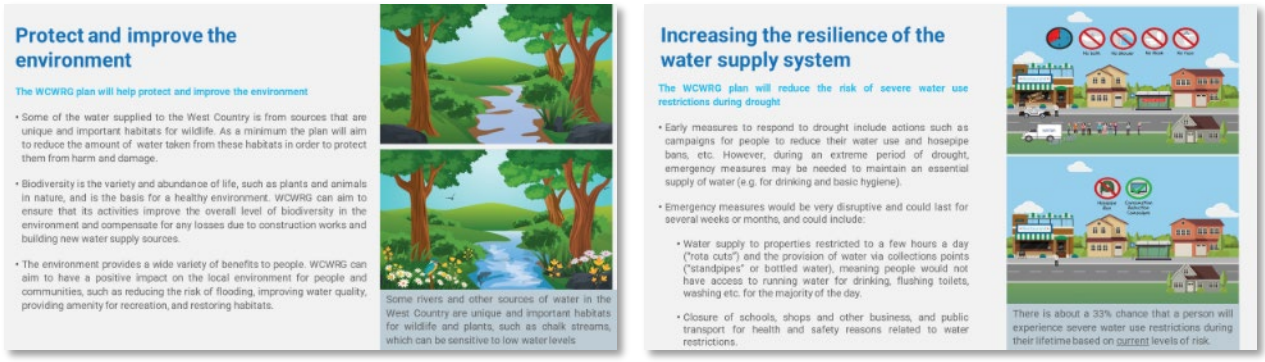
1.2 Research approach

The combined research approach has provided a rich understanding of customer views, preferences, and priorities across eight broad topic areas:

- **Drought resilience** – preferences for further reducing the risk of drought measures (e.g., hosepipe bans) and emergency drought restrictions (e.g., rota cuts/standpipes) being needed;
- **Environmental ambition** – support for investment beyond minimum requirements to reduce the dependency of the water system on sensitive habitats and river and groundwater sources overall;
- **Wider societal benefits** – preferences for the broader public value that can be delivered by the plan, including carbon savings, health and wellbeing, and amenity and recreation benefits for communities;
- **Risk** – attitudes to the level of risk and resilience to future uncertainties and pressures from population growth, consumption levels, weather patterns and climate;
- **Trade-offs** – views on the constraints on the plan in terms of the acceptable/unacceptable trade-offs between risk, service levels, dependency on the environment, and bills
- **Timing** – views on the balance of early investment to reduce risk versus future investment to maintain customer bill levels in the short term;
- **Option types –** preferences for individual supply and demand options and the overall balance between them within the plan; and
- **Inter-company transfers** – views on sharing water with neighbouring companies or further afield, as a "suppliers" or "recipients".

Research materials were developed and tested in line with good practice for customer research, along with input and review from the WCWRG steering group (Figure 1.1). Further information on the research methodologies and results are provided in the respective full reports for the qualitative[1] and quantitative research components[2].

Figure 1.1: Example research materials – quantitative research



Note: Examples shown are excerpts from the online survey, explaining the context for the long-term plan for the region in terms of resilience and environmental ambition. See Quantitative research report for further detail.

[1] ICS and eftec (2022) Customer Research to Inform the Best Value Water Resource Plan for the South West, Qualitative Research Report West Country Water Resources Group (WCWRG), May 2022.

[2] eftec (2022) Customer Research to Inform the Best Value Water Resource Plan for the South West, Quantitative Research Report West Country Water Resources Group (WCWRG), May 2022.

2. Main findings

2.1 Drought resilience

Customers recognised that water resources are limited but also that the day-to-day use of water around the home tends to be taken for granted. Nevertheless, there was an overall awareness of future pressures and challenges for water supply in the region. In the qualitative research sessions, participants' awareness tended to be focused on challenges arising from increasing demand for water, with lower awareness of pressures leading to reduced availability and supply in the future.

Customers were generally comfortable and accepting of the need to impose less severe water restrictions – such as hosepipe bans - if the situation required it.

"I think you wouldn't have much of a moan for a hosepipe ban. It's not a necessity to clean your car, water your garden."

Male, Aged 18-45, SEG ABC1, South West Water

Understanding of what could happen in an extreme drought situation, though, was limited. When introduced in the qualitative research, participants tended to be initially surprised that severe water use restrictions such as rota cuts could be imposed in the UK. That said, there was an appreciation – also found in the quantitative research – of the level of disruption that could be caused to day-to-day life. Generally, non-household customers had a slightly stronger appreciation of the potential impacts (around 8 in 10 at least "somewhat aware") compared to household customers (around 7 in 10 at least "somewhat aware").

The majority of customers felt that severe water use restrictions would be difficult to cope with and therefore were generally not acceptable. Limited availability of running water (just 2 - 4 hours a day) tended to be highlighted as particularly challenging. Non-household customers also keenly recognised the potential detriment to their businesses that prolonged drought and imposition of severe water use restrictions could have.

"I didn't realise how drastic it could get."

Female, Aged 18-24, SEG C2DE, South West Water

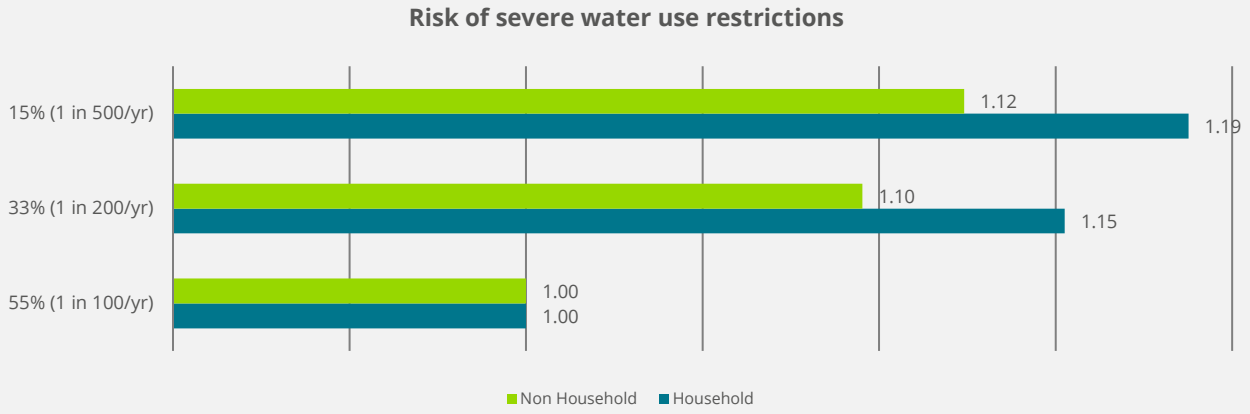
"I don't think that people would actually be able to cope with it if I'm honest. It's kind of like the lockdown, there was a lot of people who struggled with it and I think this would be another one of them that people would just struggle to be able to handle."

Male, Aged 18-45, SEG ABC1, Bristol Water

Whilst both the qualitative and quantitative research components demonstrated that customers have – with some level of prompting – a good appreciation of the impacts of severe restrictions, there was not an overwhelming view that the target level of resilience for the plan should be 1-in-500 years (15% lifetime chance). In the qualitative research, participants were comfortable with reductions in the level of risk level beyond 1-in-200 (33% lifetime chance), but not necessarily all the way to 1 in 500. A similar view was evident from the quantitative research, where the perceived benefit of moving from a 1-in-200 to a 1-in-500 risk was relatively marginal for respondents (Box 2.1).

Box 2.1: Customer preference for reducing risk of severe water use restrictions

The chart below presents customer preference weights for the level of drought resilience (risk of severe water use restrictions) targeted by the regional plan. Higher values indicate a stronger level of preference, showing the outcomes/targets that were most preferred by household and non-household respondents.



The quantitative research results show that for both household and non-households there is relatively marginal additional weight placed on achieving 1-in-500 risk for severe water use restrictions (vs. 1-in-200), although it is the most preferred risk level overall.

2.2 Environmental ambition

The environmental ambition for the regional plan resonated strongly with customers and was a key driving factor for the level of support observed for the plan. Whilst customers tended to take for granted their own uses of water, there was a clear distinction that water in the environment was a precious resource that should be protected for wildlife and natural habitats.

"I think we wouldn't be here if it wasn't for the environment, if we don't take care of the environment, we're not going to last either."

Female, Aged 65+, SEG C2DE, Wessex Water

"We should always strive to improve levels of environmental protection"

Female, Aged 18-45, SEG ABC1, Bristol Water

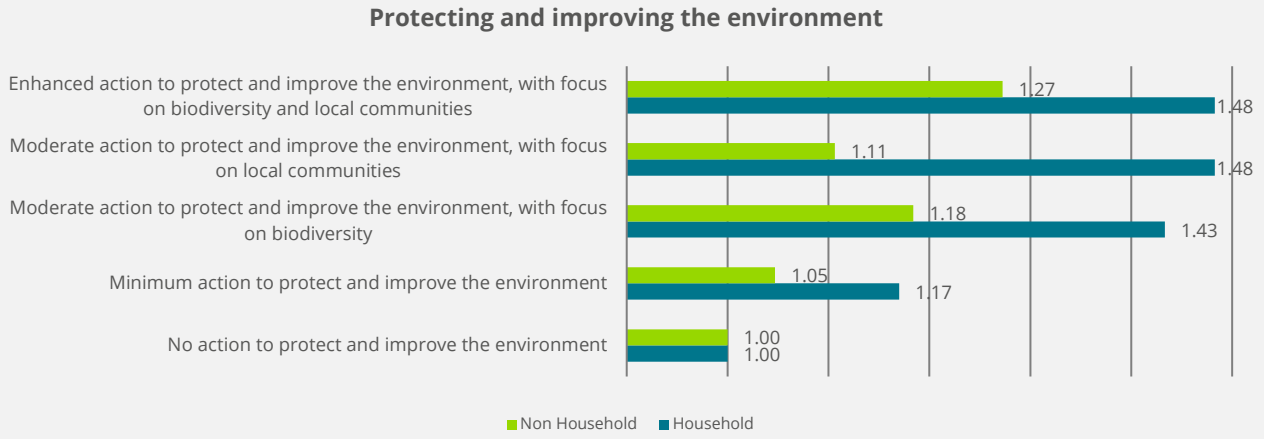
If there's any way to increase protection of the environment, I don't see why you would turn it down"

Male, Aged 18-24, Future customer, Wessex Water

The results from the quantitative research indicate that there is a strong preference on the part of customer to go beyond the minimum requirements for the environmental ambition of the plan. In particular, for it to deliver enhanced outcomes for biodiversity in the region and benefit communities by improving local environmental quality (Box 2.2). This support was backed up by a willingness of customers to take actions to save water in the home if it reduced pressures on sensitive habitats, and a willingness to pay for investments that would help improve the resilience of the water environment to change, particularly from climate and an increasing chance of extreme drought in the future.

Box 2.2: Customer preferences for protecting and improving the environment

The chart below presents customer preference weights for the level of environmental ambition for the regional plan. Higher values indicate a stronger level of preference, showing the outcomes/targets that were most preferred by household and non-household respondents.



The quantitative research results show that for both household and non-household customers there is a clear preference for enhanced environmental outcomes beyond the minimum requirements to the regional plan.

In the qualitative research household customer participants tended to favour an approach that would spread improvements across the region and all catchments, whilst the quantitative research indicated a preference for improvement measures to also include beneficial outcomes for local communities (e.g. access to nature sites, and amenity and recreation benefits). Non-household customers in contrast favoured an approach that would concentrate larger improvements on a smaller number of catchments, with more of a focus on biodiversity outcomes over opportunities that would also improve local-level amenity for communities.

2.3 Trade-offs

The qualitative research directly explored customers views on acceptable and unacceptable trade-offs for the regional plan, presenting three options that varied the balance between the frequency of less severe water use restrictions (e.g. hosepipe ban), the risk of severe of water use restrictions (e.g. rota cuts), and protection for the environment:

- Option 1: More frequent, less severe water restrictions; lower risk of severe water use restrictions; take water from the environment at times of shortages.
- Option 2: More frequent, less severe water restrictions; risk of severe water use restrictions stays the same; no additional water taken from the environment.
- Option 3: No change in frequency of less severe water use restrictions; risk of severe water use restrictions may increase; take water from the environment during shortages

The most preferred option across the groups was Option 2, which was selected by approximately two-thirds of participants (64%). This finding was consistent with overall views on protecting the environment, illustrating the willingness of customers to accept an increased frequency of restrictions that bring limited inconvenience in order to reduce pressure on sensitive surface and groundwater sources. This sentiment was consistent across the groups for each company and also across socio-economic groups. Future customers, though, tended to have a more balanced preference between Options 1 and 2.

"It's less impact on the environment which at the end of the day, if there's a hosepipe ban, there's a hosepipe ban. When my lawn goes brown, it's just something you put up with."

Male, Aged 46+, SEG C2DE, Wessex Water

Results from the quantitative research provide a view on trade-offs in terms of the value to customers, and what customers would be prepared to pay on current bill amounts (i.e. "give up") to secure different aspects of the regional plan outcomes. The greatest value - in terms of household willingness to pay – was observed for protecting and improving the environment (approx. £22 – £28 per household per year for actions over and above minimum requirements). This was followed by drought resilience outcomes and reducing the risk of severe water use restrictions to 1-in-500 years (approx. £9 - £13 per household per year), along with achieving the target for a 50% reduction in leakage by 2050 on time (approx. £7 - £11 per household per year) and reducing per capita consumption to 110 litres per person per day (approx. £2 – 7 per household per day).

2.4 Timing of investment

Customer views on the timing of investments were explored in the qualitative research. Two scenarios were outlined that reflected the overall context for the regional plan in which future demand is uncertain and many supply options take a long time to build and bring online:

- Option 1: Increased risk of hosepipe bans; same risk of severe restrictions like rota cuts; investment in new supply options can be delayed in order to get more certainty about future needs.
- Option 2: Same risk of hosepipe bans; less risk of severe restrictions like rota cuts; investment in new supply options goes ahead, even though there is a risk they may not be needed or the wrong size.

Participants strongly favoured Option 2 (around 9 in 10) and supported investment in regional water resources being progressed, even if there was a risk of incorrect assets being built and associated wasted investment. The preference for not delaying investment was consistent with the views given on reducing the risk of severe water restrictions. It was evident that some participants were reflecting on their recent experiences of the COVID-19 pandemic, which they felt highlighted the need to plan how to respond to events that seem so unlikely they can barely be envisaged. There was a view too, that whilst some aspects for future planning are uncertain, the implications of growing population and changing climate are reasonably well understood and companies should prepare for these eventualities as water is a necessity to everyday life.

"Preparation is key...got to look at COVID."

Female, Aged 18-45, SEG C2DE, Wessex Water

"I think be prepared for the worst rather than getting there and thinking whoops."

Female, Aged 18-45, SEG ABC1, South West Water

"Demand constantly growing, putting measures in place to prepare for this and we have a backup."

Female, Aged 18-24, Future customer, Wessex Water

"Reservoir, implemented now even if demand might not be there. Come 20 years down line, now prepared and no rota cuts. Ahead of the game."

Male, Aged 18-24, Future Customer, Wessex Water

Findings from the quantitative research indicated that targets for net zero carbon and increased effort to reduce leakage tended to be secondary factors for customers. Nevertheless, household respondents had a clear preference for the 50% reduction in leakage target to be achieved by 2050. Non-households, in contrast, did not favour enhanced effort over continuing levels of repair and maintenance. Whilst there was a good level of support from respondents to achieve net zero across operations by 2050, there was no over-riding preference for achieving reductions earlier. In general, reducing emissions faster was not seen as the top priority for the plan given other needs around drought resilience and environmental protection.

2.5 Option types

Demand management and supply-side options were discussed in the qualitative research. Participants were provided with a reference pack to review between the 2 sessions. The follow-up explored how different options were perceived and reasons behind participants' preferences.

Overall, no options were seen as unacceptable. Support was strongest for reducing leakage, closely followed by reservoirs, and education and awareness campaigns to reduce demand. In general, supply options were preferred over demand options. There was concern amongst participants as to whether people can be trusted to change behaviours and reduce demand in a sustained way, which strongly influenced their views and preferences for demand options. In contrast supply options were seen as reliable. Participants also recognised that there is a need to use multiple approaches for water resource planning, rather than rely on a single approach or solution.

"One option isn't going to suffice, no? You need multiple things in order to meet the supply and demand that is needed for it, just doing a reservoir isn't gonna be enough, that was my theory."

Female, Aged 18-45, SEG C2DE, Bristol Water

"You've got to go for variants, because if you put all your eggs in one basket, and that basket fails, then you're going to be up the gum-tree, whereas at least if you try all the various options, and therefore it's just going to maximise hopefully your supply."

Male, Aged 65+, SEG ABC1, Wessex Water

"I don't think that there's one best way to do it, and I think that different areas of the country might be suited to a different supply method depending on location and depending on the cost."

Female, Aged 18-45, SEG C2DE, Bristol Water

Reservoirs, pumped winter storage and desalination were the most supported supply options. Participants tended to prefer options that were seen to be reliable and produced large amounts of water. Cost was mentioned as an influencing factor.

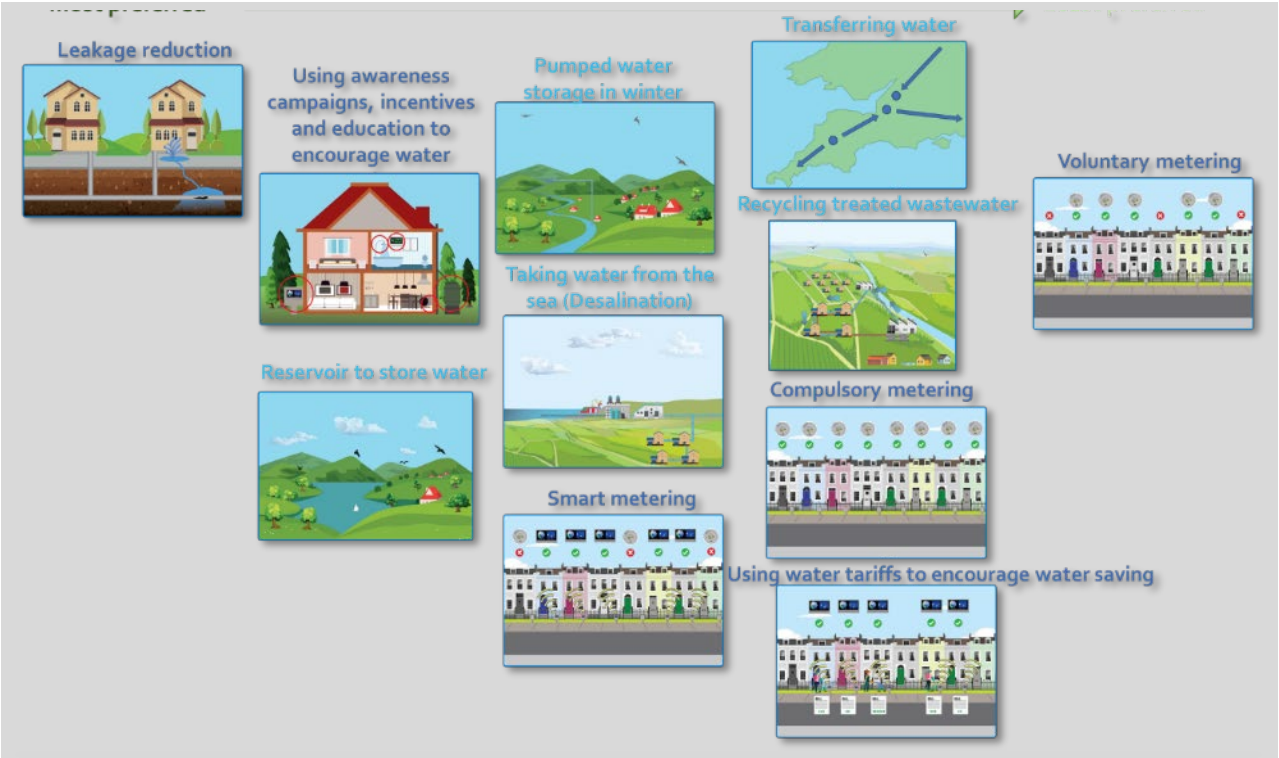
"Transferring water, it's a good idea if there is water available, but if we all went into a drought there wouldn't be the water available. Whereas if you had a reservoir, that's something - and also the reservoir that could be used for other activities for communities and stuff. They could be used for many different things."

Female, Aged 18-45, SEG C2DE, Wessex Water

"I went more for the supply option – again, my thinking was the desalination. I know we don't use it as heavily in this country as others but we're an island nation surrounded by water, and I feel like we should be using that more than most."

Male, Aged 18-45, SEG C2DE, South West Water

Figure 2.1: Qualitative research - participants' support for the supply and demand options



Education and awareness campaigns to encourage reductions in water usage were the most supported demand options. Whilst some participants continued to view leakage as wasteful and a 'no brainer' solution, across the discussions and home task exercises there was indication that some participants had tempered their support in light of other considerations such as feasibility, disruption, and cost.

"The more leaks that are fixed, the less is actually getting wasted, so I was just thinking fix all the leaks and the water builds up itself."

Female, Aged 18-45, SEG ABC1, Bristol Water

"I know it's quite costly, but I think surely in the long run, you're going to save money, aren't you? Save the water, which is the most important thing here, really."

Female, Aged 65+, SEG C2DE, Wessex Water

Support for voluntary metering was consistently low, with compulsory and smart metering preferred. Whilst this appears to be a change in attitudes given historical resistance to compulsory metering, it is less surprising in the context of discussions between participants. In particular – as noted previously - whether people can be trusted to reduce demand consistently. Participants also typically expressed the view that reducing demand was down to others, even within their own households.

2.6 Inter-company transfers

Customers were supportive of sharing water at both the regional level and national level. In the qualitative research participants felt that not every company needed to be totally self-sufficient, given that some companies already share resources. Underlying the support was the view that sharing water was a further way that companies could protect the environment.

It's better all round for everybody really if someone's got more water and we can use that and they can transfer it to us, then why not?"

Female, Aged 18–45, SEG ABC1, Bristol Water

"If there's more water in one area than another, to share it around makes a lot more sense than go through the making [of] good water."

Male, Aged 18-45, SEG C2DE, Bournemouth Water

Similar views were evident in the quantitative research, where the majority of respondents (around 80%) agreed with transferring water from areas with excess supply. However, there was a wariness transfers if it meant a region would be highly dependent on supply from elsewhere – with just over half the sample agreeing with the statement that "no area should be dependent on water being transferred in from elsewhere".

Support for transfers, however, was not unconditional. In both the qualitative and quantitative research, the greatest concern was maintaining the aesthetic quality of water supply in the "donor" area (e.g. taste and hardness vs. switching sources). Other considerations - such as leakage and water saving levels in recipient regions and impact on risk of severe water use restrictions being needed – were fairly evenly rated. Discussion in the qualitative research sessions also showed there was an expectation that recipients of transfers should be responsible in their use of water and meet similar standards to the donor in terms of leakage, water use and metering. Participants also caveated their support in that the transfer should not impose any financial burden on supplier companies (i.e. the recipient pays).

2.7 Overall support for the plan

Overall, both components of the research show that there is a good level of support for the outcomes and targets that the regional plan is aiming to achieve and - particularly in relation to the environmental ambition – a preference for companies to go beyond the minimum requirements.

Notwithstanding the strong support that was observe, participants in the qualitative research wanted affordability to be taken into account when developing regional plans, even though they recognised the need for investment. The key reason was their view that water is a necessity not a luxury. However, views were mixed as to how this should be achieved. External support via government, means tested bills, national pricing, encouraging personal responsibility to reduce usage (e.g. through compulsory metering), and water companies funding investment from profits were all discussed.

"[It's] crucial. Not everyone gets paid the same, some people might not be able to afford to pay a lot of money for water. It's a necessity, and it won't be held against them because you do need water to survive, but not all people can afford it."

Male, Aged 46+, SEG C2DE, South West Water

"It's one of our lower bills. It's essential, we need it, so I imagine it's inevitable like all energy, it's going to go up over time, especially if they're putting in more infrastructure, but again, if the public are seeing a breakdown of what their money's being spent on, how it's improving the infrastructure and not just paying big bonuses, I'm sure the people wouldn't mind."

Male, Aged 18-45, SEG C2DE, Wessex Water

"Cost is going to be an issue for a lot of people, but if you don't pay for it, it's never going to improve - it needs to improve for future generations."

Male, Aged 18-45, SEG C2DE, South West Water

It was evident too that participants also supported investment now that would benefit future generations. Typically, there was an expectation that the cost would be spread over time to limit the bill impact. Some participants flagged their support was conditional on the size of the bill impact.

"I feel like it depends how much more they're paying – I think my nan and grandad for example, I know they probably would put some money towards it but if their bill was going to be going up a lot to pay for stuff that just wouldn't benefit them, I'm not sure how inclined – they possibly would."

Female, Aged 18-24, Future Customer, Wessex Water

"That's the way the system works….I'm paying for people's kids to go to school but I've not got any going to school."

Male, Aged 65+, SEG C2DE, South West Water

"I think I wouldn't mind it as a gradual process because it's helping my children and grandchildren in the future, so I wouldn't mind it gradually. I think if we started with our generation and then built it up as we went along."

Female, Aged 65+, SEG ABC1, Wessex Water

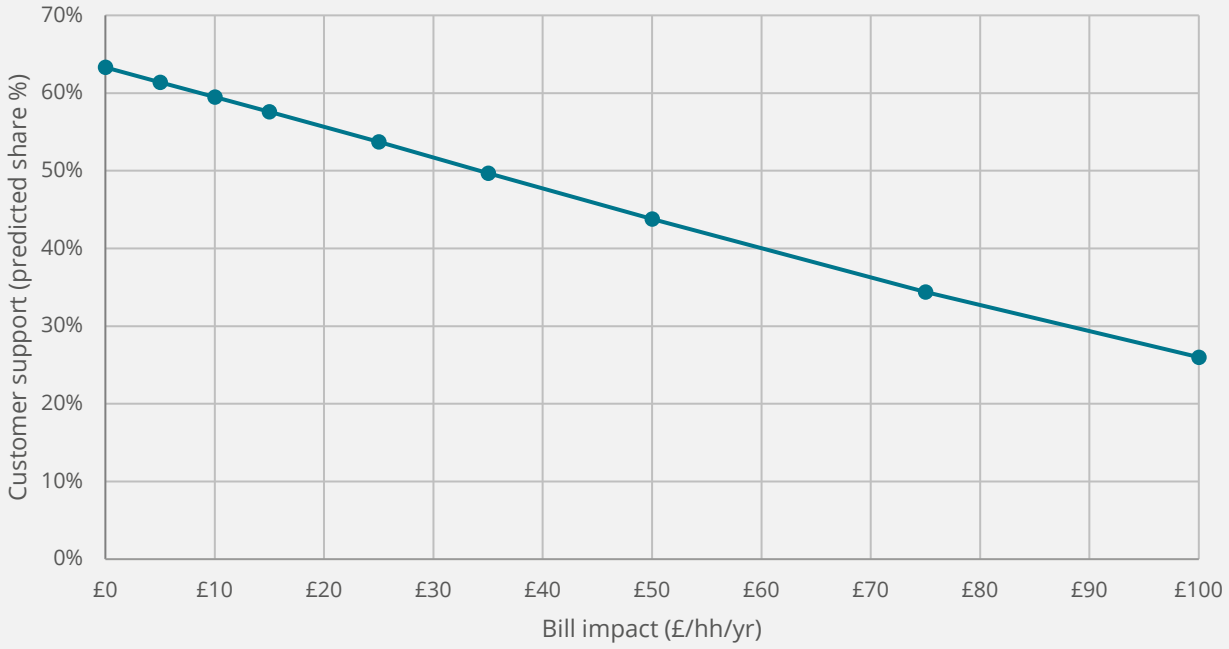
"We've got two kids and if it's going to benefit them as they get older, then I'm all for that. And if the cost is spread out over time, then I'd rather that then think about them struggling unnecessarily down the line if we can have helped beforehand."

Female, Aged 18-45, SEG C2DE, Wessex Water

In the quantitative research, the tipping point, in terms of support for the plan from the majority of customers, was found to be around £30 per year (Box 2.3). Below this a larger share of the customer base would likely see the plan as "value for money". Above it fewer would likely be supportive of the plan, even if it offered enhanced environmental outcomes over the minimum requirements.

Box 2.3: Customer support for the regional plan

The chart below shows the estimated level of support for the regional plan (household customers) at varying levels of bill impact from 2025. At a relatively modest level of annual bill increase (around £5/hh/yr) support for the plan is estimated to be above 60% of the regional customer base. The level of support drops below 50% around a bill impact of £35 per household per year. Less than one-third of customers would support the regional plan if the bill impact was greater than £80 per household per year.



Notes: Regional plan scenario defined as:

- Risk of severe water use restrictions during drought: 1-in-500
- Protect and improve the environment: minimum action
- Reduce carbon emissions: net zero by 2050
- Reduce leakage from pipes: 50% reduction target met by 2050
- Help to reduce the amount of water people use: moderate reduction in use (110l/p/d)

3. Conclusion

In combination the two phases of research carried out for WCWRG provide a wide-ranging view of customers' priorities that will support the development of the best value regional plan for the South West. Almost 1,900 customers participated in the research and overall feedback was positive. There was a high level of engagement and interest in the topic areas covered in the both the qualitative and quantitative research components. The majority of the participants strongly supported WCWRG consulting with customers on water resource planning.

The qualitative research covered a broad scope of topics, covering policy and strategic issues that frame the regional plan and the planning objectives, such as the approach to drought resilience, the balance of supply and demand measures, the level of environmental ambition, along with principles for sharing water, and affordability issues. The deliberative format to allowed participants to develop their understanding of these topics and give well-considered views and contributions to the sessions.

The quantitative research focused on customer preferences for the long-term outcomes and the relative importance of different aspects of the plan. The survey testing stage and respondent feedback indicated that the study results are valid from a customer understanding perspective. The survey produced a rich dataset on customer preferences and the empirical results are robust with a reasonable fit to the data.

Overall, the research provides a sound basis for understanding customer priorities for the regional plan, including support for the plan and insight on the refinements and adjustments that could make it more appealing, particularly in relation to the trade-off between risk/resilience – environment – and cost.

eftec
economics for
the environment

10F Printing House Yard, London EC1Y 2AA

+44 (0) 20 7580 5383

eftec@eftec.co.uk

eftec.co.uk

@eftecUK

Customer Research to Inform the Best Value Water Resource Plan for the South West

Qualitative Research Report

West Country Water Resources Group (WCWRG)

May 2022

10F Printing House Yard
London E2 7PR

+44 (0) 20 7580 5383
eftec@eftec.co.uk
eftec.co.uk

This document has been prepared for West Country Water Resources Group (WCWRG) by:

Economics for the Environment Consultancy Ltd (eftec)
10F Printing House Yard
Hackney Road
London E2 7PR
www.eftec.co.uk

in association with

ICS Consulting Ltd
Pear Tree House, Main Street
Little Smeaton, North Yorkshire
WF8 3LG
www.icsconsulting.co.uk

Study team:

Sandra Randall (ICS)
Scott Reid (ICS)
Conor Lawrenson (ICS)
Jo East (eftec associate)
Allan Provins (eftec)
Jake Kuyer (eftec)

Disclaimer

Document evolution

Draft report	31/08/2021	Reviewed by Allan Provins
Final report	17/05/2022	Reviewed by Allan Provins

Executive Summary

The long-term, reliable supply of water is vital to supporting our economy. Water resource planning needs to reflect a changing world. Changing climate, population growth, and growing demand for environmental protection mean that across the UK, and the South West in particular, there are critical challenges – but also opportunities - in developing long term plans. Water companies and stakeholders are working together to develop regional plans which ensure that water supplies are managed and secured over the long term, meeting the needs of households and businesses now, and in the future. Meeting the challenges and opportunities when developing these regional plans requires an understanding of the views and preferences of customers, to ensure that the policy at the heart of water resource plans continues to deliver for customers and stakeholders alike.

West Country Water Resource Group (WCWRG), formed in 2017, is an alliance of the three water companies that supply the south west region of England – Bristol Water, South West Water including Bournemouth Water and Wessex Water. Working with a range of supporting organisations linked to the water environment, WCWRG is responsible for producing a long-term, strategic plan for managing water resources in the region across public and non-public water supply.

The WCWRG water companies have already engaged with customers and stakeholders – through PR19 and as part of their business-as-usual activities. This project builds on this existing insight to further develop customer and stakeholder evidence to inform and support the development of the regional water resource plan. The overall purpose of this research is to support WCWRG in formulating the best value regional plan for the South West.

Overview of the deliberative research process

The deliberative research was implemented online in June and July 2021 using the VisionsLive platform. A total of 66 household customers participated in the research, split into eight groups, with each group meeting over two sessions. There were two groups per water company (differentiated by SEG with mixed ages), plus specialist groups of future customers (non-bill payers aged 18-24 years) and older customers (aged 65+), three customers from each company recruited for each specialist group.

The research also included a single group of non-household customers, selected to provide a cross section of key sectors, including hospitality and service industry, tourism, developers, agriculture, and public services. The participants were from companies ranging from one to two employees to 150 employees.

The research approach, including detailed research questions, and the research materials (pre-read, topic guides, showcards etc.) were all developed with input from the WCWRG Steering Group and included feedback from the companies' CCW. The agreed areas of focus are summarised in Table S.1.

Table S.1: Areas of focus for the deliberative research

High-level topic	Main areas of focus for understanding customer views
Supply resilience	Focus on: • Customer understanding of future pressures, including demand increases and environmental protection and improvement • Customer support for reducing severe supply risk from 1 in 200 to 1 in 500 years
Best Value Planning	Focus on: • Customers' priorities for the best value plan (based on the four WCWRG value factors) • Understand customers' views on trade-offs between value planning factors and any unacceptable trade-offs • Understand customer support for planning principles such as the level of environmental ambition, and national leakage and per capita consumption targets • Customers' views on the timing of investment, given the balance between supply risk and planning uncertainty
Supply and Demand Options	Focus on: • Customers' preferences for key supply and demand options, including the trade-off between supply and demand. • Customer willingness to reduce demand and indications of the extent of that reduction
Sharing Water	Focus on customers' willingness to share/transfer water: • Within and outside the region, and with other sectors such as farming • Understand any constraints or barriers to sharing water
Policy issues and constraints	Focus on customers' views on how regional planning should take account of: • Affordability and inter-generational fairness • Inter-area fairness

The sessions featured a mix of discussion topics and exercises, including voting. The voting exercises were designed to both aid engagement and capture the strength of feeling of the participants, particularly those who may be quieter in the group environment. The outputs from the voting exercises are good indicators of participant views, in support of the qualitative research. Household customers also completed some pre-reading to build their background understanding, and between session 'home-task' exercises, including a mini water resource planning exercise.

Overall participant feedback on the sessions was positive, indicating a high level of engagement in the research and interest in the topic areas. The majority of participants were also strongly supportive of WCWRG consulting with customers on water resource planning.

Key findings – Water resources and supply resilience

Participants recognised that water resources are limited, with the majority considering that they could use less water, although responsibility was frequently placed on others within their households. There was a consensus that participants took water for granted. In contrast over half of non-household participants stated that their business would struggle to use less water. Participants were able to identify future pressures on water resources, focussing on challenges from increasing demand with lower awareness of any pressures leading to reductions in supply.

Customers typically accepted the imposition of less severe restrictions - hosepipe bans and non-essential use bans - provided the situation required it. Their initial reaction to severe water restrictions – rota cuts and/or standpipes – was surprise that such restrictions could be imposed in the UK. For most participants, severe restrictions would be difficult to cope with and are not generally acceptable, although a significant minority were more confident that they could cope for a period of time. Non-household customers mostly considered that severe water restrictions would have a detrimental impact on their businesses.

Overall participants supported a reduction in the risk of severe restrictions from the current standard of 1 in 200 years. However, there was no clear preference as to whether the reduction in risk should be to the extent of 1 in 500 years, or some point in between.

Participants supported protecting the environment at times of water shortages, even if it meant accepting more frequent imposition of less severe restrictions such as hose pipe bans, and no reduction in the risk of severe water restrictions.

Key findings – Best Value Planning

Best value planning factors

Participants were presented with the four best value planning factors used by WCWRG in developing their regional plan (see Table S1.2).

Customers considered all four best value planning factors to be important and often struggled to decide the relative ranking. Participants also linked factors, for example if demand is reduced it will also improve supply resilience or protect the environment, and so their priorities included an element of personal preference for delivery modes.

Supply resilience was ranked highest priority on average for household customers, with little difference between the next two factors – improving the environment and reducing the demand for water. Benefitting and affordable for society was the lowest average priority.

Table S1. 2: WCWRG best value planning factors

Factors	Examples of how the factors are assessed
Benefitting and affordable for society	• Cost to customers and customer affordability • Intergenerational equity – costs are spread over time across different generations • Meeting the needs of other stakeholders and water users
Improving the environment	• Reducing the amount of water taken from environmentally sensitive water sources • Reducing carbon emissions/energy use • Enhancing the environment e.g. biodiversity improvements
Improving supply resilience	• Reducing the risk of severe water restrictions • Reducing the frequency of temporary use restrictions, hose pipe bans • Improving the resilience of the water supply system to other risks such as flooding and extreme cold weather
Reducing the demand for water	• Reducing the amount of water each person uses • Reducing leakage • Reducing water used by businesses, industry, and agriculture

Unprompted participants did not identify any factors that would change their priorities. When probed specifically regarding potential costs, some recognised that their support for supply resilience or environmental protection may decrease if costs were considered too high, or if it impacted affordability for lower income households. Mostly participants confirmed that their priorities for the best value planning factors would remain. Similarly, their priorities typically did not change over the next 5-10 years compared to a year 2050 horizon, although some recognised that reducing the demand for water may decrease in priority if progress is made.

Environmental ambition

Protecting the environment was observed to be a driving factor for participants across all groups, with water recognised as a precious resource for people, wildlife, and habitats.

Participants demonstrated strong support for improving the environment in the context of water resources. The message was consistent across the various ways we asked customers including their broad preferences, trade-offs and through the mini water resource planning exercise. Household customers typically preferred environmental improvements to be spread across all catchments, whereas non-household customers preferred concentrating larger improvements on a smaller number of catchments.

Regional planning

Participants support water companies working together to deliver a wider planning approach, with a preference for national planning over regional planning. Customers recognised that there may be benefits from considering water resources on a regional or national basis, but their support was caveated, with participants citing it was dependent on no detrimental impact on themselves and cost implications.

Timing of investment

Participants strongly support investment in regional water resources being progressed in order to reduce the risk of water restrictions, even if there was an associated risk of incorrect assets being built and wasted investment. Even the minority of customers who favoured a more 'wait and see' approach to investment still tended to expect plans to be prepared so that they were ready to be implemented when required.

Key findings – Supply and Demand Options

No supply or demand options were considered unacceptable to customers. Support was strongest for reducing leakage, closely followed by reservoirs, and using education and awareness campaigns to reduce usage. Voluntary metering was the least supported option.

In general supply options were preferred over demand options. There was concern amongst participants as to whether people can be trusted to change behaviours and reduce demand in a sustained way, which strongly influences their views and preferences for demand options. In contrast supply options were seen as reliable. Customers also recognise that there is a need to use multiple approaches for water resource planning, rather than rely on a single approach or solution.

Supply options

Reservoirs, pumped winter storage and desalination were the more supported supply options. Participants preferred supply options that were seen to be reliable and produced large amounts of water. Cost was mentioned most often as an influencing factor.

Demand options

Reducing leakage and using education and awareness campaigns to encourage reductions in water usage were the most supported demand options. Whilst some participants continued to view leakage as wasteful and a 'no brainer' solution, across the discussions and home task exercises there was indication that some participants had tempered their support in light of other considerations such as feasibility, disruption, and cost.

Support for voluntary metering was consistently low, with compulsory and smart metering preferred. Whilst this appears to be a change in attitudes given historical resistance to compulsory metering, it is less surprising in the context of discussions between participants. In particular whether people can be trusted to reduce demand consistently. Participants also typically expressed the view that reducing demand was down to others, even within their own households. Both metered and unmetered participants scored the option lowest - their average 'supportive' score consistent at 5 out of 10.

Proposed national policy targets

Views on the proposed national target to reduce water use to 110 litres/person/day by year 2050 were mixed, linked to participants' perceptions regarding whether they trust demand reduction to be sustainable. They also highlighted concerns regarding the enforcement of any target.

Participants strongly supported leakage reduction, but some did question what was realistic in terms of a baseline level of leakage and cost. At this stage in the planning cycle, it was not possible to probe support for the specific 50% target without more detailed information regarding costs and impacts such as disruption. The application of a set target may be an area for further consultation with customers once more information is available, particularly around baseline levels and differences between areas.

Key findings – Sharing water

In principle, participants were supportive of sharing water resources, but they expected recipients to be responsible in their use of water and meet similar standards. Customers also caveated their support in that the transfer should not impose any financial burden on supplier companies ('recipient pays').

When asked about specific constraints on sharing water, participants strongly supported sharing to protect the environment. They expected that recipient areas should use water responsibly and meet similar standards in terms of leakage, water use and metering. Support was lower if it could affect water quality in terms of taste or hardness, particularly amongst non-household customers.

Support for sharing water resources with sectors other than the public water supply was more nuanced, and dependent on how essential the sector is perceived to be. Sectors such as agriculture or power were highlighted as acceptable, but sharing water resources with industry and other users generated more mixed responses.

Key findings – Policy issues and constraints for regional planning

Participants agreed that affordability should be taken into account when developing regional plans, even though they recognised the need for investment. The key reason was their view that water is a necessity not a luxury. However, views were mixed as to how this should be achieved. External support via government, means tested bills, national pricing, encouraging personal responsibility to reduce usage (e.g. through compulsory metering), and water companies funding investment from profits were all discussed.

Customers supported investment now that would benefit future generations. They typically expected the cost to be spread out over the period to limit the bill impact, and some customers flagged their support was conditional on the size of the bill impact.

Participants did not express a strong view regarding how differences of view should be accounted for in regional planning, discussions typically reverting to the potential impact on bills.

Contents

1. Introduction

Setting the scene

The long-term, reliable supply of water is vital to supporting our economy. This is particularly important in the West Country especially in the summer months due to the high levels of tourism[3]. Whilst the region has not had to experience any severe restrictions that limit water availability since the 1976 drought, with a changing climate, there is an increased risk of severe droughts.

Fundamentally, water resource planning needs to reflect a changing world. Changing climate, changing weather patterns, population growth, and growing demand for environmental protection mean that across the UK, and the South West in particular, there are critical challenges – but also opportunities - in developing long term plans regionally and collaboratively. In the water industry, companies and stakeholders are working together to develop regional plans which ensure that water supplies are managed and secured over the long term, meeting the needs of households and businesses now, and in the future.

These regional plans need to balance these pressures including increasing levels of water stress, drought and supply resilience, increasing demand for an enhanced and protected environment, and affordability. How these challenges and opportunities are best addressed requires an understanding of the views and preferences of customers, to ensure that the policy at the heart of water resource plans continues to deliver for customers and stakeholders alike.

1.1 Background

West Country Water Resource Group (WCWRG) - formed in 2017 in response to the wider national need for a more strategic approach to water resources management - is an alliance of the three water companies that supply the South West region of England (Bristol Water, South West Water including Bournemouth Water and Wessex Water). Working with a range of supporting organisations linked to the water environment, WCWRG is responsible for producing a long-term, strategic plan for managing water resources in the region across public and non-public water supply.

The WCWRG water companies have already engaged with customers and stakeholders – through PR19 and as part of their business-as-usual activities. This project builds on this existing insight to further develop customer and stakeholder evidence to inform and support the development of the regional water resource plan. The overall purpose of this project is to support WCWRG in formulating the best value regional plan for the South West. The aim is to develop the evidence base on customer and stakeholder preferences for the various outcomes associated with the planning objectives. The broad topic areas are:

- **Drought resilience** – preferences for further reductions in risk drought measures (e.g. hosepipe bans) and emergency drought restrictions (e.g. rota cuts/standpipes)
- **Environmental ambition** – support for investment beyond the minimum requirement to reduce the dependency of the water system on sensitive habitats to wider river and groundwater sources
- **Wider societal benefits** – preferences for the broader public value that can be delivered by the plan, including carbon savings, health and wellbeing, and amenity and recreation benefits for communities
- **Risk** – attitudes to the level of risk and resilience to future uncertainties and pressures from population growth, consumption levels, weather patterns and climate
- **Timing** – views on the balance of early investment to reduce risk versus future investment to maintain

customer bill levels in the short term
- **Trade-offs** – views on the constraints on the plan in terms of the acceptable/unacceptable trade-offs between risk, service levels, dependency on the environment, and bills
- **Option types –** preferences for individual supply and demand options and the overall balance between them within the plan
- **Inter-company transfers** – views on sharing water with neighbouring companies or further afield, as a "suppliers" or "recipients"

A combination of evidence review, qualitative research and quantitative research methods has been used to develop the evidence. This report summarises the findings from qualitative research carried out with customers in Summer 2021. An accompanying report summarises the approach, method, analysis, and findings from quantitative research conducted with customers[1].

1.2 Research aims

The purpose of the qualitative research with customers was to provide insight on the broad policy and strategic issues that frame the regional plan and the planning objectives, such as the approach to drought resilience, the balance of supply and demand measures, the level of environmental ambition, principles for sharing water, and affordability issues (e.g. vulnerable customers and future customers). "Light-touch" engagement with stakeholders, sharing the findings from this research was also undertaken and is reported in a separate addendum to this report.

The scope of the research (Table 1.1) was developed from the updated Resource Position Statement[2], scoping meetings with the participant water companies and agreed with the WCWRG Steering Group. Overall, the objective was to explore the broad policy and strategic issues that frame the regional plan and the planning objectives with customers and stakeholders.

Table 1.1: Areas of focus for qualitative research

High-level topic	Main areas of focus for understanding customer views
Supply resilience	Focus on: • Customer understanding of future pressures, including demand increases and environmental protection and improvement • Customer support for reducing severe supply risk from 1 in 200 to 1 in 500 years
Best Value Planning	Focus on: • Customers' priorities for the best value plan (based on the four WCWRG value factors) • Understand customers' views on trade-offs between value planning factors and any unacceptable trade-offs • Understand customer support for planning principles such as the level of environmental ambition, and national leakage and per capita consumption targets • Customers' views on the timing of investment, given the balance between supply risk and planning uncertainty

[1] eftec (2022) Customer Research to Inform the Best Value Water Resource Plan for the South West, Quantitative Research Report, West Country Water Resources Group, May 2022.
[2] West Country Water Resources Group (2021). Resource Position Statement Update, March 2021

High-level topic	Main areas of focus for understanding customer views
Supply and Demand Options	Focus on: • Customers' preferences for key supply and demand options, including the trade-off between supply and demand. • Customer willingness to reduce demand and indications of the extent of that reduction
Sharing Water	Focus on customers' willingness to share/transfer water: • Within and outside the region, and with other sectors such as farming • Understand any constraints or barriers to sharing water
Policy issues and constraints	Focus on customers' views on how regional planning should take account of: • Affordability and inter-generational fairness • Inter-area fairness

1.3 Report structure

The remainder of this report is structured as follows:

- **Section 2** outlines the methodological approach for the qualitative research and its implementation, including learnings from the research.
- **Section 3** summarises participants' views on water resources and water supply resilience.
- **Section 4** summarises participants' views on best value planning, including the importance of the environment, regional planning, and the timing of investment
- **Section 5** summarises participants' views on water supply and demand options.
- **Section 6** summarises participants' views on sharing water resources and any constraints associated with sharing supplies, including with other sectors.
- **Section 7** summarises participants' views on policy issues associated with the regional water resource plan, namely affordability, inter-generational fairness, and inter-area fairness.
- **Section 8** presents conclusions of the qualitative research to inform WCWRG planning and any future customer research.

The main report content is supported by Appendix 1 which provides examples of the research materials (topic guides, pre-read, showcards, etc.) presented to customers.

2. Methodology

Summary

- The deliberative research was carried out online using a specialist engagement platform with:
  - eight groups of household customers with each group meeting over two sessions
  - one group of non-household customers meeting over two sessions
- The sessions featured a mix of discussion topics and exercises, including voting. Participants in the customer groups also completed some pre-reading to build their background understanding, and household customers also completed between session 'home-task' exercises.
- Overall participant feedback on the sessions was positive, indicating a high level of engagement in the research and interest in the topic areas.

2.1 Research approach

In designing the deliberative research component of the project, particular emphasis was placed on ensuring it would provide robust insights from customers that can be used with confidence by WCWRG as a whole, as well as each participating company for their own water resource planning needs. The research approach, including detailed research questions, and the research materials (pre-read, topic guides, showcards etc.) were all developed with input from the WCWRG Steering Group and included feedback from the companies' CCW.

Before the first session, each group of participants was given pre-read materials, which included background information on water resource management and explained water use restrictions in order to build a basic understanding. The materials also included links to video content, news stories, and regulator websites.

The topic guides for the sessions were carefully structured to cover the research scope (Section 1.2) and to enable participants to build their understanding of the issues discussed over the two sessions. This was important to enable both preliminary, less 'informed' views to be heard and to enable discussion and sharing of their understanding and reasoning with others in the group. The overall topic guides and deliberative conversation with customers is outlined in Box 2.1, with the opportunity for discussing other relevant topics as they arose.

Between the first and second sessions, participants were provided with further information and asked to complete two home tasks, the results of which were then discussed in the second session. The reference pack included information on key supply and demand options, which customers were asked to score in terms of how supportive they were of each option. To build on their knowledge developed during the first session and to encourage reflection on the discussion issues, participants were also asked to complete a mini water resources planning exercise which stepped them through the key decisions required.

Examples of the research materials – including topic guides and show materials – are provided for reference in Appendix 1.

Box 2.1: Outline of topic guide and deliberative process

Pre-reading material

- Water industry structure
- Water resources overview including the role of WCWRG
- Information on water shortages including examples and reading/video materials

Session One

- General Introduction
- Water resources and water restrictions
  - Understanding supply and demand
  - Discussion of future changes to supply and demand
  - Water restrictions including awareness / experience of restrictions
  - Acceptable levels of risk of water restrictions
- Best Value Planning
  - Awareness of the supply demand balance
  - Best value planning factors
- Environmental drivers
  - Discussion on taking water from the environment
  - Views on environmental protection and improvement
- Partnership
  - Regional planning including any boundaries
  - Sharing water with other water users

Reference pack for the home task

- Key supply and demand options reference pack
- Exercises:
  - support for supply and demand options
  - 'mini' water resources plan

Session Two

- Introduction and recap
- Options - supply and demand, including discussion of the home task
  - Options for increasing supply
  - Options for reducing demand
- Water resources planning – including discussion of the home task
  - Balance of supply resilience and environmental improvements
  - Supply versus demand options
- Regional planning - drivers and constraints on sharing water resources
  - Water transfers and views on supplying and/or receiving water
  - Acceptability of sharing water
- Policy issues and constraints on the plan
  - Demand management – household water usage targets and leakage
  - Customer impacts – affordability, benefitting future generations and regional variations
- Timing of investment
  - Planning uncertainty vs. supply risk

Note: see Appendix 1 for examples of the research materials.

2.2 Implementation

The deliberative group sessions were conducted between June 2021 and July 2021. Due to the ongoing COVID-19 pandemic and restrictions on in-person gatherings, the research was implemented online using the VisionsLive platform (an online qualitative research host). The groups were implemented in the same way as conventional in-person deliberative workshops, with the same approach to recruitment, participant discussions and stimuli. Nine customers were recruited for each group, in case of any late unavailability or technology problems preventing participation. The online groups were conducted with onscreen video so that all the participants could see each other and the moderator(s). This allowed them to engage and interact more fully with each other and helped encourage conversation and discussion. It enabled the moderator(s) to manage the group more effectively by visually monitoring the level of engagement and encouraging those who were quieter to contribute. The VisionsLive platform also allowed WCWRG colleagues and other interested parties to observe the sessions so that they could hear customer views first-hand and provided the opportunity for them to raise areas of interest for the moderators to probe further via the observer chat.

Household customers

Each deliberative group was 3 hours in total, split between the two sessions (approx. 90 minutes each). Two groups per water company were differentiated by socio-economic profile (SEG ABC1 and C2DE) with mixed ages, plus specific groups for older customers and future customers. The older and future customer groups were mixed SEG and made up of three participants from each company.

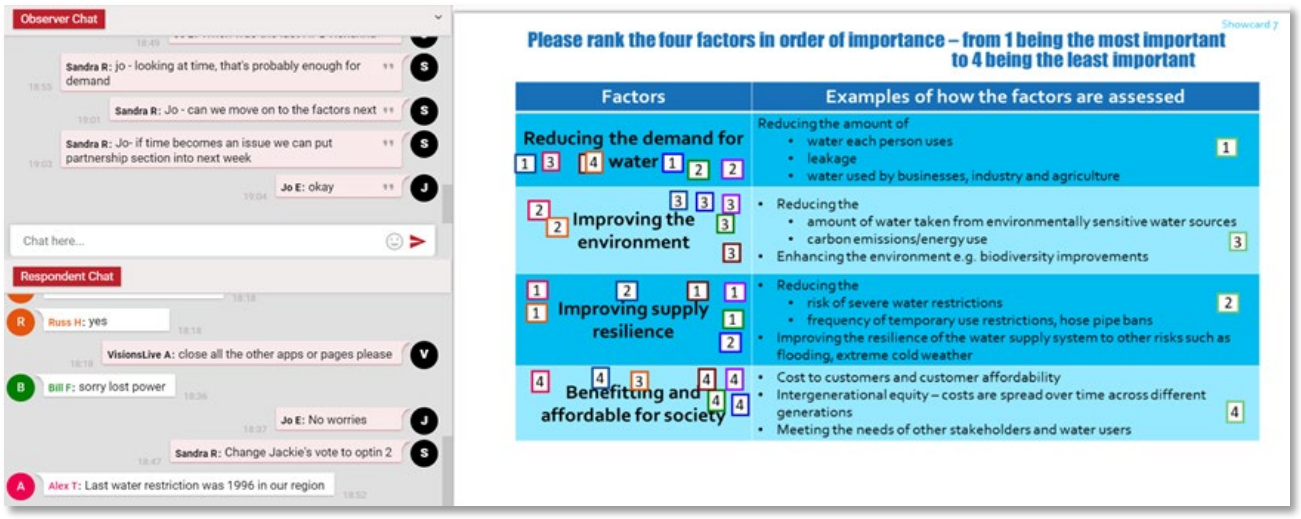
Table 2.1: Deliberative group sessions for household customers

Group	1st session	2nd session
South West Water	21st June (6 - 7.30pm)	28th June (6 - 7.30pm)
Future Customers	21st June (8 – 9.30pm)	28th June (8 – 9.30pm)
Older Customers	23rd June (3 - 4.30pm)	30th June (3 - 4.30pm)
Bristol Water	23rd June (6 – 7.30pm)	30th June (6 - 7.30pm)
Bristol Water	23rd June (8 – 9.30pm)	30th June (3 - 4.30pm)
Wessex Water	24th June (6 - 7.30pm)	31st June (6 - 7.30pm)
Wessex Water	24th June (8 - 9.30pm)	31st June (8 - 9.30pm)
Bournemouth Water	6th July (6 - 7.30pm)	13th July (6 - 7.30pm)

The deliberative sessions were designed to include a mix of discussions and some voting exercises to both aid engagement and capture the strength of feeling of the participants, particularly those who may be quieter in the group environment. The outputs from the voting exercises are included in this report and are good indicators of participant views, in support of the qualitative research.

The overall sample size of 66 participants is reasonable in terms of understanding the degree of consistency in customers' views. That said, the deliberative research was not intended to provide differentiated results by customer segments. In this regard, results should only be interpreted as indicative and not statistically representative. Findings were reviewed to explore any indication of variation in customers' views by SEG, age, company, or between the specific groups of older and future customers. Any variations found are highlighted in the relevant section of this report in order to inform any future research.

Figure 2.1: Screenshot of the Visions Live platform



Given the amount of material covered in the sessions, moderators did not include all votes in all sessions, and, on occasion, a participant was unable to vote for an individual exercise due to temporary connection or technology issues. Sample sizes may therefore vary between polls.

Non-household customers

One non-household customer group was included in the research. Eight non-household customers attended the session (three participants were recruited from each company area), selected to provide a cross section of key non-household customers, including hospitality and service industry, tourism, developers, agriculture, and public services (e.g. school). The participants were from companies ranging from one employee to 150 employees.

The non-household group followed the same deliberative process as for household customers with two sessions, each of 90 minutes (20th and 22nd July). Participants were provided with the pre-reading and reference pack for information but were not asked to complete any of the home exercises, and minor modifications were made to the topic guides to ensure the content was relevant to non-households.

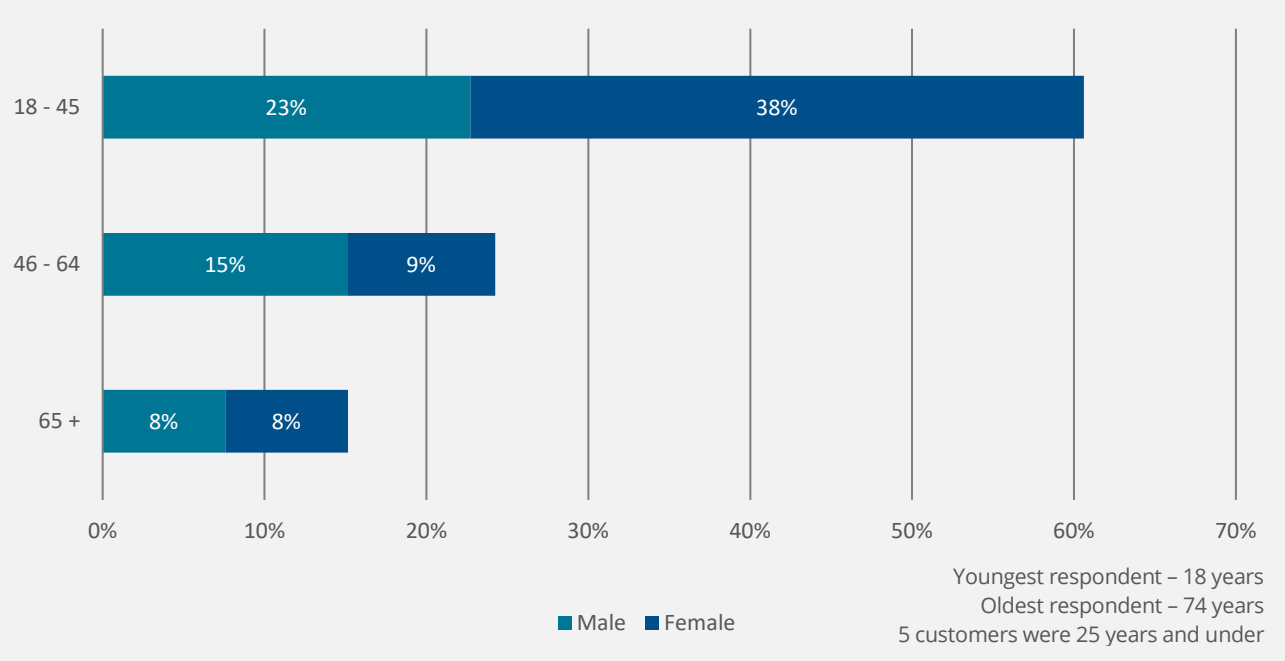
Exercise and voting results

All exercise and voting results presented in this report are for the household customers only. Given the small sample size, findings from non-household customers are not presented separately but have been reviewed against household customer findings. Any differences are highlighted in the relevant section of the report.

2.3 Profile of participants

The 66 household customers are considered appropriate when considering age, gender, socio-economic and ethnicity. 55% of participants were female and 45% male. A broad age range was covered; it should be noted that the largest group aged 18-45 included future customers. 30% of participants were in SEG ABC1, 52% C2DE, and 11% future customers (8% not specified).

Figure 2.2: Age and Gender (n = 66)



2.4 Learnings from the deliberative research process

The ongoing COVID-19 pandemic and its associated restrictions means there are significant constraints on how research can be conducted with customers, particularly for traditional qualitative research methods, and required the use of an online platform. During the research we found that:

- **Use of the on-line video platform**: even where customers were inexperienced with using the technology, after the first voting exercise they typically became comfortable and adept at completing the exercises.
- **Content and coverage**: considerable ground was covered during the sessions, demonstrating that video engagement was effective in terms of allowing a similar level of topic areas and materials to be covered with participants to in-person groups.
- **Representation**: there was a good mix of customers within each group. The on-line system enabled us to engage with customers from across the south west region, which would have been unlikely for in-person groups particularly for the mixed groups for future, older and non-household customers.
- **Engagement**: high levels of engagement were demonstrated by participants throughout the sessions. The voting exercises and visual prompts enlivened the sessions, giving participants the opportunity to interact onscreen, and aid moderators to explore views, particularly with quieter participants. The

respondent chat also offered the opportunity to capture the views of all participants, particularly if the time available to discuss each option was limited.

Participant feedback on the qualitative sessions was very positive. No participants were unsatisfied with the sessions and the majority found the discussions interesting and informative. The majority of participants were also strongly supportive of WCWRG consulting with customers over these issues.

Figure 2.3: Overall satisfaction with deliberative research sessions (n = 40)

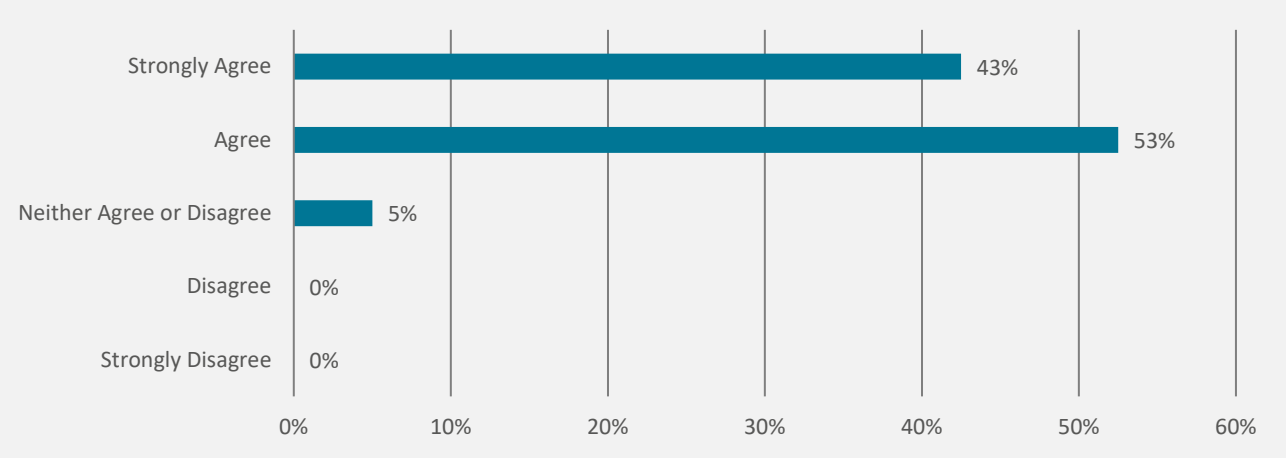


Figure 2.3: Customer views on the discussions (n = 53)

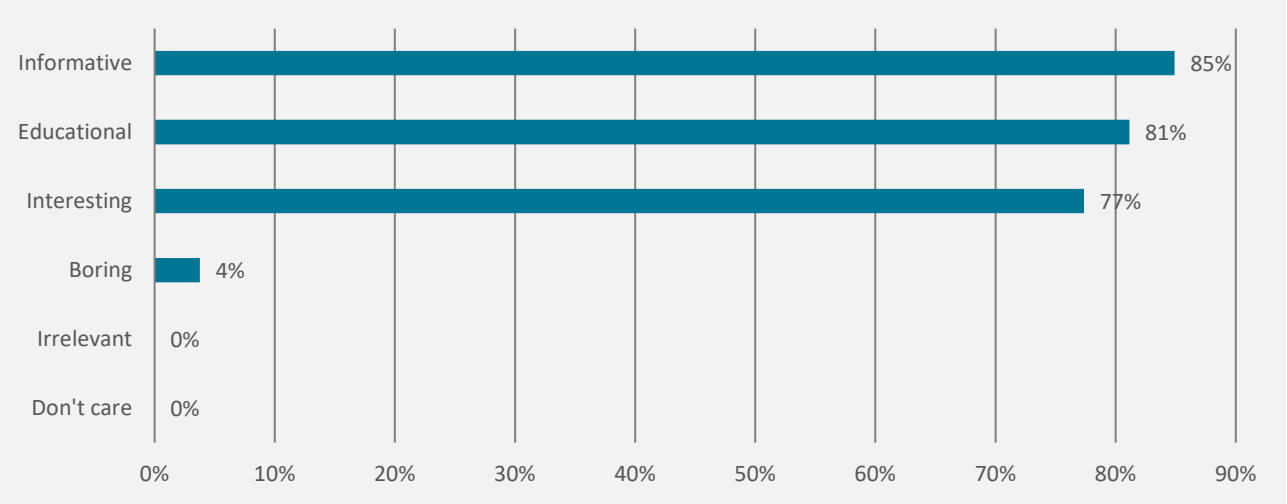
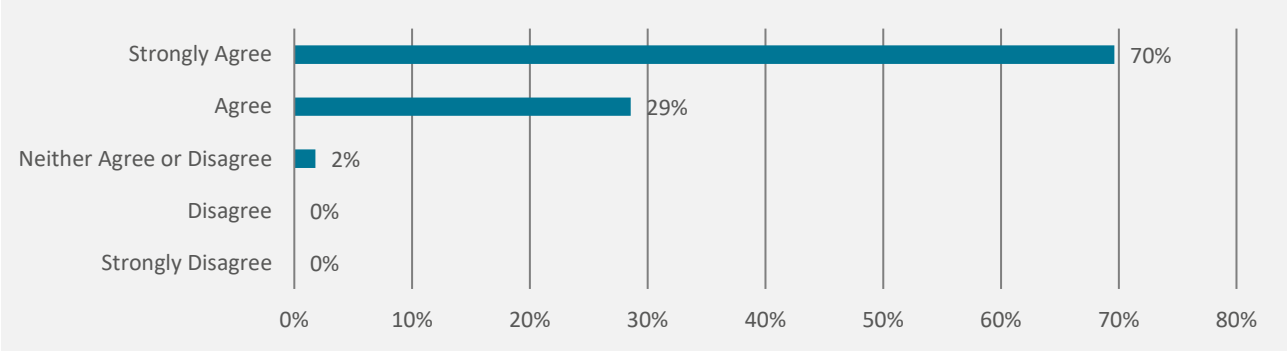


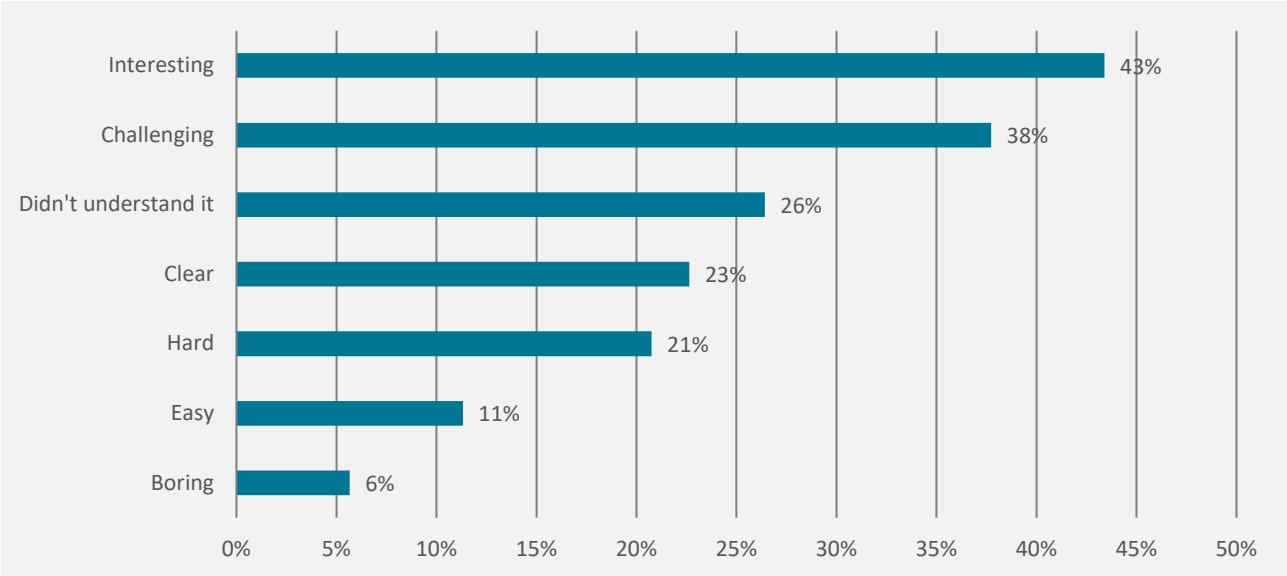
Figure 2.4: How customers feel about being asked their opinions (n = 56)



*Customers could select multiple responses

The pre-reading and home task also built customers' knowledge and understanding of the key issues enabling more informed discussions during the sessions. Whilst participants were able to complete the first exercise scoring supply and demand options, the mini water resource planning exercise raised some challenges, with some customers struggling to understand and complete the exercise. The majority of customers who did complete the exercise provided reasonable responses and so the results are considered to be helpful, providing a useful insight into customer views on supply and demand, and in particular the trade-offs required within water resource planning. However, given the mixed feedback from participants, it is recommended that consideration is given to simplifying any future exercises to be completed at home. The exercise is considered appropriate for customers to complete in a more facilitated environment where the individual stages can be further explained as required.

Figure 2.4: Participant feedback with deliberative research sessions (n = 60)



3. Water resources and water supply resilience

Summary of findings

- Participants recognised that water resources are limited, with the majority considering that they could use less water, although responsibility was frequently placed on others within their households. There was a consensus that participants took water for granted. In contrast over half of non-household participants stated that their business would struggle to use less water.
- Participants were able to identify future pressures on water resources, focussing on challenges from increasing demand with lower awareness of any pressures leading to reductions in supply.
- Customers typically accepted the imposition of less severe restrictions - hosepipe bans and non-essential use bans - provided the situation required it.
- Participants' initial reaction to severe water restrictions – rota cuts and/or standpipes – was surprise that such restrictions could be imposed in the UK. For most participants, severe restrictions would be difficult to cope with and are not generally acceptable, although a significant minority were more confident that they could cope for a period of time. Non-household customers mostly considered that severe water restrictions would have a detrimental impact on their businesses.
- Overall participants supported a reduction in the level of risk of severe restrictions, but there was no clear preference for the extent of risk reduction. Participants were willing to accept an increase in the risk of less severe restrictions and the same level of risk of severe restrictions in order to protect the environment at times of water shortages.

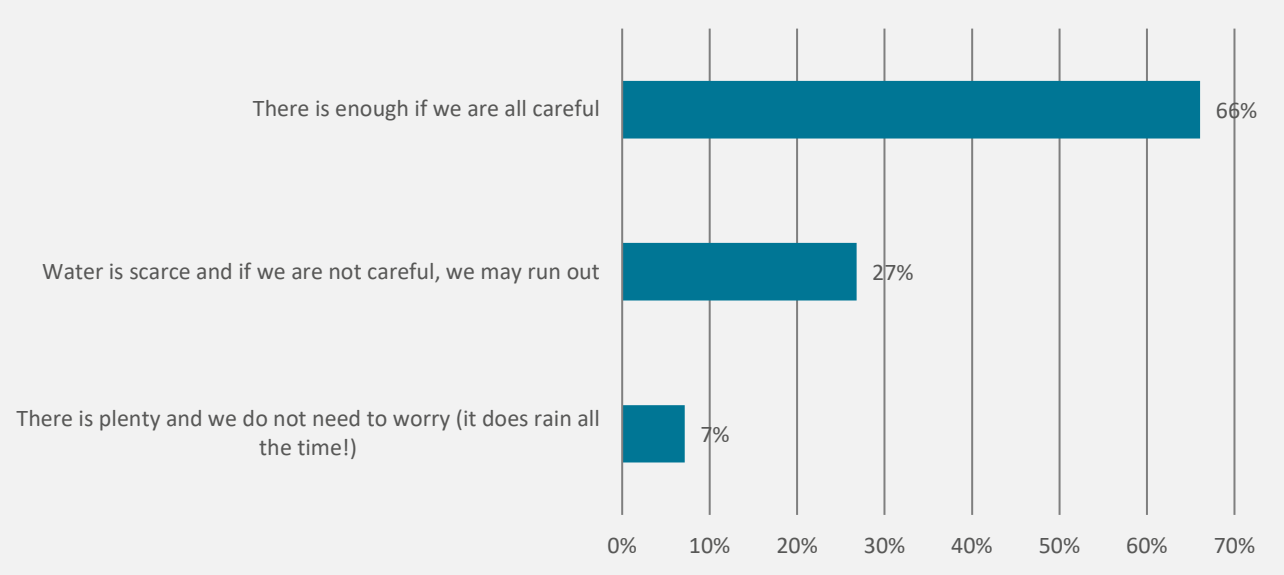
This section summarises the deliberative research findings in relation to water resources, future pressures, and customer expectations for water supply resilience. To help participants appreciate the wider context for water resource planning, the discussion in the first session started with their understanding of the pre-reading material and their perceptions of the current water supply situation and future challenges faced. The session then developed participants' understanding of why supply-demand imbalances may arise and the circumstances in which water use restrictions might be imposed. This facilitated discussion of how participants felt they would be able to cope with severe restrictions such as rota cuts/standpipes and ensured that they were able to give informed views on the acceptable level of risk for these restrictions.

3.1 Customers' attitudes to water

Participants recognised that water resources are limited, with the majority considering that they could use less water and there was a consensus that participants took water for granted.

Participants typically recognised that although water resources are limited, with care they considered that there would be sufficient resources. A significant proportion did consider that the availability of water was becoming scarcer, with the discussions indicating a growing awareness amongst participants.

Figure 3.1: Participants' views on water resources (n = 56)



"I know that water is scarce… but for me as a household I don't really suppose I associate it"

Female, Aged 18-45, SEG C2DE, Bristol Water

"It's only very recently I've sort of taken notice of it, you know climate changes and things like that, and I think a lot of people would assume that we've got plenty of it and it's never ending."

Female, Aged 18-45, SEG ABC1, South West Water

"With the weather and the climate, and the waters drying up quicker – if we're not careful we could run out"

Female, Aged 46+, SEG C2DE, Bristol Water

"If everyone kept filling up paddling pools and going OTT with it, we could [run out], who knows?".

Female, Aged 18-24, SEG ABC1, South West Water

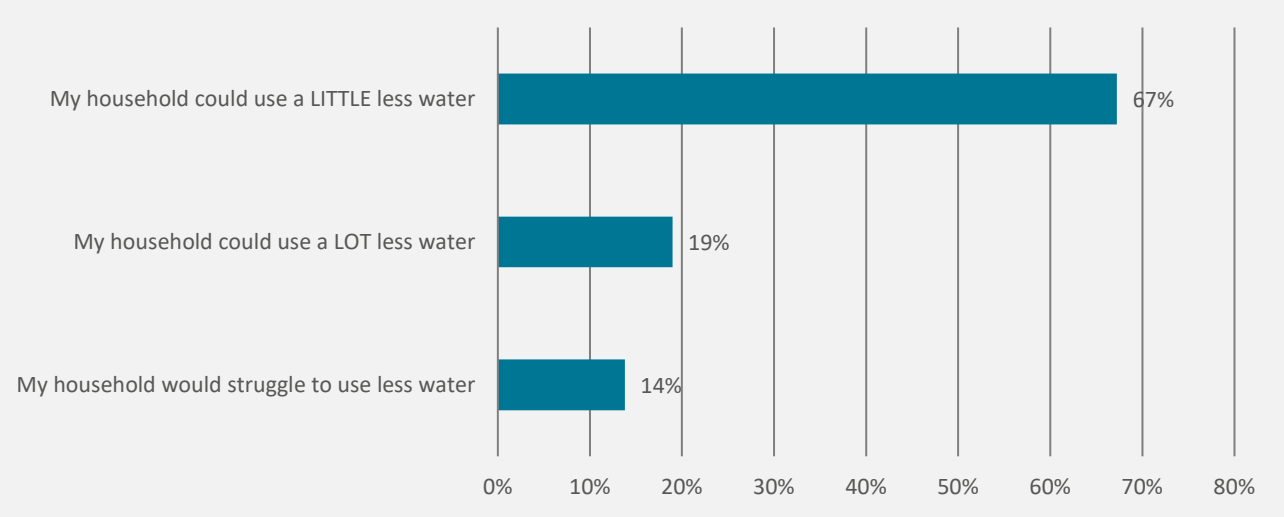
A small, but sometimes vocal minority within the groups, considered that water is plentiful, typically based on perceptions of rainfall and being an island nation.

"In this part of the world where it rains all the time, I kind of struggle to grasp the concept of, there is not enough water."

Female, Aged 46+, SEG C2DE, Bristol Water

The majority of participants recognised that they could use less water, though most felt that they had already taken steps to reduce usage, which limited how much more was realistic. Those participants recognising that they could reduce demand by a lot typically mentioned 'luxury' usage such as paddling pools.

Figure 3.2: Participants' views on water usage (n = 66)



"We're already quite conservative in what we do, we're only a small family: we shower, we boil the kettle, we don't wash cars, we don't water or feed animals."

Male, Aged 46+, SEG ABC1, Wessex Water

"I can't see how we would use much less. A lot of the appliances we've got are pretty efficient, they're relatively modern as well. So, I think I would struggle to see how we would use less"

Male, Aged 46+, SEG ABC1, Bristol Water

"We've got a massive paddling pool that the kids love, so if we didn't have that it would make quite a big difference."

Male, Aged 46+, SEG ABC1, Bristol Water

It was also notable that the length of showers was highlighted most often as a barrier to using less water, and responsibility for high water usage was often placed on others within the household.

"I've personally cut down on my showers, but I've got family members who do take much longer, like maybe more than like 10 minutes"

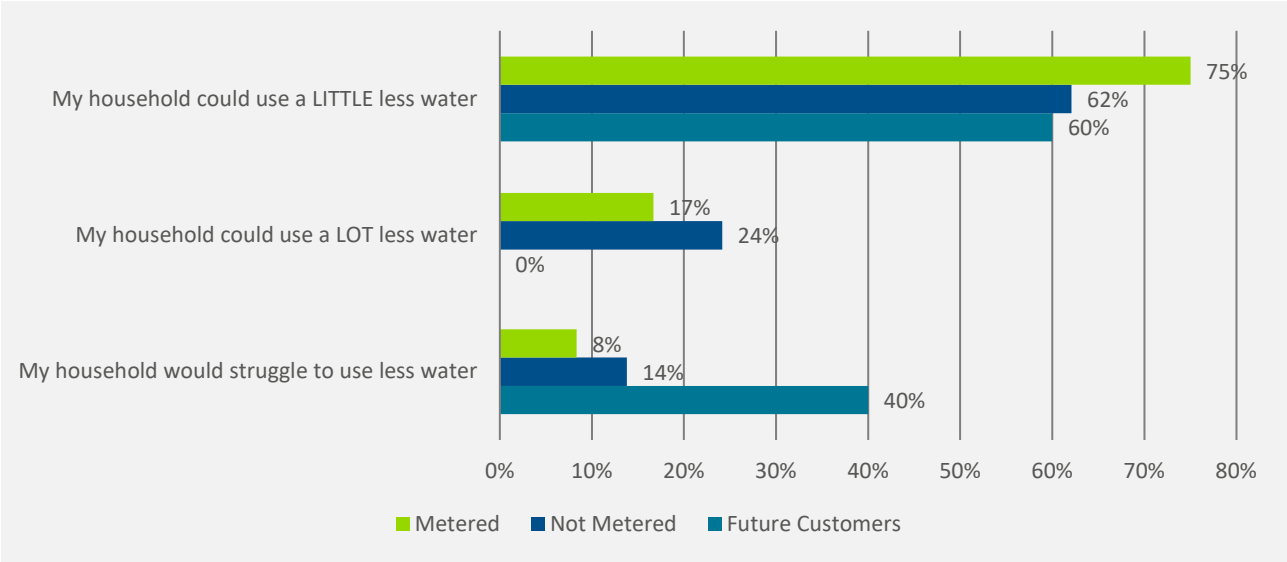
Female, Aged 18-24, SEG N/A, South West Water

"It's the wrong approach to ask me how to use less water, I think we've got to use the technology to use less water"

Male, Aged 65+, SEG ABC1, South West Water

Variations between metered and un-metered customers were also explored and indicated that water meters did not impact on participants' views on the water usage within their household.

Figure 3.3: Impact of water meters on participants' views on water usage



Overall participants in all groups recognised that they take water for granted.

"I've got two little boys and they think that it just comes from nowhere, they just turn the tap on and take for granted that it's going to be there, and I think to a certain extent, I think I used to think that as well."

Female, Aged 18-45, SEG ABC1, South West Water

"You turn your tap on and it's instantly there"

Female, Aged 18-45, SEG ABC1, Bournemouth Water

Non-household customers shared the views of household customers regarding the availability of water. However, over half of non-household participants stated that their business would struggle to use less water, and none considered they could save a lot less water.

"I would struggle to use a lot less water because we're a B&B, so our problem is showers, that people will come home from the beach and shower, they'll get up in the morning and be hot and sweaty and shower."

Non-household customer, Tourism

"I do a lot of spraying, a lot of chemical spraying and that kind of thing, so really in terms of me, volume is sort of fixed."

Non-household customer, Agriculture

3.2 Customers' initial views on water resources and the risk of water restrictions

Participants were positive about the pre-reading exercise and demonstrated an improved understanding of water resource supply and demand issues in preparation for the sessions.

Participants generally found the pre-reading interesting and easy to understand.

"I was a bit surprised how much water you say we use each day per person. It seems like quite a lot"

Male, Aged 18-45, SEG C2DE, Bournemouth Water

"The only think I'd ever heard of was a hosepipe ban, I didn't realise they could regulate your actual water."

Male, Aged 18-45, SEG ABC1, Bristol Water

"It was simplified quite well really about the different levels of extreme drought shall we say. It was quite eye catching on the brochure as well, just kind of brought it all together quite simply if I'm honest."

Female, Aged 18-24, Future Customer, Wessex Water

"The drought was a bit of a shock to me, I wasn't around then, so to see that the 1976 one, I thought that must have a huge impact on the community and obviously with the school that I'm in, one of our key focuses is making sure our community is safe and healthy and I think that could have a massive impact."

Non-household Customer, Public Services

Participants were able to identify future pressures on water resources, focussing on challenges from increasing demand with lower awareness of any pressures leading to reductions in supply.

Participants also used the pre-reading and their past experience to identify why, in some circumstances, demand might outstrip supply in the future. There was good awareness of various pressures, with supply pressures during the summer period highlighted most frequently, in terms of both increasing demand and the impact of dry weather. Groups also discussed the impact of COVID-19 on usage, leakage, and population growth.

"A long hot summer where people have got summer holidays, the weather's hotter, people are at their homes more, using more water for outdoor activities"

Male, Aged 18-45, SEG C2DE, Wessex Water

"I'm assuming covid will have had quite a big difference for – like I would assume a lot of people have gone from not washing their hands necessarily as much as they have to washing their hands like crazy, and probably wanting to be like, extra clean."

Female, Aged 18-45, C2DE, Bristol Water

"Leaks do contribute a lot to use of water because I know of a leak that's been happening in my village for over two years."

Female, Aged 65+, SEG C2DE, Wessex Water

"Wherever you look now, they're building new houses."

Male, Aged 65+, SEG ABC1, Wessex Water

South West Water customers were more likely to highlight the impact of tourism on demand increases, an issue also flagged by non-household customers.

"We're the South West, we get a lot of tourists, holiday makers, down here on a regular basis. People that have got second homes come down here and use the water, therefore if they come down here, we should use some of their water from up north"

Male, Aged 46+, SEG C2DE, South West Water

"During the summer period when we get a lot of holiday makers coming down into Cornwall and Devon, and places like that. So that puts bigger stress on the water supply"

Male, Aged 65+, SEG ABC1, South West Water

"More visitors to the area, [demand] massively goes up"

Non-household customer, Leisure Industry

Participants also developed their understanding of how water companies manage the supply demand balance, including awareness gained through communications from their water company and other sources.

"There's quite a lot of social media along the advertising - encouraging people to share water, be careful with water, so that increases a lot more when the lines are getting closer I guess."

Female, Aged 46+, SEG C2DE, Bournemouth Water

"Going from the pack you gave, when the supply of water starts to decrease then things like the hosepipe ban would possibly come in, and water suppliers would try and tell people to decrease the amount of water to try and make it so there was more available so the demand would be less for it."

Female, Aged 18-24, Future Customer, South West Water

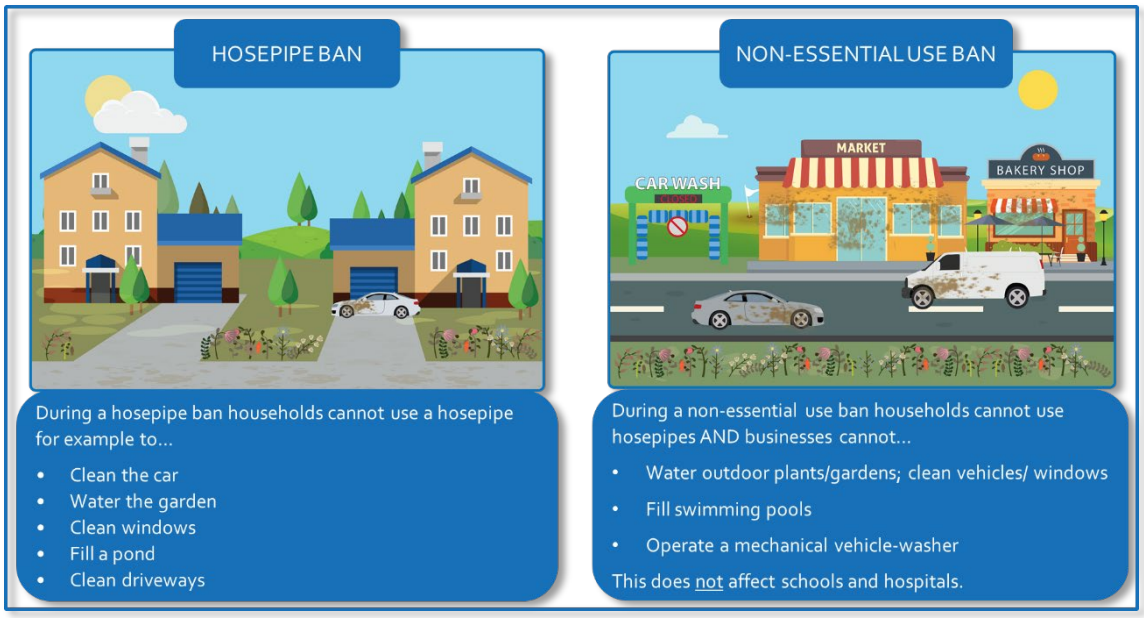
3.3 Acceptability of water use restrictions

Participants were provided with summary information of the different restrictions that may be applied at times of water shortages both in the pre-reading and during the sessions.

Customers typically accepted the imposition of less severe restrictions - hosepipe bans and non-essential use bans - provided the situation required it.

Most participants considered that it would be reasonable to impose hosepipe and non-essential use bans if the water supply situation requires it. Participants highlighted that these uses were not a necessity and recognised the need for everyone to take accountability. Greatest concern about these restrictions was linked to the impact on gardens.

Figure 3.4: Summary information used to explain the less severe water restrictions



"In a needs must situation, I think it's perfectly reasonable."

Male, Aged 65+, SEG ABC1, South West Water

"All the non-essential things are perfectly sensible to cut down on or get rid of."

Female, Aged 18-45, SEG C2DE, Wessex Water

"I'm here for us taking accountability and trying to play our part, the same way we did with covid. And I think, because of covid, everyone's a lot more adaptable."

Female, Aged 18-45, SEG C2DE, Bristol Water

"I think you wouldn't have much of a moan for a hosepipe ban. It's not a necessity to clean your car, water your garden."

Male, Aged 18-45, SEG ABC1, South West Water

"What they need to do is actually explain the why to people. Why is this happening, why are you putting this restriction in place. Being very clear either visually or verbally, the reason we have to put this in place is this is the situation, and if we don't change it, this could happen."

Female, Aged 18-45, SEG C2DE, Bristol Water

On occasion there was a misperception that hosepipe bans are imposed frequently. When corrected, most participants in the group expressed surprise that it had been such a long time since the last hosepipe ban in the area.

Those participants who were against the imposition of less severe restrictions cited varied reasons such as frustration with other customers not abiding by the requirements and the water companies' performance on leakage.

"You're going to get people that will just carry on regardless anyway because they don't like being told what to do. We're in the same situation with Covid and jabs and everything like that, people don't like being told what to do, there's going to be the odd few that dig their heels in and carry on regardless."

Male, Aged 46+, SEG ABC1, Bristol Water

"I personally don't like it when they try and restrict the water supply. There is a part of me that thinks as well that they also waste a lot of water, in terms of the water companies."

Male, Aged 46+, SEG ABC1, Bristol Water

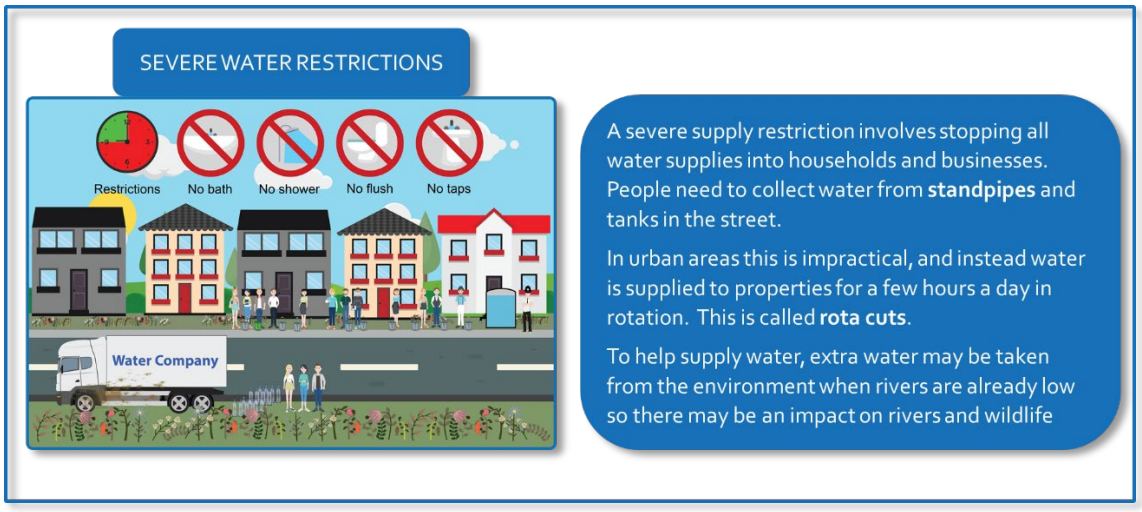
Non-household customers were also accepting of the less severe restrictions, if justified, recognising that they would find workarounds if required.

"It will affect a percentage of our members if we took out the swimming pool and the jacuzzi and the steam room, Covid saw us not able to use the showers, everybody put up with that and they were happy to put up with that, given the circumstances. And they would put up with it again, there's no doubt, but it would have an impact, that's for sure."

Non-household customer, Leisure Industry

Participants' initial reaction to severe water restrictions – rota cuts and/or standpipes – was surprise that such restrictions could be imposed in the UK. For most participants, severe restrictions would be difficult to cope with and are not generally acceptable.

Figure 3.5: Summary information used to explain severe water restrictions



The majority of participants expressed surprise that severe water restrictions were even feasible in the UK, reasons included that the UK is not a low rainfall country, it is wealthy and there is available technology to prevent the situation arising.

"I didn't realise how drastic it could get."

Female, Aged 18-24, SEG C2DE, South West Water

""It shouldn't happen in this day and age."

Female, Aged 46+, SEG C2DE, Bournemouth Water

"Considering it happened back in '76, we've had 40 odd years to learn from that, so why would we be in that situation again? That's just my question on it."

Female, Aged 65+, SEG ABC1, Wessex Water

Unprompted customers typically indicated that severe water restrictions were not acceptable, although there was reluctant recognition that if the measures are required, people would have to cope. Several groups also raised questions about whether customers would still be expected to pay for their water under such circumstances.

"I think it's inconvenient, a hosepipe ban is inconvenient, but I can't imagine not being able to flush my toilet or have a shower."

Female, Aged 18-45, SEG ABC1, South West Water

"I don't think that people would actually be able to cope with it if I'm honest. It's kind of like the lockdown, there was a lot of people who struggled with it and I think this would be another one of them that people would just struggle to be able to handle."

Male, Aged 18-45, SEG ABC1, Bristol Water

"I don't agree with it but if that's the drastic measures that water companies have got to take then fair, you can't really argue it."

Male, Aged 18-24, Future Customer, Wessex Water

"These are extreme [measures], but they're perfectly acceptable if we're in a critical situation."

Female, Aged 18-45, SEG C2DE, Wessex Water

"...the most severe, but is this something that we'd be expected to pay for? Because I mean we pay our rates monthly, quarterly, whatever. And then obviously they are giving us water on rotation and things but we're not able to access the convenience of filling our taps, so, just to ask, would that be something that we would have to pay for?"

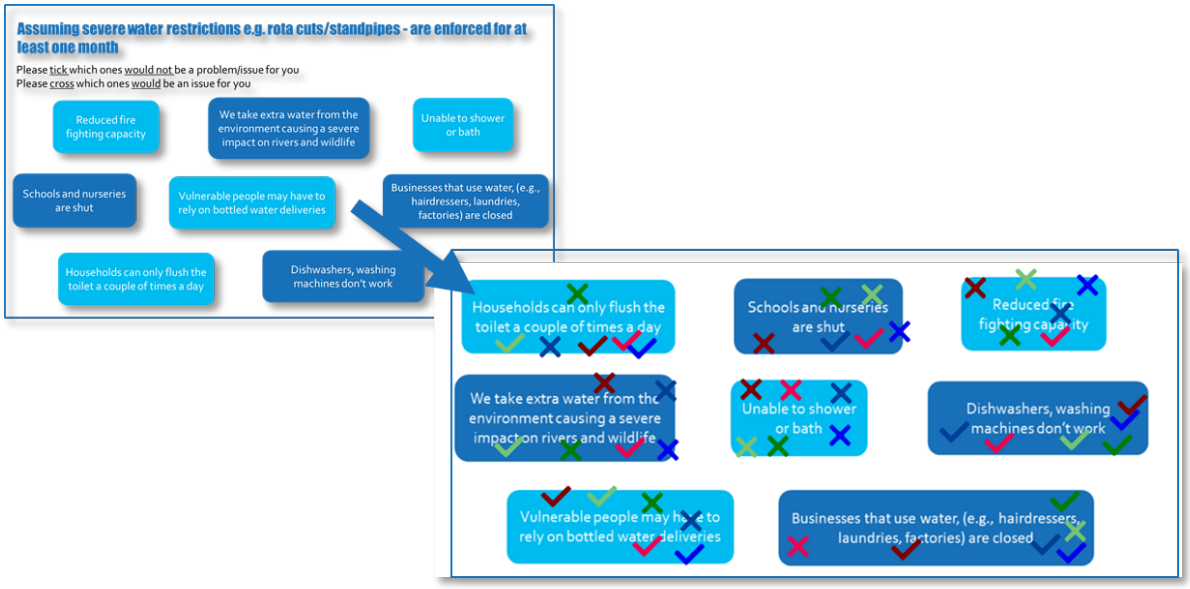
Female, Aged 18-45, SEG C2DE, Bristol Water

"Would we still be paying the same amount of money if you had all those restrictions on you? [moderator confirms yes] ...I'd be pretty annoyed then."

Male, Aged 18-24, Future Customer, Bristol Water

Prior to asking their views on risk levels, participants were asked to complete an exercise identifying which potential impacts they considered to be an issue to ensure that they fully appreciated the potential impacts of severe water restrictions.

Figure 3.6: Exercise to identify the acceptability of potential impacts caused by severe water restrictions



Note: Impacts were presented in different orders between groups to prevent any bias

Participants' overall view was that severe water restrictions would be difficult to cope with, although a significant minority were more confident that they could cope for a period of time.

The most unacceptable potential impacts were reduced firefighting capacity and the environmental impact of taking more water. Non-household customers mostly considered that severe water restrictions would have a detrimental impact on their businesses.

The general feeling was that more severe restrictions (rota cuts or standpipes) would be particularly difficult to cope with. Some aspects such as flushing the toilet just once or twice a day or preventing the use of dishwashers were typically considered to be manageable. Indeed, a significant minority considered that they could cope with severe water restrictions for a period of time, discussions indicating that the recent COVID-19 restrictions gave many participants confidence that they can cope with at least some aspects of prolonged water use restrictions. However, consistent with participants' views on reducing water usage,

restricting showers was considered the most unacceptable personal impact.

Most unacceptable were the potential impacts that did not impact participants' directly – reduced firefighting capacity and environmental impact. Non-household customers also found these potential impacts the most unacceptable.

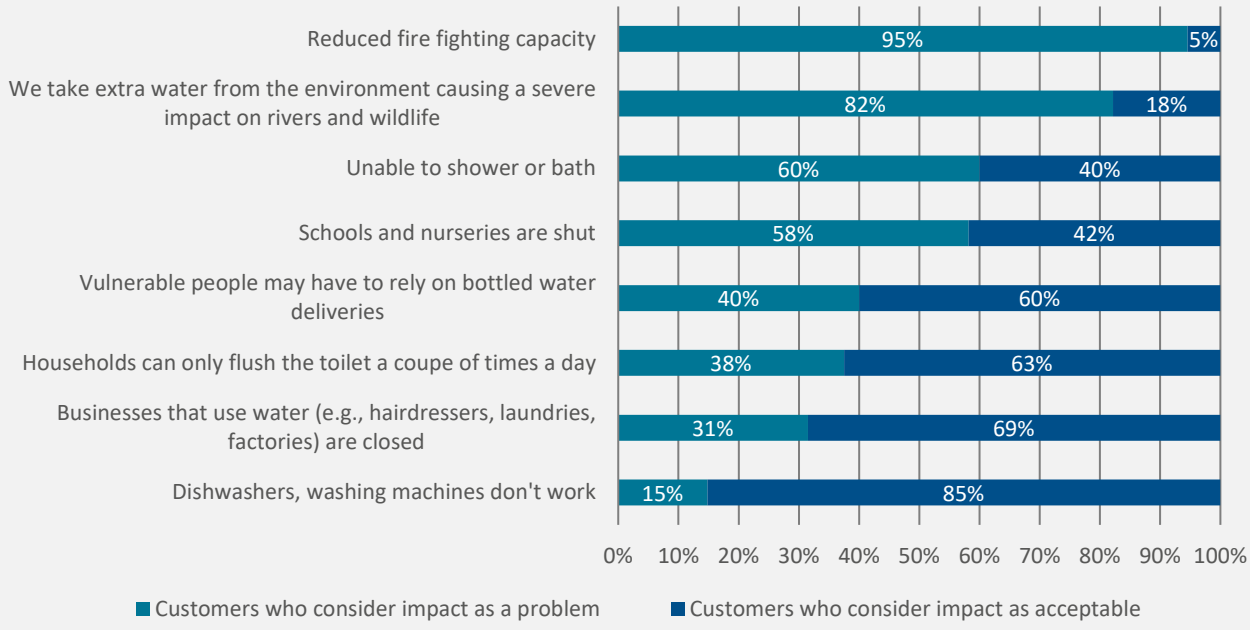
"Well, I wouldn't like to be in that situation at all, obviously, but having lived how I've lived in the past, I know that with a little bit of water, you can make it go a long way. You only need a bit of water in a bowl to wash a whole body. So, you can still maintain cleanliness, etc, as long as you've got drinking water, that's the main thing."

Female, Aged 65+, SEG C2DE, Wessex Water

"I might struggle for a month! Yeah, not being able to shower for a month is excessive – although needs must, I guess."

Male, Aged 65+, SEG C2DE, South West Water

Figure 3.7: Participants' views on the potential impacts of severe water restrictions (n = 54)



There was also some concern amongst household customers about the impact on small businesses, who may have to close during periods of water restrictions.

"Smaller companies are actually going to have to shut if it's the worst-case scenario. The loss to economy, and the people in that area there … it's going to [cost] a lot more than a £10 a year [bill increase] in the future."

Female, Aged 31-45, SEG ABC1, South West Water

Concern was understandably greater amongst non-household customers about the potential impact of severe water restrictions, with a much higher proportion of the non-household customers scoring 'businesses closed' and 'unable to use dishwashers and washing machines' as a problem.

"It would make life extremely difficult. I mean you can't mix mortar without water, oddly enough….. [another participant suggests mixing near a standpipe]….Yeah, just hang on an hour or two whilst I make this ton of mortar… I mean look, unless you could find alternative sources of water, there are ways around some of the issues, but under the severe water restrictions outlined there, I would find it extremely difficult to operate the business, extremely difficult."

Non-household customer, Developer

"I think for us it is kind of like knowing what your customers are willing to put up with, if that makes sense. So Covid's given you a kind of sense of, ok, you've got to leave at 10, because we're licenced and actually are people still going to come in, seeing where that threshold is? So, if for example you were going, there's no toilets onsite anymore, is that a threshold too far, like where do people lie on that?"

Non-household customer, Hospitality

"I don't think that Covid and the water restrictions are in any way comparable. I mean, we survived Covid because we had a mortgage holiday, we had a business rate grant, we were able to defer various costs. I think with the water restrictions, none of those, you know we're not gonna get a payment holiday from the mortgage company, we're not gonna get any grants from government… So you know, it then becomes an entirely different scenario. How are customers gonna take that they come home from Bournemouth beach and can't have a shower and rinse the sand off them, how are they gonna feel, how are they gonna react?"

Non-household customer, Tourism

3.4 Views on the acceptable level of risk for severe water restrictions

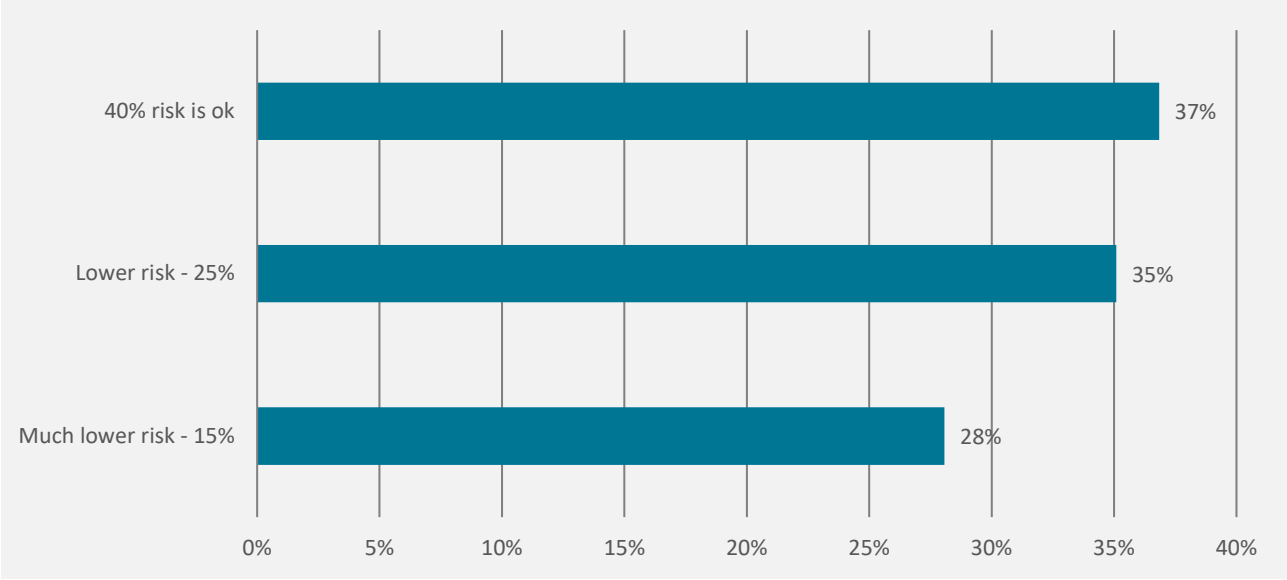
In order to clearly explain risk levels, participants were informed that the current industry standard of 1 in 200 years means that the chance that they experience severe water restrictions once during their lifetime is approximately 40% (assuming an average life of 80 years). Discussions within the group indicated that customers could understand this explanation of the risk level.

Three risk levels were presented to participants – the current level (40%), reduced to the proposed future standard of 1 in 500 years (c. 15%) and a midpoint (25% c. 1 in 320 years)

Overall participants supported a reduction in the level of risk of severe restrictions, but there was no clear preference for the extent of risk reduction.

Whilst there was no clear preference for a level of risk amongst participants, overall, there was support for a reduction from the current level of risk. There was no significant variation in these preferences either by age, SEG or between household and non-household customers.

Figure 3.8: Participants' preferences for the level of risk of severe water restrictions (n = 57)



For those participants accepting the current level of risk (40%), some older customers took their remaining life expectancy and their past experience in terms of the 1976 drought into account when assessing the risk. Other participants did not consider the overall level of risk too substantial, a finding consistent with the significant minority who considered they could cope with severe water restrictions.

"I don't know, it doesn't seem that high to me. 40% over 80 years? If you look at it over 80-90 years if you're going to live that long, 40% doesn't seem that high."

Female, Aged 18-45, SEG C2DE, Wessex Water

"If you've got more chance of getting hit by a car, being in a car accident than being in a water shortage, you know what I mean? I don't feel like it's that big of a deal to be honest."

Female, Aged 18-45, SEG ABC1, Bristol Water

"Well, I think probably It's going to be the higher percentage [40% chance] with everything happening global warming wise and everything at the moment and like the levels of rivers reducing everything so I think it's going to be a higher percentage…as good as it gets"

Female, Aged 18-45, SEG ABC1, Bournemouth Water

'That is really low, 40% the chance of once in your life, I think if it was like, a 90% chance or something then obviously then, but like 40% is under half, I don't think it's that bad, I think obviously it would be better if it was, well if it could get lower, but I think 40% is low in my opinion, that doesn't worry me"

Female, Aged 18-24, Future Customer, Wessex Water

"It's an inconvenience but it's not gonna kill you, if you can't have a shower for a couple of days, or if the risk was a bit higher it's not the end of the world"

Male, Aged 18-45, SEG ABC1, South West Water

Those participants supporting a reduction in risk tended to cite reasons linked to the ability to avoid the situation occuring such as a wealthy country, options to use technology and our climate.

"I think 40% is a reasonable level of risk, but I think we should be aiming for something better, personally."

Male, Aged 65+, SEG C2DE, South West Water

"If we can reduce it, that's better than having a high risk of that sort of thing ever happening in one's lifetime if you see what I mean. If there's a way to reduce it then surely that's better than having some risk."

Male, Aged 18-45, SEG C2DE, Bournemouth Water

"I just think it shouldn't be that bad, in a country that rains all the time, and we're quite a wealthy country. It shouldn't happen."

Female, Aged 46+, SEG ABC1, South West Water

"I think if someone was to say to me, you've got a 40% chance of winning the lottery, I think that's not a bad chance. So, I see it as quite a high chance of we've got potential to see this in the future, and that's not a situation that I want me or my family or friends to be in. So, I find it quite shocking, it worries me to hear that percentage."

Female, Aged 18-45, SEG C2DE, Bristol Water

"The world we live in today, the technology we've got and things like that, we shouldn't have to experience water shortages."

Male, Aged 18-24, Future Customer, Bristol Water

"In this day and age, we've got so much technology that it shouldn't get to that point. It should be stopped, or at least helped, before it gets to that point."

Female, Aged 18-45, SEG C2DE, Wessex Water

The mini-water resource planning exercise included in the hometask supported these findings, with participants selecting a reduction in the risk of severe water restriction when setting the water resource needs. On average participants reduced the level of risk by 80% rather than to the full amount (which equated to reducing the risk to 1 in 500), again indicating that whilst participants support a reduction in risk, there is no clear preference regarding the extent of that reduction.

Participants were willing to accept an increase in the risk of less severe restrictions and the same level of risk of severe restrictions in order to protect the environment at times of water shortages.

Participants were asked to consider high level trade-offs between less severe water restrictions, environmental impact and the severe water restrictions in terms of what they were willing to accept.

Option 1

- more frequent, less severe restrictions like hose pipe bans
- so there is less risk of severe restrictions like rota cuts
- but there may still be a need to take water from the environment at times of water shortages

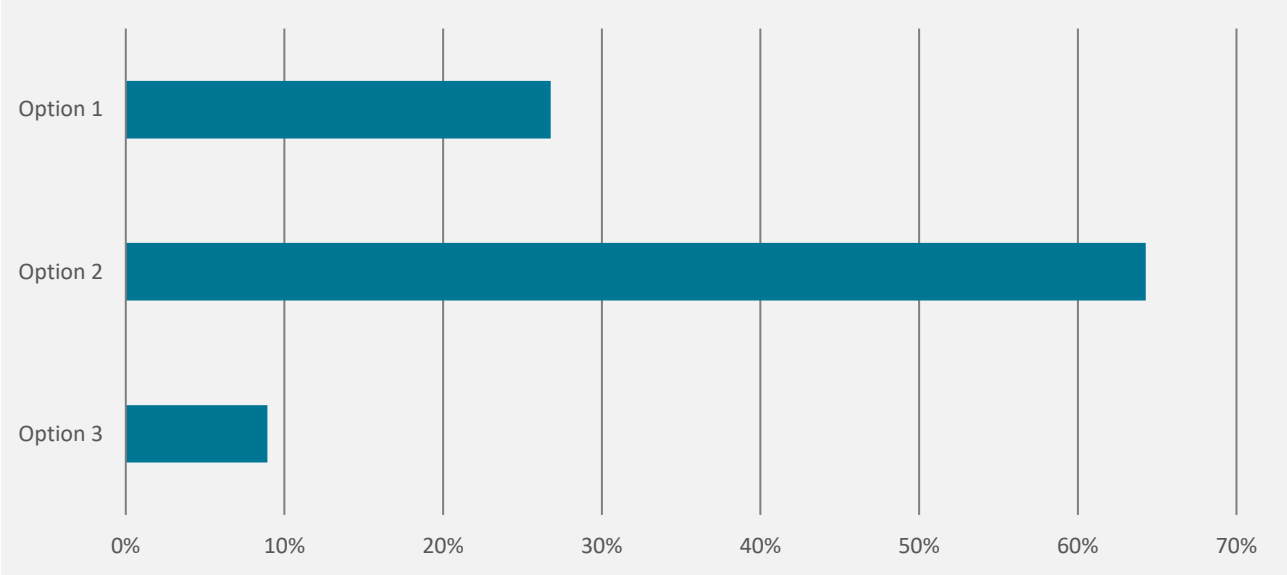
Option 2

- more frequent, less severe restrictions like hose pipe bans
- so that additional water does not need to be taken from the environment at times of water shortages
- but the risk of severe restrictions stays the same

Option 3

- no change to the frequency of less severe restrictions like hosepipe bans
- even if the risk of severe restrictions may increase
- and there may still be a need to take water from the environment at times of water shortages

Figure 3.9: Participants' preferences for the level of risk of severe water restrictions (n = 56)



Participants had a clear preference for the option which protected the environment at times of water shortages, even if it meant accepting more frequent imposition of less severe restrictions such as hose pipe bans, and no reduction in the risk of severe water restrictions.

There was no significant variation in these preferences either by age, SEG or water company, although the future customer and non-household customer groups both showed a more balanced preference between options 1 and 2.

"There's less risk of severe restrictions like rota cuts, that swayed me."

Female, Aged 65+, SEG C2DE, Wessex Water

"The reason I was swayed by option 1 is there is less risk of the severe restrictions, so it's a real selfish thing, but I don't want severe restrictions in place."

Female, Aged 18-45, SEG C2DE, Bristol Water

"It's less impact on the environment which at the end of the day, if there's a hosepipe ban, there's a hosepipe ban. When my lawn goes brown, it's just something you put up with."

Male, Aged 46+, SEG C2DE, Wessex Water

"Yeah I was umming and ahhing between options 1 and 2, and actually I've changed my mind since I ticked it and actually I think I would go for option 2, just to limit the need to take from the environment"

Female, Aged 18-45, SEG ABC1, South West Water

"We should accept that we're not in a land full of infinite resources, that actually in order to stay alive and be able to make the world run, we do have to minimise everything we do, which includes less water, and if it means doing the hosepipe ban and including those, we have to play our part because the climate is changing."

Female, Aged 18-45, SEG C2DE, Bristol Water

"The balanced option, less severe restrictions like hosepipe bans are something we can all manage in our daily lives anyway, but the effect on the environment would actually be the greater risk, so I would choose to go with less environmental damage"

Male, Aged 18-45, SEG ABC1, Bristol Water

"I think option 2 is the lesser of all the evils. Hosepipe ban is not going to kill anyone, taking less water out of the environment is really important, and we all have to take the risk that there might be more severe restrictions at some point, but nobody's saying that in this country you won't have anything to drink."

Female, Aged 18-45, SEG D, Wessex Water

The findings indicate a strong acceptance of more frequent less severe restrictions like hose pipe bans if required to either protect the environment or reduce the risk of more severe restrictions.

4. Best Value planning

Summary of findings

- Customers considered all four best value planning factors to be important and often struggled to decide the relative ranking. They ranked supply resilience as the overall top priority, with benefitting and affordable for society the lowest priority.
- Participants demonstrated strong support for improving and protecting the environment in the context of water resources. The message was consistent across the various ways we asked customers including their broad preferences, trade-offs and through the mini water resource planning exercise.
- Participants supported environmental improvements over maintaining the current level of environmental protection, and preferred environmental improvements to be spread across all catchments rather than concentrating larger improvements on a smaller number of catchments.
- Participants support water companies working together to deliver a wider planning approach, with a preference for national planning over regional planning.
- Participants strongly support investment in regional water resources being progressed in order to reduce the risk of water restrictions, even if there was a risk of incorrect assets being built and associated wasted investment.

Section four summarises the deliberative research findings in relation to WCWRG approach to best value planning for the regional plan. Participants were introduced to the water resource predictions that by 2050 there may not be insufficient water supplies to meet future demand and continue to protect the environment unless action is taken.

4.1 Priorities for the best value planning factors

Participants were presented with the four best value planning factors used by WCWRG in developing their regional plan (Table 4.1) and asked to rank them in order of priority.

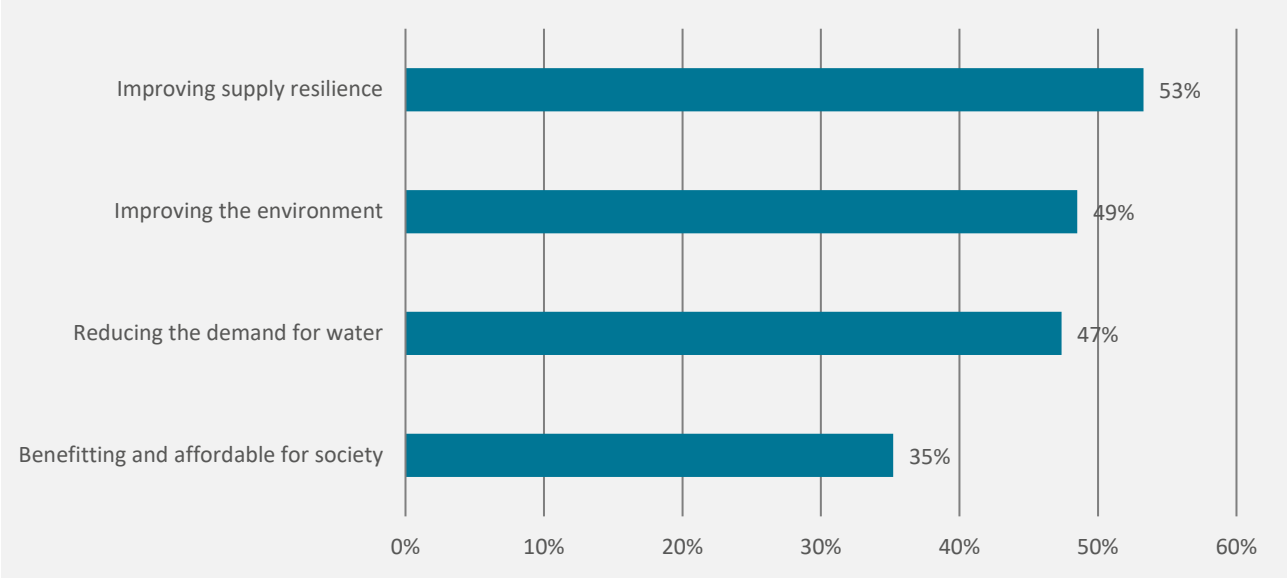
Table 4.1: WCWRG best value planning factors

Factors	Examples of how the factors are assessed
Benefitting and affordable for society	• Cost to customers and customer affordability • Intergenerational equity – costs are spread over time across different generations • Meeting the needs of other stakeholders and water users
Improving the environment	• Reducing the amount of water taken from environmentally sensitive water sources • Reducing carbon emissions/energy use • Enhancing the environment e.g. biodiversity improvements
Improving supply resilience	• Reducing the risk of severe water restrictions • Reducing the frequency of temporary use restrictions, hose pipe bans • Improving the resilience of the water supply system to other risks such as flooding and extreme cold weather
Reducing the demand for water	• Reducing the amount of water each person uses • Reducing leakage • Reducing water used by businesses, industry, and agriculture

Whilst supply resilience was the overall top priority, with benefitting and affordable for society the lowest priority, it was evident when exploring reasons for their rankings that participants considered all factors to be important and often struggled to decide the relative ranking.

Supply resilience was ranked highest priority on average for household customers, with little difference between the next two factors – improving the environment and reducing the demand for water. Benefitting and affordable for society was the lowest average priority. Discussions indicated that participants struggled to decide their relative ranking and considered all factors to be important. Participants also linked factors, for example if demand is reduced it will also improve supply resilience or protect the environment, and so their priorities included an element of personal preference for delivery modes.

Figure 4.1: Participants' priorities for best value planning factors (by average value of importance) (n = 57)



Improving supply resilience

"Human life requires water, so that's got to come out at number one for me. And reducing demand and improving resilience looks after the environment as far as it possibly can."

Male, Aged 65+, SEG C2DE, South West Water

"As we're paying the water company, surely they should be improving the supply before we have to reduce our demand."

Male, Aged 18-45, SEG ABC1, South West Water

"If it costs a little bit more then that's what it costs, that is what it is, isn't it, at the end of the day. If you have to pay a little bit more and reduce the risk of not having enough water, then that's what I would prefer."

Female, Aged 18-45, SEG ABC1, South West Water

"It's restricting someone' s privileges and their right if they want to fill up a water pool or fill up a jacuzzi, I think they should be able to do that, that's why I went for that"

Male, Aged 18-45, SEG ABC1, Bristol Water

Improving the environment

"There'd be no point trying to reduce the demand because if there's no water to begin with because of the way it's affecting the environment."

Female, Aged 18-24, Future customer, Wessex Water

"If we damage the environment and that's non repairable, then we can't go back, but for affordability surely we can subsidise those who can't manage"

Male, Aged 65+, SEG ABC1, Wessex Water

Reducing the demand for water

"I felt like if we were to reduce the demand for water, that would automatically improve the supply resilience."

Female, Aged 18-45, SEG ABC1, Bristol Water

"I think if everybody reduces the amount that they use, that's where it's got to start isn't it, if everybody's educated and everybody uses a little bit less water, then that's a beginning of an improvement."

Female, Aged 18-45, SEG ABC1, South West Water

"If you reduce the demand, it means there's less waste and then obviously leakage goes into waste as well, once you fix that, resilience to ensure that it's improved again, then you can start making changes with a more utopian vision of it, once everything's perfect you can then look at affordability"

Male, Aged 18-45, SEG ABC1, Bristol Water

Benefitting and affordable for society

"In my line of work – I'm a family support worker – I come across a lot of people who are poverty stricken and things, and that's why I put 1 for benefitting and affordability for society"

Female, Aged 65+, SEG C2DE, Wessex Water

"Because it's a service which everybody has to have, and it has to be affordable for everybody."

Male, Aged 46+, SEG ABC1, Wessex Water

"The reason I put benefiting and affordable for society below the demand is because I thought if the cost for water went up because the demand went up, that could lead to an inequality situation; people who can't afford it so much could be in a worse situation."

Female, Aged 18-24, SEG C2DE, Bournemouth Water

The priority rankings did show some variations between customer groups, notably:

- Future customers ranked environment, then affordability as their priorities, with supply resilience their lowest priority
- Older customers prioritised reducing demand
- Non-households ranked supply resilience as their highest priority followed by affordability. Reducing the demand for water was lowest, consistent with their views that further demand reductions are not particularly feasible for their businesses.

Customers were also probed further to understand if there were any factors that would alter their priorities. Participants did not identify any factors or change in priorities unprompted. Given that this qualitative research had not included any cost implications to this stage, participants were specifically questioned whether priorities would change if costs were high. Some recognised that their support for supply resilience or environmental protection may decrease if costs were considered too high, or if it impacted affordability for lower income households. Typically, however, participants confirmed that their priorities for the best value planning factors would remain.

"Can you put a price on your children's future? Of course the cost is going to have an impact if it does start going too high, but, we've got to pave the way for our kids haven't we."

Male, Aged 18-45, SEG C2DE, South West Water

Participants were also probed as to whether their priorities varied over the next 5-10 years compared to a year 2050 horizon. Again, the majority did not consider it impacted their priorities although some recognised that reducing the demand for water may decrease in priority if progress is made.

4.2 Views on the importance of protecting the environment

Participants demonstrated strong support for improving and protecting the environment in the context of water resources. The message was consistent across the various ways we asked customers including their broad preferences, albeit without any cost implications, trade-offs and through the mini water planning exercise.

Protecting the environment was observed to be a driving factor for participants across all groups, with water recognised to be a precious resource for people, wildlife, and habitats. Some participants felt very strongly about the importance of water efficiency for protecting the environment. Others, though, had not really made the link from water use and water services in general to the environment until taking part in the deliberative sessions.

"Wildlife "here before us and here after us" "taking away from something else to feed our own gain."

Male, Aged 18-45, Future Customer, Bristol Water

"I think we wouldn't be here if it wasn't for the environment, if we don't take care of the environment, we're not going to last either."

Female, Aged 65+, SEG C2DE, Wessex Water

This support for protecting the environment was consistent throughout the sessions. When asked about trade-offs between water restrictions and protecting the environment at times of water stress, participants indicated a willingness to accept increased frequency of restrictions such as hose pipe bans in order to protect the environment (Section 3.4). Similarly improving the environment was participants' second priority for the best value planning factors (section 4.1).

This support for protecting the environment was explored further by focussing specifically on the potential environmental impact of water supply. At this stage in the planning process WCWRG have not developed specific environmental protection and improvement scenarios, and so customers were asked about their preferences in principle.

Participants showed strong support for improving the levels of environmental protection. This was similar for non-household customers.

"As humans we kind of get sucked into the city life and forget that there's actually wildlife out there and things that we are destroying."

Male, Aged 18-45, SEG ABC1, Bristol Water

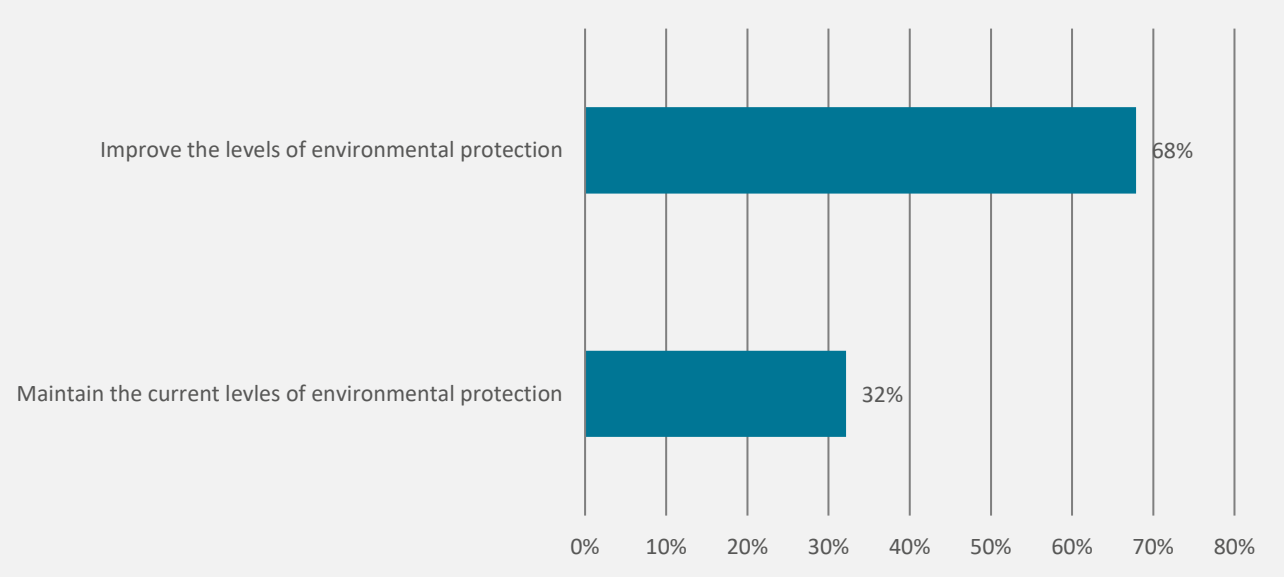
"We should always strive to improve levels of environmental protection"

Female, Aged 18-45, SEG ABC1, Bristol Water

"Companies have a social responsibility to show that they're actually trying to make improvements"

Female, Aged 18-45, SEG C2DE, Bristol Water

Figure 4.2: Participants' support for environmental improvements (n = 63)



It is notable that participants who supported maintaining the current levels of environmental protection were largely from Bristol Water and Wessex Water.

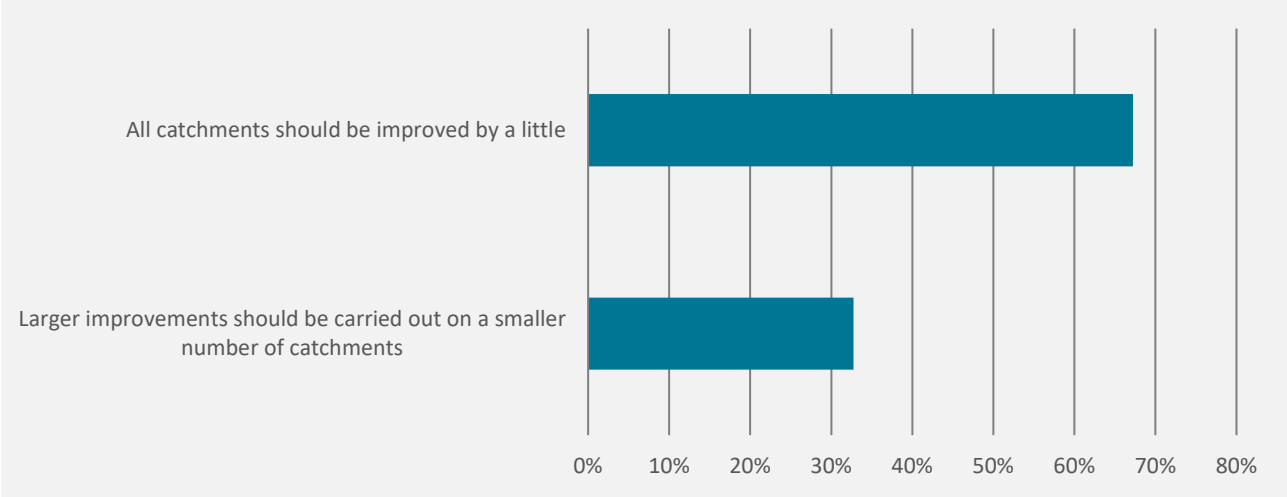
Participants preferred environmental improvements to be spread across all catchments rather than concentrating on a smaller number of catchments.

Participants were asked in principle about whether environmental improvements should be focussed on certain catchments or spread across all catchments.

Overall household customers indicated a preference for delivering smaller improvements across all catchments. In contrast non-household customers preferred larger improvements on a smaller number of catchments.

It is notable that household customers who preferred larger improvements on a smaller number of catchments were again largely from Bristol Water and Wessex Water, or future customers. There may be value in exploring these differences in preferences in future research when more specific environmental scenarios are available, as local knowledge and situations may have influenced their preferences.

Figure 4.3: Participants' preference for delivering environmental improvements



The mini water resource planning exercise confirmed participants' support for environmental improvements

The mini water resource planning exercise, completed as one of the home task exercises between the two sessions, confirmed participants' support for environmental improvements. On average participants selected c.95% of the available environmental improvement in developing their individual plans.

"If there's any way to increase protection of the environment, I don't see why you would turn it down"

Male, Aged 18-24, Future customer, Wessex Water

"I would want to minimise any water that was taken from the environment and used for us, you know it could potentially damage natural habitats and all those sorts of things, so that was my thinking around giving it a high score."

Male, Aged 46+, SEG ABC1, Bristol Water

"It's just because we don't know. At the moment, we don't know enough about what's going to happen in the future, so I think my scoring on that was because I don't know enough about the harm it's doing at the present or how much harm it's doing in the future"

Female, Aged 65+, SEG ABC1, Wessex Water

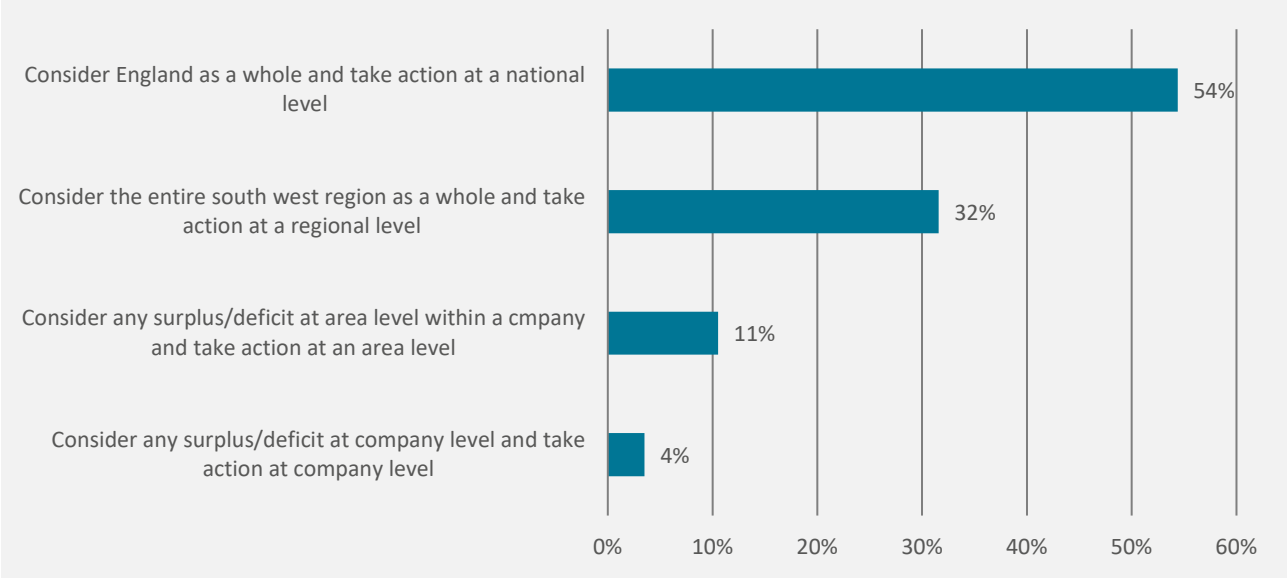
"I had my budget and I deemed W3 [additional environmental improvement]... if you've got W1 [reduced risk of severe restrictions] and W2 [environmental protection] in place, then hopefully W3 will look after itself."

Male, Aged 18-45, SEG C2DE, Wessex Water

4.3 Views on regional planning

The boundaries to water resource planning were explored with customers. It was explained that the three water companies – SWW, Bristol and Wessex – are all working together looking at water resources from a regional perspective to develop a plan that will cover both the public water supply and other water users such as farming and industry. Participants were informed that this may mean that they share more water resources and transfer water between companies and with other users.

Figure 4.4: Participants' preference for delivering environmental improvements (n = 57)



Participants support water companies working together to deliver a wider planning approach, with a preference for national planning over regional planning

Customers recognised that there may be benefits from considering water resources on a regional or national basis.

"We are all in the boat together…will even out the supply."

Male, Aged 18-24, Future Customer, Wessex Water

"If sources can be shared between water companies it has to be a win-win situation."

Male, Aged 46+, SEG C2DE, Wessex Water

"It seems silly for one water company to have more than enough and another to be in a position where they're heading towards the ban and everything, and to not share those resources. We're talking about water, you know, so I think it would be pretty selfish not to support that view."

Female, Aged 18-45, SEG C2DE, Bristol Water

However, support for a more regional approach was caveated, with participants citing it was dependent on no detrimental impact on themselves and also cost implications. Some customers expressed a desire for companies to focus on local solutions where possible.

"Depends on what impact it has on us."

Female, Aged 65+, SEG ABC1, Wessex Water

"As long as not depriving your area, common sense"

Male, Aged 46+, Future customer, Bristol Water

"Transporting water around the country doesn't come cheap. Putting infrastructure in to move it underground doesn't come cheap. I just think one of the questions earlier was how important is it to you and your family, and actually, the cost of it is quite important"

Male, Aged 18-45, SEG C2DE, Bristol Water

"Every business should look at the grass roots first and that would benefit the country overall"

Male, Aged 18-45, SEG C2DE, Bournemouth Water

"It would be really hard to consider England as a whole...local better for the environment [as not transporting water large distances]"

Female, Aged 18-24, Future customer, Wessex Water

4.4 Views on the timing of investment

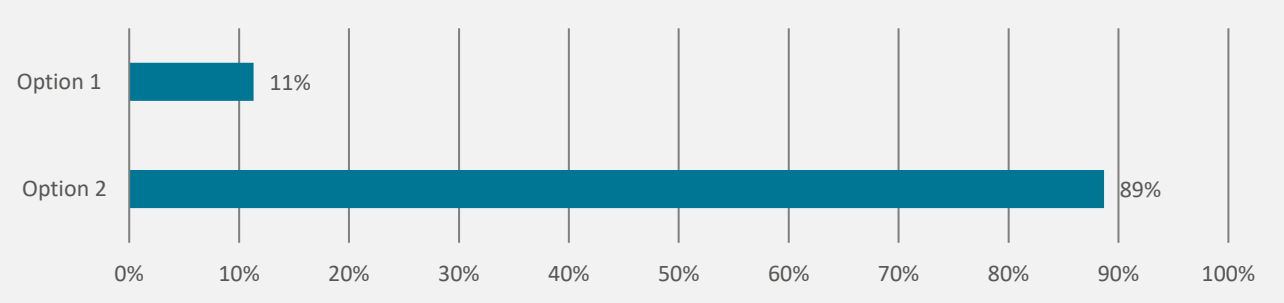
Participants were presented with two options on the timing of future investment, framed within the context that future demand is uncertain and many supply options take a long time to construct.

- Option 1
  - Increased risk of hose pipe bans
  - Same risk of severe restrictions like rota cuts
  - Investment in new supply options can be delayed in order to get more certainty about future needs
- Option 2
  - Same risk of hose pipe bans
  - Less risk of severe restrictions like rota cuts
  - Investment in new supply options goes ahead, even though there is a risk they may not be needed or the wrong size

The trade-off focused on the risk of water restrictions against the potential for constructing the wrong options.

Participants strongly support investment in regional water resources being progressed in order to reduce the risk of water restrictions, even if there was a risk of incorrect assets being built and associated wasted investment.

Figure 4.5: Participants' preference for the timing of investment in a regional plan



Participants strongly supported investment in regional water resources being progressed, even if there was a risk of incorrect assets being built and associated wasted investment. This is aligned with their views on reducing the risk of severe water restrictions. There was no variation in views by SEG, age, water company or between household and non-household customers.

Some customers had clearly been influenced by their recent experiences of the COVID-19 pandemic, which they felt highlighted the need to plan how to respond to events that seem so unlikely they can barely be envisaged. Whilst appreciating that some elements may be unpredictable, many customers considered that a growing population and changing climate are not and so water companies should prepare for these eventualities as water is a necessity to everyday life.

"Preparation is key…got to look at COVID."

Female, Aged 18-45, SEG C2DE, Wessex Water

"I think this virus has probably shown us how quickly things can change in this country, and if we were sat here two years ago, would we have the same answers, probably not. But I think we've now proved that things can change so quickly and who could have predicted that 99% of the population would have their holiday down in the West Country this year, using the water and what have you. It couldn't be predicted, so yeah, we just don't know what's around the corner."

Non-household customer, Agriculture sector

"I think be prepared for the worst rather than getting there and thinking whoops."

Female, Aged 18-45, SEG ABC1, South West Water

"Demand constantly growing, putting measures in place to prepare for this and we have a backup."

Female, Aged 18-24, Future customer, Wessex Water

"Reservoir, implemented now even if demand might not be there. Come 20 years down line, now prepared and no rota cuts. Ahead of the game."

Male, Aged 18-24, Future Customer, Wessex Water

"Investing now will cost less, it will be more expensive in 30 years' time. So, if you have to start investing in 30 years' time, it's going to cost a hell of a lot more. Start doing it now, lower level but continuous, and ultimately will cost us as consumers and businesses less, and cost the water companies less over time."

Non-household customer, Development sector

Even the minority of customers who favoured a more 'wait and see' approach to investment, still tended to expect plans to be prepared so that they were ready to be implemented when required.

"Yeah, I would say prepare sensible with both likelihoods and what the plan and outcome would be, but don't implement until it's required, so be ready to rock and roll, and invest a plan for that, but also don't need to implement until time happens."

Female, Aged 18-45, SEG C2DE, Bristol Water

"I think you need to put a plan in place, I know you might not know what's gonna happen in 10/15 years, but at least start the ball rolling, or otherwise it's too late when the situation arrives."

Non-household customer, Public Sector

5. Supply and demand options

Summary of findings

- No options were considered unacceptable to customers. Support was strongest for reducing leakage, closely followed by reservoirs and using education and awareness campaigns to reduce usage. In general supply options were preferred over demand options. Voluntary metering was the least supported option.
- Participants' preference for supply options was reinforced by a c.60:40 split between supply and demand options in the mini water resource planning exercise. Customers also recognise that there is a need to use multiple approaches for water resource planning, rather than rely on a single approach or solution.
- Reservoirs, pumped winter storage and desalination were the more supported supply options. Participants preferred supply options that were seen to be reliable and produced large amounts of water. Cost was mentioned most often as an influencing factor.
- Reducing leakage and using education and awareness campaigns to encourage reductions in water usage were the most supported demand options. Support for voluntary metering was consistently low, with compulsory and smart metering preferred.
- There is a concern amongst participants as to whether people can be trusted to change behaviours and reduce demand in a sustained way, which strongly influences their views and preferences for demand options. Views on the proposed national target to reduce water use to 110 l/hd/day by 2050 were mixed, linked to these perceptions and how any target would be enforced.
- Whilst participants' strongly support leakage reduction, more specific cost and impact information is required to test the specific target of a 50% reduction in leakage by 2050

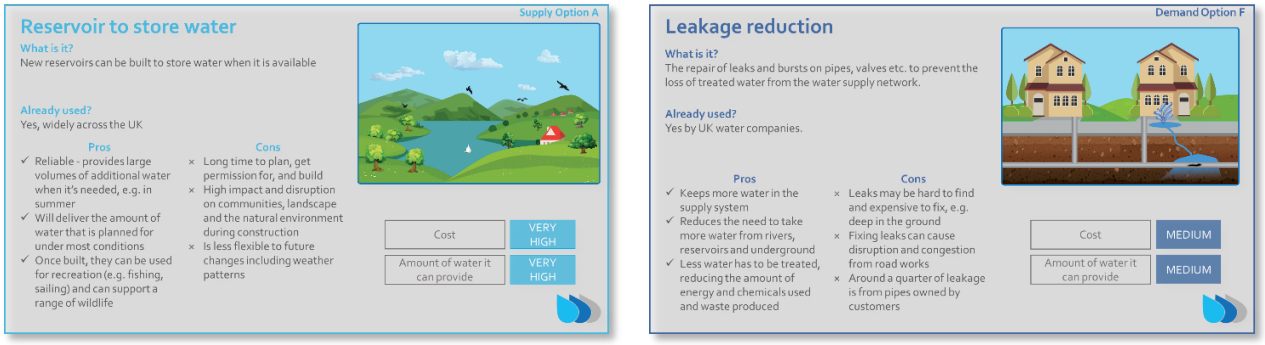
This section summarises findings from the deliberative groups in relation to demand management and supply-side options for water resource planning. The discussion in the groups sought to understand how different options were perceived and reasons behind participants' preferences.

5.1 Methodology

Following the first session, participants were provided with a reference pack which included information on key supply and demand options. Customers were asked to score how supportive they were of each option, which was summarised in terms of:

- Brief description and information regarding whether the option is currently in use
- Graphic illustrating the option, for those participants who prefer information to be presented in a more visual format
- Three key pros and cons for the option
- High level indication of the relative costs and amount of water the option could provide

Figure 5.1: Example of supply and demand option summaries included in reference pack



To build on their knowledge developed during the first session and to encourage reflection on the discussion issues, participants were also asked to complete a mini water resource planning exercise which stepped them through the key decisions required in developing a plan. The exercise asked them to imagine that they had been put in charge of water resources in the West Country Region and by 2050 had to make sure there is sufficient water available to meet the demands of over 5 million people in the region.

The exercise stepped participants through the decision making by asking them to:

- Determine how much additional water is needed in West Country Region by 2050, by deciding:
  - How much water is required to reduce the risk of severe water restrictions (e.g. risk of rota cuts is reduced to 15% in a person's lifetime, equivalent to the 1 in 500 year standard)
  - How much water should be left in rivers and streams to provide different levels of environmental protection
- Select which supply and demand options are the best way to provide the total amount of water needed, including setting the overall balance between supply and demand

The reference pack is included for reference in Appendix A.

Responses were submitted ahead of the second session and the results from the exercise were presented back to each group to facilitate discussions.

The views of household customers were also shared with the non-household customers, who were provided with the reference pack but not asked to complete the exercises. Non-household customer views were consistent with those of household customers.

5.2 Customer support for supply and demand options

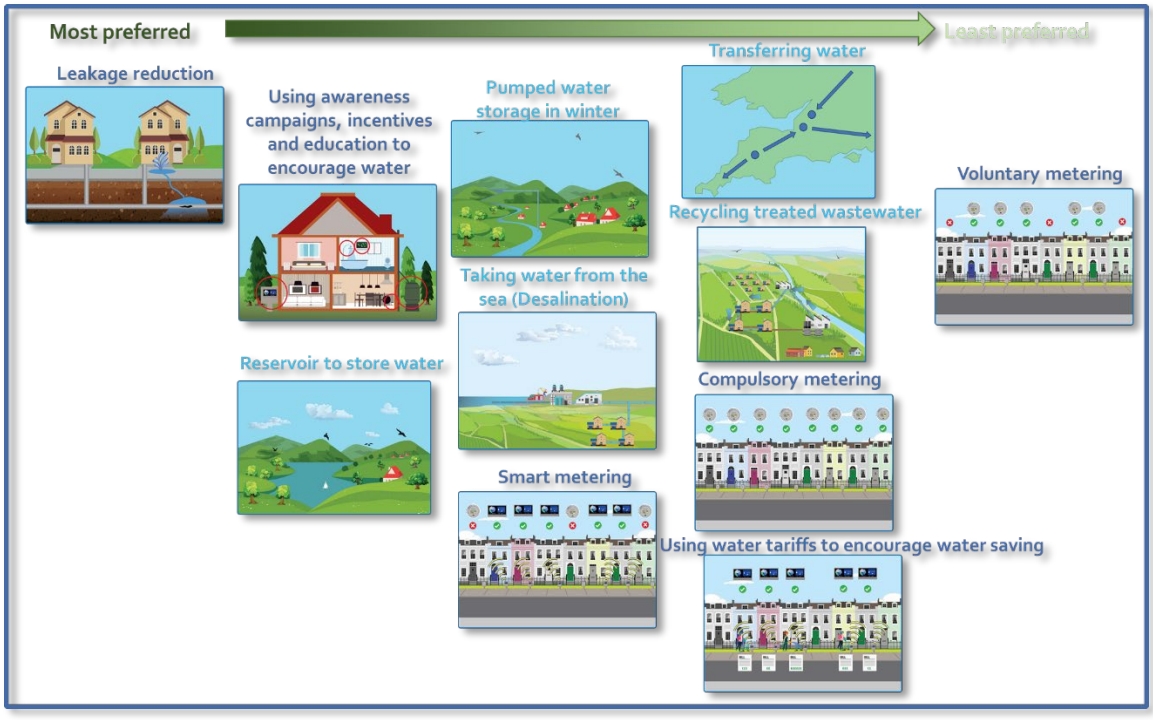
No options were considered to be unacceptable to customers. Support was strongest for reducing leakage, closely followed by reservoirs and using education and awareness campaigns to reduce usage. In general supply options were preferred over demand options. Voluntary metering was the least supported option.

Customers were asked to score each supply and demand option from 1 (not at all supportive), to 10 (very supportive). All options received:

- An average score of five or more indicating that there are no unacceptable options
- Ahe range of scores demonstrating the variability in views

The relative support for the options is illustrated in the figure below, and more detail in Figure 5.3 .

Figure 5.2: Participants' relative support for the supply and demand options



Supply options had average support scores ranging from 8 for reservoirs to 6.5 for recycling wastewater. Overall supply options tend to be preferred over demand options, although leakage reduction (average score 8.5) and education and awareness (average score 8) also gained strong support from participants. Voluntary metering, with an average support score of 5, was the least supported option by a notable margin.

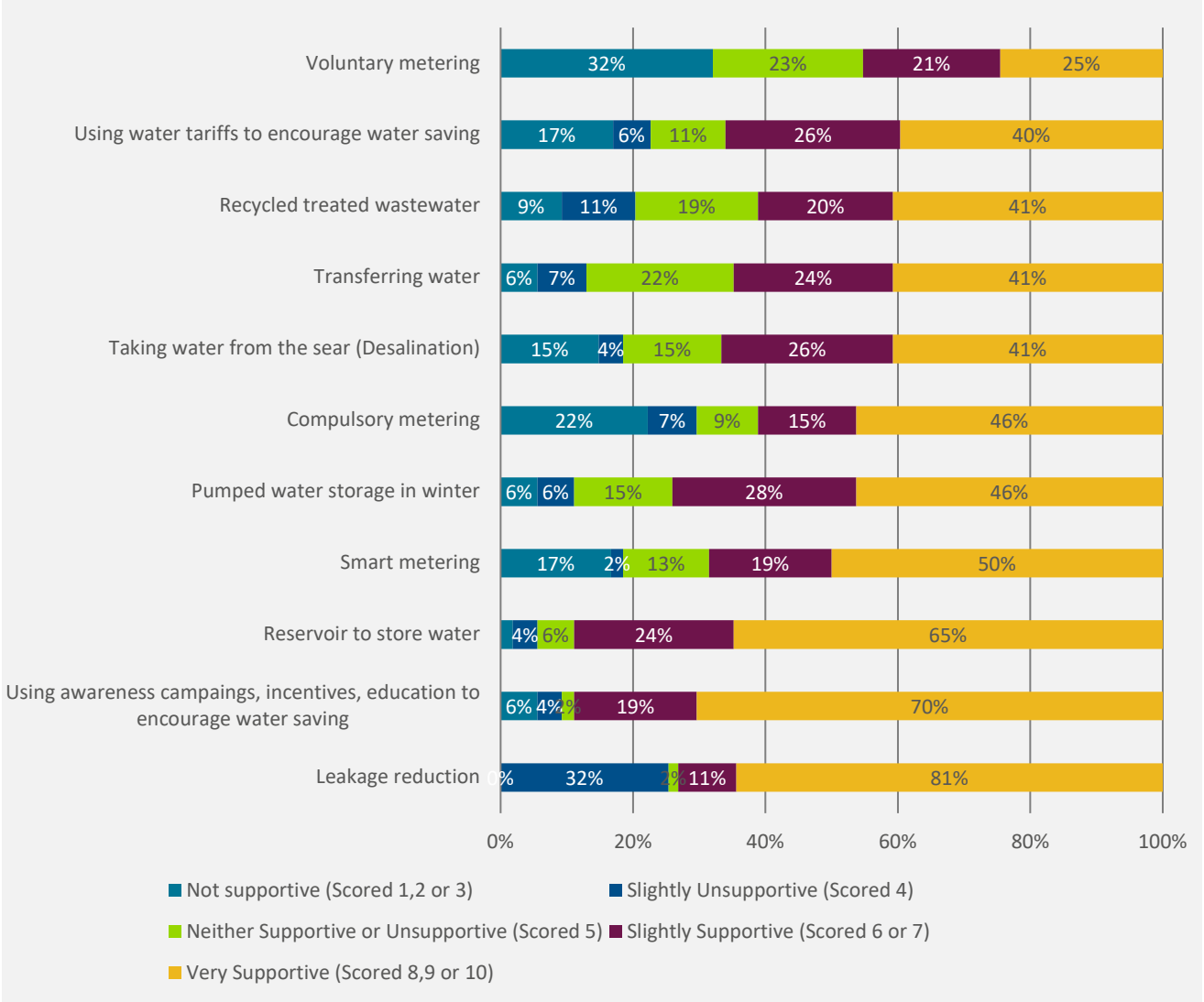
"Supply is where it's at. And I just get the feeling that the other stuff is clutching at straws a little bit. I'm really up for the leakage thing, but even seeing my actual scores, I didn't give anything above a 7, because the demand options it seems a bit like, well, what can we do now?"

Male, Aged 18-45, SEG ABC1 Wessex Water

"I went for the supply because I figured you've got more control over the supply than you have for the demand."

Female, Aged 46+, SEG C2DE, South West Water

Figure 5.3: Support for supply - demand options



5.3 Views on the balance between supply and demand options

Participants' preference for supply options was reinforced by a 60:40 split between supply and demand options in the mini water resource planning exercise.

This preference for supply options over demand was also supported by the mini water resource planning exercise in which participants, on average, met the water balance requirements using supply options for 60%, with demand options generating 40% of the water need. The balance was typically influenced by participants' views that supply options were more reliable, with some hesitancy about demand options that relied on other people changing their behaviours.

"You always need that gap between the demand and the supply. That's kind of your barrier."

Male, Aged 18-24, Future customer, Wessex Water

"If you're just doing metering, in my view it's not necessarily going to make a difference. Whereas if you have new reservoirs, new treated water and things, you are definitely going to get the water."

Female, Aged 18-45, SEG C2DE, Wessex Water

"I put less numbers for the demand because like, the leakage and things like that are making people more water aware I think. You haven't got as much control, but you've got control to make the water and supply the water more than you have people's need for it."

Female, Aged 46+, SEG C2DE, South West Water

"My rationale was that the supply options, it is easier to see the sustainability of it. Whereas with the demand options you don't feel you necessarily see clearly the benefits; so for example, metering versus a reservoir, I just thought that a reservoir you can be more confident than with the metering".

Male, Aged 18-45, SEG C2DE, Bournemouth Water

Those participants preferring a higher reliance on demand typically cited environmental impact as a key factor, and the need for social accountability.

"I've realised, you do kinda need a balance or a mixture of both essentially to achieve what you need to achieve in terms of the water supply, and you kind of need a mixture of both to balance it out."

Female, Aged 46+, SEG C2DE, Bristol Water

"I do think that it should be a balance between the supply and demand, but I don't think we should just look at getting more supply, we need to look at how people are using it, and how we can lessen that and monitor it as well, I think the question is monitoring it, and how to monitor these things, to make sure everyone's playing their part, really, so it's balance, I don't think there's one clear thing to focus on."

Female, Aged 18-45, SEG C2DE, Bristol Water

"Just expecting all this new water to come from somewhere and then the fact that there's at the other side no accountability, it just doesn't sit right, if you look at it there and you actually like, look, it's like, nah, it doesn't sit right, so I think demand options a little bit higher, I wouldn't necessarily say 50/50, but I think 60/40 would be a…more feasible option."

Female, Aged 18-45, SEG C2DE, Bristol Water

"Look at it like this with both supply and demand, I think demand would be much more beneficial for the environment. I wasn't worried about the cost, it's more about the environmental impact"

Male, Aged 18-45, SEG C2DE, Bournemouth Water

"I'd hope that the water authorities have some sort of idea about how much potential there is for saving money or reducing the supply. And as such, they should maximise that as much as they possibly can, before going over to the supply options."

Male, Aged 65+, SEG C2DE, South West Water

Customers also recognise that there is a need to use multiple approaches for water resource planning, rather than rely on a single approach or solution.

Customers also recognised that there is a need to use multiple approaches for water resource planning, rather than rely on a single approach or solution. Over 70% of participants selected three or more different supply options within their mini planning exercise, including options such as transferring water and recycling wastewater that they were less supportive of. Similarly, customers selected the range of demand options within the exercise, typically including both leakage reduction and demand management options, albeit largely not to the full extent allowed, again indicating customers were placing a reality/feasibility assessment on their selection.

"One option isn't going to suffice, no? You need multiple things in order to meet the supply and demand that is needed for it, just doing a reservoir isn't gonna be enough, that was my theory."

Female, Aged 18-45, SEG C2DE, Bristol Water

"...you can turn to plan B and C".

Male, Aged 46+, Future customer, Bristol Water

"I think there's a place for all of them, that was my logic, I guess, for picking multiple."

Male, Aged 46+, SEG ABC1, Bristol Water

"You've got to go for variants, because if you put all your eggs in one basket, and that basket fails, then you're going to be up the gum-tree, whereas at least if you try all the various options, and therefore it's just going to maximise hopefully your supply."

Male, Aged 65+, SEG ABC1, Wessex Water

"I don't think that there's one best way to do it, and I think that different areas of the country might be suited to a different supply method depending on location and depending on the cost."

Female, Aged 18-45, SEG C2DE, Bristol Water

5.4 Supply options

Reservoirs, pumped winter storage and desalination were the more preferred options. Participants preferred supply options that were seen to be reliable, produced large amounts of water. Cost was mentioned most often as an influencing factor.

Reservoirs, pumped winter storage and desalination were the more preferred options. It is notable that additional storage in terms of reservoirs or tanks, plus desalination were identified most often as potential supply options at the start of the first session (prior to participants receiving the information packs). This may indicate that customer preferences are influenced by their previous knowledge and experiences.

When asked to explain their levels of support for supply options, participants preferred supply options that were seen to be reliable and produced large amounts of water. Cost was mentioned most often as an influencing factor. Environmental impact was rarely highlighted without prompting. However, when asked specifically about potential environmental impacts of supply options, participants maintained it had influenced their decision making, though there remains a question regarding whether this was more due to a perception that environment 'should' have featured, given its prominence in the discussions.

Reservoir storage

Reservoirs were considered most appropriate amongst consumers both because of the climate of the UK and because they're seen as good for the environment, including for leisure use.

"Transferring water, it's a good idea if there is water available, but if we all went into a drought there wouldn't be the water available. Whereas if you had a reservoir, that's something - and also the reservoir that could be used for other activities for communities and stuff. They could be used for many different things."

Female, Aged 18-45, SEG C2DE, Wessex Water

"In terms of abundance of water around us, you know, I just think it's the most trustworthy option as well for me, I know that there is a high cost involved, however I still feel like in terms of the amount of water it would supply, of all the options that would be the best one."

Female, Aged 46+, SEG C2DE, Bristol Water

"I just liked the idea of spending loads of money on the infrastructure and improving things rather than trying to educate people in reducing the amount of water that they use."

Male, Aged 46+, SEG C2DE, Wessex Water

"It's in Fordingbridge, there's a water park, quite selfishly, fancy more of those"

Male, Aged 18-45, SEG ABC1, Wessex Water

"In the long run, you're covering every avenue then, aren't you. You're not going to run out."

Male, Aged 46+, SEG C2DE, Wessex Water

Concerns centred around the land required and cost.

"Not an easy thing to build, there's going to be a lot of public outcry no doubt to try to stop them as well, so I think you need a whole gambit of things to try and solve the problems."

Male, Aged 65+, SEG C2DE, South West Water

"Takes up more space. Yes, it might look pretty if it's in a nice area but beyond that, it's more land which could be used for other things"

Male, Aged 18-45, SEG C2DE, Bournemouth Water

Pumped water storage

Pumped water storage did not generate particularly strong views from participants, but overall gained positive responses. However, discussions did indicate that participants were unfamiliar with the concept and so not all understood how the option would operate initially. It is therefore recommended that descriptions are reviewed and developed to ensure better understanding in any future research.

"You're pumping it from a river source, near the outlet of a river into the sea, so you're not really disturbing any of the environmental wildlife in the water."

Male, Aged 65+, SEG ABC1, South West Water

"I'd put it up a little bit more now that's it's been explained, yeh quite well. I think I now know that it would be a bit better for the environment to what I thought it would be, than when I read it. I'd put it a bit higher; I put it as a six but I'd probably put it more like an eight now."

Female, Aged 18-45, SEG C2DE, Bournemouth Water

Desalination

Support for desalination typically centred around being an island surrounded by water and a plentiful supply.

"I went more for the supply option – again, my thinking was the desalination. I know we don't use it as heavily in this country as others but we're an island nation surrounded by water, and I feel like we should be using that more than most."

Male, Aged 18-45, SEG C2DE, South West Water

"You're just taking it straight out of the ocean – yeah it's a little bit more expensive, but you're not really harming the environment, because the sea has hundreds of billions of litres in it, so you're never gonna take too much water out of the sea"

Male, Aged 18-24, Future customer, Bristol Water

"[Desalination] would have been my top choice, but purely because of the price of it I obviously ranked it a bit lower. Because I just think you've got so much like, water from the sea, we've got loads of it, but then because it's such a high cost it's not effective"

Male, Aged 18-24, Future customer, Wessex Water

Those less supportive highlighted cost, energy usage and the potential impact on the marine environment. Disposal of salt was discussed, with participants expecting that alternative uses such as road gritting should be feasible to reduce waste.

"Our seas are suffering enough as it is without us taking more water out of it."

Male, Aged 46+, SEG ABC1, Bristol Water

"So I thought taking water from the sea, I put that as my least preferred just because it's really damaging to the environment and it just uses a lot of energy"

Female, Aged 18-24, SEG C2DE, Wessex Water

Transferring water

Transferring water gained lower support overall than desalination with concerns including the energy involved, environmental damage caused by transfer and apprehension about how water would be used, and potential shortages in the supplying area.

"The cost was less than some of the other options, so that kind of made me look at that one a bit differently. Because it said that it was lower cost, but you could get more water from different areas"

Female, Aged 18-24, Future customer, Wessex Water

"Cost may be lower – but the impact on the environment, like the carbon footprint of having to transfer water from one place to another I think kind of outweighs the price side of it."

Male, Aged 18-24, Future customer, Bristol Water

"Just thought it might be better to have more, because the times we're transferring, probably everybody's going to be in the same sort of boat."

Male, Aged 18-45, SEG ABC1, Wessex Water

"It seems quite crazy to transfer water when you can have a reservoir where it can kind of fill up naturally if that makes sense."

Male, Aged 18-45, SEG C2DE, Bournemouth Water

Recycling wastewater

Whilst using the term recycling appeared to improve support for recycling wastewater, this was the least preferred supply option with three quarters of the groups mentioning the "yuk factor" in some capacity. Greater education may improve support for the option, but even when given reassurances about the safety of any water supplied, reservations remained amongst participants. Concerns regarding the use of chemicals in treatment were also highlighted. Given many participants reluctance however, it is notable that the option was selected by c.70% of participants who completed the mini water resources planning exercise.

"I think because the water is already there and we're just kind of reusing it almost? I just kind of – like with the reservoir stuff, you have to build it again, so yeah, it just made a bit more sense to me.

Female, Aged 18-24, Future customer, South West Water

"You've got sewage plants everywhere, water treatment plants everywhere, so you wouldn't have to pump it as far. So I thought it would be slightly better value for money if you reused the water that was coming through."

Male, Aged 18-45, SEG ABC1, South West Water

"It's already there, rather than waste it, you might as well use it. And it's going to be safe, isn't it."

Female, Aged 18-45, SEG C2DE, Wessex Water

"Most sustainable way to get water considering we're using it and it's the by-product of what we're using, and if we can recycle and treat that, and use that again, it would just be another option which would prevent us from, kind of, the other ones like taking water from the sea and reservoirs where that would have a bigger impact on the environment and using a lot more energy."

Female, Aged 18-24, SEG C2DE, Bournemouth Water

"I thought it was a bit gross. But I thought when I was ranking them all, I was thinking about the environment and things like that, and I did think that possibly recycling is one of the better ways to go."

Female, Aged 18-45, SEG ABC1, South West Water

"I just don't know if I'd trust the water for reasons of either it would possibly contain some kind of waste still because something's been missed, or because it would have lots of chemicals in there, and really I just wouldn't trust it."

Female, Aged 46+, SEG C2DE, Bristol Water

"It's just the thought of it more than anything. Yeh, it just doesn't sit well."

Female, Aged 65+, SEG C2DE, Wessex Water

5.5 Demand options

Reducing leakage and using education and awareness campaigns to encourage reductions in water usage were the most supported demand options. Support for voluntary metering was consistently low, with compulsory and smart metering preferred.

Reducing leakage and using education and awareness campaigns to encourage reductions in water usage were the most supported demand options. Again, these preferences are in line with unprompted responses at the start of the first session, when educating customers to use less water and reducing waste were the most suggested options for reducing demand.

Support for voluntary metering was consistently low, with compulsory and smart metering preferred. Whilst this appears to be a change in attitudes given historical resistance to compulsory metering, it is less surprising in the context of discussions between participants regarding whether people can be trusted to reduce demand consistently, and the underlying message that reducing demand was typically down to others, even within their own households.

Reducing leakage

Leakage was consistently highlighted as a high priority by participants, with many considering it as wasteful.

"The more leaks that are fixed, the less is actually getting wasted, so I was just thinking fix all the leaks and the water builds up itself."

Female, Aged 18-45, SEG ABC1, Bristol Water

"I know it's quite costly, but I think surely in the long run, you're going to save money, aren't you? Save the water, which is the most important thing here, really."

Female, Aged 65+, SEG C2DE, Wessex Water

"I like the whole leakage reduction, I think that's really key."

Female, Aged 46+, SEG C2DE, Bournemouth Water

However, some customers are starting to recognise the challenges in reducing leakage in terms of both feasibility and cost.

"It's not exactly something you can improve on unless you're going to rip everything up and re-lay it."

Male, Aged 18-45, SEG C2DE, South West Water

"Leakage reduction wouldn't actually generate a lot more water, and it's quite costly to do, there would be loads of interruptions and road closures and things."

Female, Aged 65+, SEG C2DE, Wessex Water

The mini water resource planning exercise generated greater debate regarding leakage, emphasising these views, particularly as the exercise encouraged customers to think more about trade-offs and potential costs. Whilst some participants continued to view leakage as wasteful and a 'no brainer' solution, on average participants only selected 70% of the total amount of leakage reduction for both leakage reduction by water companies and from customers pipes, indicating they had tempered their support in light of other considerations.

"In an ideal world the leakage – fixing of the leaks – is a really good thing to do, which is why I scored it highly on the first exercise. But in reality I don't think there's enough hours in the day or enough people in the streets to fix all of the leaks and keep properly on top of it, which is why I didn't give it so many units actually, in the working out in the second exercise."

Female, Aged 46+, SEG C2DE, South West Water

"I did contradict myself looking at the first exercise though, where I put leakage incredibly high, but then I didn't actually put any units in for it [in the second exercise], but I think that was part of the balancing."

Female, Aged 18-45, SEG C2DE, Bournemouth Water

"I know it's bad for the environment for stuff, but why should I be paying out money on their property, when it's not in a sense, it's not for my gain."

Male, Aged 18-45, Future customer, Bristol Water

There was no notable difference in participants' views regarding leakage on customer properties, although some questioned whether the water company should pay.

Using awareness campaigns, education, and incentives to encourage water saving

Participants supported awareness and education as a sustainable long-term option, often mentioning educating children and future generations. The relatively low cost also generated support.

"In a domestic situation, we should all be aware that water is a precious source and therefore we should be reminded."

Male, Aged 46+, SEG C2DE Wessex Water

"That's a must, especially for future generations and things, I think that's really important."

Male, Aged 18-45, SEG C2DE Wessex Water

"In a domestic situation, we should all be aware that water is a precious source and therefore we should be reminded."

Male, Aged 46+, SEG C2DE Wessex Water

"Before we did this session the other week, water wasn't something that I thought about. And I mean, since doing that first session, I'd say that I have thought about it a lot more. Like when I'm cleaning my teeth I've turned off the tap instead of leaving it running, just little things like that I've kind of actually thought about rather than just using it as I used to."

Male, Aged 18-24, Future customer, Wessex Water

"If there is a concerted effort from the big companies of the government, I think it can be really effective."

Male, Aged 18-45, SEG C2DE, Bournemouth Water

Concerns centred around the long-term effectiveness, with some questioning the impact of the deliberative sessions in the long term, and also the regular campaigns by water companies.

"We've all thought about it in the past week, but going forward you forget about it in another week's time, so it doesn't actually solve any problems."

Male, Aged 18-24, Future customer, Bristol Water

"It's not popular for me because I want to use it as much as I want. I don't want people trying to restrict me, you should only stay 30 seconds in the shower and stuff like that. I'm quite happy to pay the bills and let it flow - just keep it coming out of the taps."

Male, Aged 46+, SEG C2DE, Wessex Water

"Seems to me it's like a cop-out, that the water company's not doing its job properly, people are kind of being told they need to do a bit, and really it's the water company not doing its job properly."

Male, Aged 46+, SEG C2DE, Wessex Water

"I think an awareness campaign is just a waste of time. I think people will be like, oh yeah that's nice, then just chuck it in the bin, get on with their lives."

Male, Aged 18-45, SEG ABC1, Wessex Water

Smart metering

Views on smart metering were mixed and typically influenced by participants' experiences of gas and electricity smart meters. Support for smart meters was slightly higher on average for those participants already on a meter compared to those who are currently unmetered.

"You're literally seeing how much you're using each day, so the days you do spend more, people might notice it more."

Female, Aged 18-24, SEG C2DE, South West Water

"I've had my smart meter fitted for my energy, just the fact you can kind of see what you're using, and with the kids it's almost like a game, you know, like, 'can we get less?"

Female, Aged 18-45, SEG C2DE, Bristol Water

"We got a smart meter for our gas and electric, and it makes you feel a little bit like you're in control, because you can see what's being used and where you're going wrong."

Female, Aged 46+, SEG C2DE, Bristol Water

"I've really seen the benefits with electricity, I think it completely changed my mindset with smart metering, so I definitely think it's the way to go."

Male, Aged 18-45, SEG C2DE, Bournemouth Water

"We have a smart meter for the gas and electric and it stresses me out. I'm forever going round the house making sure- and don't get me wrong, it does help people, to motivate them to save, but I would be doing that anyway. But having that flashing in my view, it stresses me."

Female, Aged 65+, SEG ABC1, Wessex Water

"The gas and energy one is just an annoyance. And it doesn't make me think, oh I need to turn this off or turn that off to save money, maybe it will be different with water, but I just don't want another smart meter."

Female, Aged 18-45, SEG C2DE, Wessex Water

Compulsory metering

Participants' support for compulsory metering was also mixed and driven by various reasons including a perception of fairness, and lack of trust in others to use water responsibly. Support for compulsory metering was higher on average for metered participants compared to unmetered. For both metered and unmetered customers support was higher for compulsory over voluntary metering.

"Lot of people are out there that, if they're not using metered water, they will use what they want, when they want, and how they want. I think everyone should have a meter."

Male, Aged 46+, SEG C2DE, South West Water

"And as far as I'm concerned, everyone should be on a compulsory meter, or certainly a smart meter."

Male, Aged 65+, SEG ABC1, Wessex Water

"I feel quite grieved that I'm metered, because everyone I know that isn't metered, namely my parents, seem to use as much water as they want without any care in the world, whereas obviously we have to be really careful because we're on a meter. So, one rule for one, one rule for everyone really, when it comes to metering."

Male, Aged 18-45, SEG C2DE, Bournemouth Water

"It just seems fair, in a way, to make everybody [metered]."

Female, Aged 18-45, SEG C2DE, Bournemouth Water

"Making it compulsory kind of thing, I think it would make people look more into actually how much water they use." – Emily gp2

Female, Aged 18-24, Future customer, Wessex Water

"Water as a commodity is no different to gas or electricity. In fact, it's in very short supply or potentially is, so I think compulsory metering is a sensible option."

Male, Aged 65+, SEG E, South West Water

Discussions against compulsory metering often centred around discrimination and inequality, for example against larger households. Some participants also objected on more of a point of principle that the consumer should have a choice and it was not for companies to instruct them what to do.

"It could lead to discrimination and penalties for households that may have increased water usage for whatever reason."

Female, Aged 18-45, SEG ABC1, Wessex Water

"People that have six, seven family members living in one house, they might have to live in one house because that's all they can afford, they're gonna get hit by a massive water bill where people like myself and my partner gonna [use] very little, and at the moment we pay exactly the same, and that's exactly what it should be, we all pay the same on the street."

Male, Aged 46+, SEG ABC1, Bristol Water

"I still think you should have a choice. Because, today, you should be able to have a choice."

Female, Aged 46+, SEG C2DE, Bristol Water

Using tariffs to encourage water saving

Using tariffs to encourage water saving did not generate particularly strong views from participants, but overall gained some support. However, discussions indicated that participants were unclear how tariffs could be applied and so were unsure of the implications. It is therefore recommended that for any future research, specific options and examples are developed in terms of both which tariff options could be used, and also how they would be applied in practice, linking to metering.

"If the supply of water is restricted, then you've got to use everything to try and stop people wasting water."

Male, Aged 65+, SEG ABC1, Wessex Water

"I think it's just water in terms of it's something we all use and we shouldn't be given off-peak and on-peak tariffs"

Male, Aged 46+, SEG ABC1, Bristol Water

"I think people should be told what the price of a unit of water is or however that works, and they should pay that cost, I don't think you should differentiate."

Male, Aged 46+, SEG ABC1, Bristol Water

Voluntary metering

The main driver for lower support for voluntary metering is connected with the perceived lack of trust that others will consistently reduce their water usage. Both metered and unmetered participants scored the option lowest, their average scores consistent at 5 (out of 10).

"You're gonna get some people that just ain't gonna be bothered."

Male, Aged 18-45, SEG C2DE, South West Water

"I'd rather it be compulsory. Because if it's not voluntary people might not do it."

Female, Aged 65+, Future customer, Bristol Water

"We're at a point now with the entire world, not just the UK, where we need to... it's breaking point for the environment, so, like, businesses such as Bristol Water or whoever need to start really putting their foot down to kind of minimise usage and like, try and be as environmentally friendly as possible, 'cos there is no planet B"

Female, Aged 18-45, SEG C2DE, Bristol Water

"I don't think many people would volunteer to do it, and that's why I put compulsory metering higher."

Female, Aged 65+, SEG C2DE, Wessex Water

"If I'm on a meter, everyone should be."

Male, Aged 18-45, SEG C2DE, Bournemouth Water

This low support is consistent with unprompted discussions between participants in the first sessions, where compulsory metering rather than voluntary was suggested as a means of reducing water usage in most of the groups.

5.6 Overall views on demand reduction

There is a concern amongst participants as to whether people can be trusted to change behaviours and reduce demand in a sustained way, which strongly influences their views and preferences.

Participants overall support for demand options was tempered by their views on the overall effectiveness of demand reduction measures, particularly in terms of whether the reduction in demand is sustainable.

"[Supply] falls on the water company whereas demand options, as was just said, relies heavily on people doing the right thing."

Male, Aged 18-45, SEG D, Bournemouth Water

"It's very difficult to change people's habits."

Male, Aged 46+, SEG ABC1, Wessex Water

The mini water resource planning exercise provides additional evidence of participants' reluctance to rely on demand reduction measures. Within the exercise the impact of different demand options was presented in terms of the steps customers would be required to take in order to meet the maximum amount of water saving (based on the Ofwat 2018 report)[3].

[3] *Artesia Consulting: The long term potential for deep reductions in household water demand, produced for Ofwat, 2018*

Table 5.1: Demand options included in the mini water resources planning exercise

Demand option	Description	Max. no of units in exercise	Avg. customer selection
Demand Option N1: Water efficiency awareness	This means most customers take basic steps to reduce their water usage e.g. don't leave taps running, shorter showers, fit a save-a flush to toilets, more use of water butts	10	90%
Demand Option N2: Demand Option N1 + Metering	This means most customers take the steps in Option N1 plus e.g. limiting showers to 4 mins, limited baths, install water efficient taps, shower heads and save-a-flush, and most customers use water butts or reuse water in the garden	10	65%
Demand Option N3: Demand Option N1 + more water efficient homes and appliances	This means most customers take the steps in option N1 plus e.g. installing water efficient appliances, all old toilets with large cisterns replaced with dual flush, any internal plumbing leaks fixed (e.g. leaking toilets, dripping taps), some properties use recycled water to flush toilets	20	55%

Participants did not select the maximum potential amount of water offered by demand measures, particularly for the options that required more extensive action by customers themselves.

One factor that was raised by some customers, unprompted, was the scale of water bills. In three-quarters of the groups, the relatively low level of water bills, particularly compared to energy, was highlighted as a reason for people not reducing demand.

"I think that in some parts of the country there's plenty of water, but where water is restricted – I hate to say this, but if the water companies put the price up of water, people will start using a lot less."

Male, Aged 65+, SEG ABC1, South West Water

"Well, they could put the price up, that would stop people. We don't want that to happen but it could."

National target for daily water use

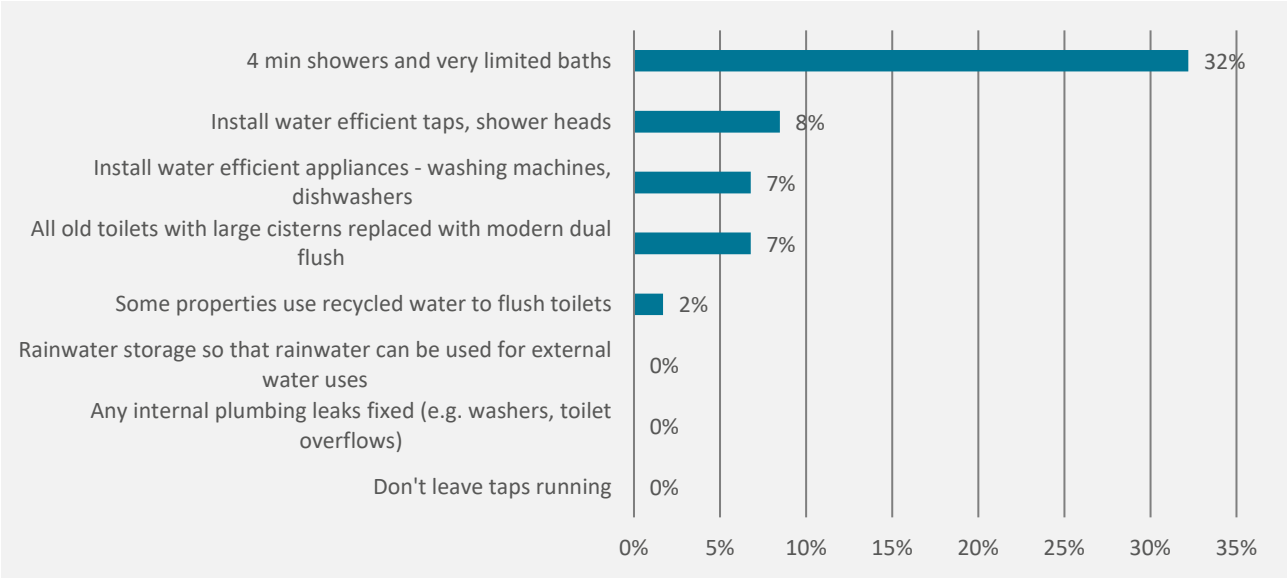
Views on the proposed national target to reduce water use to 110 l/hh/day by 2050 were mixed, linked to participants' perceptions as to whether demand reductions are sustainable and how any target would be enforced.

Participants were also asked about the proposed national policy target of reducing per capita consumption to 110 l/hh/day by 2050. This was framed as everyone in the country having to reduce their daily water usage on average by 20-25% reduction, illustrated by a number of different steps and measures that customers would have to take. Participants were asked to identify which demand reduction measures they hold reservations about or are unwilling to comply with.

Consistent with other feedback four-minute showers were the most unacceptable. Measures considered to be 'easy' and reasonable were accepted (e.g. using water butts, fixing washers). However, measures that potentially had a larger financial impact such as installation of appliances, replacement of toilet cisterns generated more discussion, typically concerning who would pay and the impact on lower income customers.

Underlying the discussions remained concerns about whether all customers would change their behaviours and how any such target could be enforced. Overall, views on the acceptability of having such a target were mixed.

Figure 5.4: Participants' relative support for the supply and demand options (n = 59)



National target to halve leakage by 50%

Whilst participants' strongly support leakage reduction, more specific cost and impact information is required to test the specific target.

Participants strongly supported leakage reduction, but some did question what was realistic in terms of disruption, a baseline level of leakage and cost. At this stage in the planning cycle, it was not possible to probe support for the specific 50% target without more detailed information regarding costs and impact such as disruption. The application of a set target may be an area for further consultation with customers once more information is available, particularly around baseline levels and differences between areas.

6. Sharing water resources and any constraints

Summary of findings

- In principle, participants were supportive of sharing resources, but expected recipients to be responsible and meeting similar standards. Customers also caveated support that the transfer should not impose any financial burden on supplier companies ("recipient pays").
- When asked about specific constraints on sharing water, participants strongly supported sharing to protect the environment. They expected that recipient areas should use water responsibly and meet similar standards. Support was lower if it could affect water quality in terms of taste or hardness, particularly amongst non-household customers.
- Support for sharing water resources with sectors other than the public water supply was more nuanced, and dependent on how essential the sector is perceived to be, with agriculture or power acceptable but more mixed responses to industry and other users.

This section summarises findings from the deliberative groups in relation to sharing resources and water transfers, and the associated policy issues and constraints on regional water resource planning. Participants were not informed of the likely role of their company (as 'supplier' or 'recipient' of water). To facilitate participants taking a medium-to-long-term perspective, it was made clear that the status may change between supplier and recipient companies in the future as circumstances change.

6.1 Views on sharing water resources

In principle, participants were supportive of sharing resources, but expected recipients to be responsible and meeting similar standards. Customers also caveated support that the transfer should not impose any financial burden on supplier companies ("recipient pays")

Consistent with participants' views regarding regional planning (Section 4.3), the majority of customers considered water to be a shared resource and so supported the principle of sharing and transferring water between regions and nationally. Participants did not consider that each individual company should be self-sufficient, particularly given some companies already share resources.

"It's better all round for everybody really if someone's got more water and we can use that and they can transfer it to us, then why not?"

Female, Aged 18–45, SEG ABC1, Bristol Water

"If there's more water in one area than another, to share it around makes a lot more sense than go through the making [of] good water."

Male, Aged 18-45, SEG C2DE, Bournemouth Water

"I don't have a problem with it personally myself, because if we were in that situation and we needed the water because of a drought and that, and other companies were willing to provide it to us as we'd have done to them, I'd be quite happy."

Male, Aged 18-24, SEG Future customer, Wessex Water

"It just makes common sense. We've got areas of high urban density, which possibly don't have the means or ways of storing water, and we've got big rural areas which have. So it makes sense to move one to the other."

Male, Aged 46+, SEG ABC1, Wessex Water

Some participants questioned whether the infrastructure was already in place, their support for sharing water more limited if it required new infrastructure.

"Depends on whether you've got the infrastructure there to enable you to do it, because I imagine that's probably quite costly as well, to get that infrastructure in place."

Male, Aged 46+, SEG ABC1, Bristol Water

"The pipes that are already in place, aren't they, from different places, so that seemed like a great idea."

Female, Aged 18-45, SEG C2DE, Wessex Water

However, nobody suggested sharing water should be unconditional even if there was a large surplus of water. Some participants would want to understand the reason for the transfer and the cause of the supply deficit. The majority expected recipients of water to be responsible and meeting similar standards. Fixing leaks and transfer for essential use only, were mentioned most often as examples of behaving responsibly. Customers also caveated their support in that the transfer should not impose any financial burden on supplier companies ("recipient pays") and it should not cause a supply deficit in their area as a result.

"Transferring water should only be done at a last resort. i.e. that people in another area, their supply is about to be interrupted – if that's the case, then yeh, transfer it, and if that's the case I may accept a degree of change in the taste and hardness etc, so all the questions that followed that I would put up, but only if it was being transferred to prevent having their supply interrupted."

Male, Aged 65+, SEG E, South West Water

"I'm all for the transferring of water, I do like the idea but I think it has a lot of conditions, and is dependant on a lot of things, um, and we would probably want to know the reasons as to why before I would agree fully."

Female, Aged 46+, SEG C2DE, Bristol Water

"If you're sending it to somewhere that's got a leak, for example, I would disagree with that completely. But I was going by the basis that maybe we had more water than them, and they were in more of a desperate need than what we were, and they didn't have a leak."

Male, Aged 46+, SEG D, Wessex Water

"Provided that wherever we were transferring it to were responsible with it, I don't see a problem with it. It wouldn't be any good us being on standpipes while somebody else is filling their swimming pool."

Male, Aged 46+, SEG C2DE, Wessex Water

"I haven't got a major problem with transferring water, but what I do have a problem with is down here in the South West we pay more for water than anywhere else in the country, so would we charge them our rates? Or would they pay for it what they pay? Because it that was the case we would lose a lot of money."

Male, Aged 46+, SEG C2DE, South West Water

"I think it depends on if, let's say someone in Bristol was transferring water up north, does that impact the water availability here in Bristol? If we've got spare, that's fine, but if we're then taking it away then someone else is going to struggle, then I don't agree with transferring water. But if there's a surplus, then I think that's fine."

Non household customer, Public Services

6.2 Constraints on sharing water

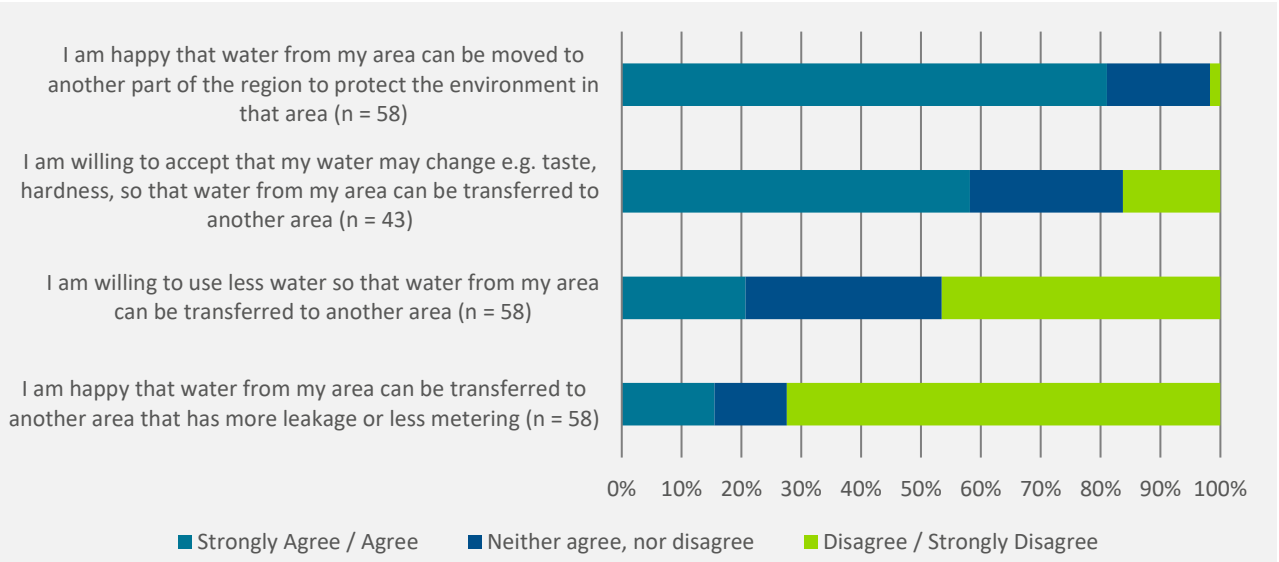
Following the unprompted discussions on the acceptability of sharing water, participants were asked a series of statements identifying any potential constraints they consider should be placed on water transfers.

- I am happy that water from my area can be moved to another part of the region to protect the environment in that area
- I am willing to accept that my water may change (e.g. taste, hardness), so that water from my area can be transferred to another area (Bristol and Wessex Water customers only)
- I am willing to use less water so that water from my area can be transferred to another area
- I am happy that water from my area can be transferred to another area that has more leakage or less metering

When asked about specific constraints on sharing water, participants strongly supported sharing to protect the environment. They expected that recipient areas should use water responsibly and meet similar standards. Support was lower if it could affect water quality in terms of taste or hardness, particularly amongst non-household customers.

The results confirm customers' strong support for protecting the environment, and their expectations that recipient areas should meet similar standards, including responsible use of water. Non-household customers shared these views.

Figure 6.1: Views on any constraints that should be placed on sharing water



Participants from Wessex and Bristol Water typically supported sharing water even if it meant that their water may change. At the start of the first session these customers were asked about their water supply and its acceptability in terms of quality. Although hardness was mentioned by some participants, most customers considered their supply to be acceptable and did not express any strong overall opinion regarding hard water or taste issues. That participants typically supported sharing water, even though it may lead to changes in taste or hardness, is therefore not very surprising. However, a higher proportion of non-household customers indicated that they were not willing to accept changes to their water quality in order to share water with other areas.

"[Changing] the water quality and stuff, that's something that I think would affect us, we've had days where we have different reservoirs here, and we've had days where it's completely put our coffee machine off and stuff just starts tasting weird, and the coffee guys come and taste the supply to see if it's been switched, because it messes with our coffee machine a bit so that would be an issue for us if it was constantly flip-flopping."

Non household customer, Hospitality

This potential issue may therefore warrant further testing in specific areas if a significant change to water quality is proposed as a result of sharing or transferring water.

6.3 Views on sharing water with other sectors

Support for sharing water resources with other sectors than the public water supply was more nuanced.

Customers' support for sharing water resources with other users within a regional plan was more nuanced. Overall participants were less aware of other water users and any potential implications and typically questioned the type of user before giving a response. Agriculture was often highlighted as a sector that it is important to share with and support, whereas industry and other users had more mixed reactions, often provoking comments regarding profits, "fat cats", and making sharing water dependent on perceived benefits to society.

"If they're growing crops, if they've got livestock, then we absolutely need to make sure they have enough water to keep that going."

Female, Aged 18-45, SEG C2DE, Wessex Water

"If we're talking about farmlands and people who provide something for us, like farmers, then I'd say that's fine. But if it's car companies, then no."

Male, Aged 18-45, SEG C2DE, Bournemouth Water

"We've obviously got to look after the farming community, because they're a part of the food chain. So, it depends on what the company is."

Male, Aged 65+, SEG ABC1, Wessex Water

"You would have to have some sort of league table as to how important it is for that company to have access to water or not. We're talking like extreme times here, aren't we, so I think power stations and the food chain are going to have the water."

Male, Aged 65+, SEG ABC1, Wessex Water

"I'd be a bit nervous…if they come back and they want ours and we only have enough for ourselves"

Female, Aged 65+, Future customer, Bristol Water

"I think fine as long as they're regulated and held to account for their usage – we can't be paying for them to misuse water"

Female, Aged 18-45, SEG C2DE, Bristol Water

Non-household customers were overall more supportive of sharing water with other sectors compared to household customers. They did however still caveat their support dependent on how essential the business is.

"I think when we talk about business livelihood, I think it's really important that they can keep their business going. So I think if we need to share it, if they can't do their original way, then I'm up for sharing it."

Non-household customer, Public sector

"I think it depends a lot on the essentialness of the business."

Non-household customer, Hospitality sector

"The sort of businesses, farms, breweries, paper producers, we all use them. If they stopped working because they didn't have water, we would all suffer in one way or another. If one is being pragmatic and intelligent about this, yes of course we would have to accept an increase on our bills to keep the luxuries of life that we want. A lot of this stuff is luxury. Our water supply is luxurious when you compare it to a lot of other places, if we want to ensure that it's going to continue and the luxuries that we want to enjoy too, then yes as businesses with domestic customers, we'll have to suffer increases in our bills."

Non-household customer, Development sector

7. Views on policy issues and constraints associated with the regional water resource plan

Summary of findings

- Participants agreed that affordability should be considered when developing regional plans, but views were mixed as to how this should be achieved.
- Customers supported investment now that would benefit future generations. They expect the cost to be spread out over the period to limit the bill impact.
- Participants did not express a strong view regarding how differences of view should be accounted for in regional planning, discussions typically reverting to the potential impact on bills.

The ways in a regional water resources plan should take different factors and principles into account were discussed in principle with participants. Whilst time constraints meant that not all topics were discussed with all groups, moderators ensured a good cross section of views were captured. Since these issues could only be explored in principle at this stage of the regional planning process, consideration may be given to further research once more information on cost, benefits and bill impacts is available.

7.1 Affordability

Participants agreed that affordability should be taken into account when developing regional plans, but views were mixed as to how this should be achieved.

Participants initial reaction in all groups was that affordability should be considered in developing water resource plans, even though they recognised the need for investment. The key reason was their view that water is a necessity not a luxury.

"[It's] crucial. Not everyone gets paid the same, some people might not be able to afford to pay a lot of money for water. It's a necessity, and it won't be held against them because you do need water to survive, but not all people can afford it."

Male, Aged 46+, SEG C2DE, South West Water

"It's one of our lower bills. It's essential, we need it, so I imagine it's inevitable like all energy, it's going to go up over time, especially if they're putting in more infrastructure, but again, if the public are seeing a breakdown of what their money's being spent on, how it's improving the infrastructure and not just paying big bonuses, I'm sure the people wouldn't mind."

Male, Aged 18-45, SEG C2DE, Wessex Water

"Cost is going to be an issue for a lot of people, but if you don't pay for it, it's never going to improve - it needs to improve for future generations."

Male, Aged 18-45, SEG C2DE, South West Water

However, views were mixed on how this should be achieved. External support via government, means tested bills and national pricing were all discussed. Some participants also indicated that personal responsibility to reduce usage if there are affordability issues should be encouraged (e.g. through compulsory metering). Some customers also reiterated their views that the water companies should fund the investment from profits, rather than increase bills.

"If you were talking about a national grid then yeah it absolutely doesn't matter cause everyone's gonna be paying into it, so it doesn't matter whether they're paying through their water company or through taxation, but I would also argue that tax should be means tested, so obviously then if it comes from the government, people that can afford it more are paying it, whereas if you're doing it at water [company] and you're charging people in all kinds of conditions and states of life, more for their water, that's like, water is an essential human need, I'm not sure that that should have a premium on it."

Non-household Customer, Hospitality Sector

"I don't think water – or the cost of water – should be means tested. That doesn't mean that I don't feel sorry for people that can't afford it and can't afford their bills but everyone should pay the same across the board, no matter who they are, because that's how much the water costs. If people pay for the water with wages that they've earnt working or benefits that they're entitled to, that should be what should be adjusted. If somebody is too poor to pay for water, they should be given more benefit - the water companies should still be paid the same amount of money because they need that money that's generated to keep the water going right."

Female, Aged 46+, SEG C2DE, South West Water

"It's a hard one really, because obviously, if you've got some people in different areas that are using a lot more water, I think that you've just got to work on individuals' needs really, and get them to limit to go with what they can afford."

Male, Aged 46+, SEG C2DE, Wessex Water

"You just need to spend some money on making it happen, really. It seems that nobody wants to invest any money, they just want to look after the shareholders and the directors."

Male, Aged 46+, SEG C2DE, Wessex Water

Interestingly, when asked specifically about affordability, participants did not specifically refer to their previous suggestions that increasing the price of water may encourage demand reductions.

7.2 Inter-generational fairness

Participants supported investment now that would benefit future generations but expect the cost to be spread out over the period.

Participants did not object to investment being made now that would largely benefit future generations. However, some customers flagged this was conditional on the size of the bill impact. They also often questioned how the cost would be spread, and typically expected it to be spread out over a long time period to minimise the impact.

"I feel like it depends how much more they're paying – I think my nan and grandad for example, I know they probably would put some money towards it but if their bill was going to be going up a lot to pay for stuff that just wouldn't benefit them, I'm not sure how inclined – they possibly would."

Female, Aged 18-24, Future Customer, Wessex Water

"That's the way the system works….I'm paying for people's kids to go to school but I've not got any going to school."

Male, Aged 65+, SEG C2DE, South West Water

"I think I wouldn't mind it as a gradual process because it's helping my children and grandchildren in the future, so I wouldn't mind it gradually. I think if we started with our generation and then built it up as we went along."

Female, Aged 65+, SEG ABC1, Wessex Water

"We've got two kids and if it's going to benefit them as they get older, then I'm all for that. And if the cost is spread out over time, then I'd rather that then think about them struggling unnecessarily down the line if we can have helped beforehand."

Female, Aged 18-45, SEG C2DE, Wessex Water

7.3 Inter-area fairness

Participants did not express a strong view regarding how differences of view should be accounted for in regional planning, discussions typically reverting to the potential impact on bills.

Respondents were asked about how the regional plan should be developed if different groups of customers had different opinions regarding the acceptability of the plan and any conditions that should be imposed on it.

Participants' responses were limited, with no consistent view regarding the need for a majority for example. Typically, the discussion reverted to the impact on bills. The need to educate customers and influence to build consensus was also suggested by one group.

"In the south-west, we pay more for our water, costs should be levelled out across the country."

Male, Aged 46+, SEG C2DE, South West Water

"I think it's not unreasonable for Wessex to try separate prices from Bristol. In theory every business should be held to their own account of quality standards, efficiency savings and all the stuff we were talking about earlier on in the session, so that in theory the water should be about the same. Now not every area or region or whatever in the UK will be the same price forever because they've got to pump water in from further away or whatever, but in theory the prices should be reasonably reflective of the efficiencies and stuff, but company to company they're never gonna be pound for pound the same or penny for penny, because they're different businesses with different procedures."

Female, Aged 18-45, SEG C2DE, Bristol Water

8. Conclusions

This deliberative customer research builds on existing insight to further develop customer and stakeholder evidence to inform and support the development of the WCWRG regional water resource plan.

66 household customers and 8 non-household customers were engaged in the research. Overall participant feedback on the sessions was positive, indicating a high level of engagement in the research and interest in the topic areas. The majority of participants strongly supported WCWRG consulting with customers on water resource planning.

Key findings – Water resources and supply resilience

Participants recognised that water resources are limited, the majority considering that they could use less water, although responsibility was frequently placed on others within their households. In contrast over half of non-household participants stated that their business would struggle to use less water. Participants were able to identify future pressures on water resources, focussing on challenges from increasing demand with lower awareness of any pressures leading to reductions in supply.

Customers typically accepted the imposition of less severe restrictions - hosepipe bans and non-essential use bans - provided the situation required it. For most participants, severe restrictions would be difficult to cope with and are not generally acceptable, although a significant minority were more confident that they could cope. Non-household customers mostly considered that severe water restrictions would have a detrimental impact on their businesses.

Participants supported a reduction in the risk of severe restrictions from the current standard of 1 in 200 years. However, there was no clear preference as to whether the reduction in risk should be to the extent of 1 in 500 years, or some point in between.

Participants supported protecting the environment at times of water shortages, even if it meant accepting more frequent imposition of less severe restrictions, such as hose pipe bans, and no reduction in the risk of severe water restrictions.

Key findings – Best Value Planning

Best Value Planning factors

Customers considered all four best value planning factors to be important, often struggling to decide the relative ranking.

Supply resilience was ranked highest priority on average for household customers, with little difference between the next two factors – improving the environment and reducing the demand for water. Benefitting and affordable for society was the lowest average priority. Some participants recognised that their support for supply resilience or environmental protection may decrease if costs were considered too high, or if it impacted affordability for lower income households.

Environmental ambition

Participants demonstrated strong support for improving the environment in the context of water resources. The message was consistent across the various ways we asked customers. Household customers typically preferred environmental improvements to be spread across all catchments, whereas non-household customers preferred concentrating larger improvements on a smaller number of catchments.

Regional planning

Participants support water companies working together to deliver a wider planning approach, with a preference for national planning over regional planning. Customers recognised that there may be benefits from considering water resources on a regional or national basis, but their support was caveated that there should be no detrimental impact on themselves, and by any cost implications.

Timing of investment

Participants strongly support investment in regional water resources being progressed in order to reduce the risk of water restrictions, even if there was an associated risk of incorrect assets being built and wasted investment. Even those customers who favoured a more 'wait and see' approach to investment tended to expect plans to be prepared so that they were ready to be implemented when required.

Key findings – Supply and Demand Options

No supply or demand options were considered unacceptable to customers. Support was strongest for reducing leakage, closely followed by reservoirs, and using education and awareness campaigns to reduce usage. Voluntary metering was the least supported option by some margin.

In general supply options were preferred over demand options. There was concern amongst participants as to whether people can be trusted to change behaviours and reduce demand in a sustained way, which strongly influences their views and preferences for demand options. In contrast supply options were seen as reliable. Customers also recognise that there is a need to use multiple approaches for water resource planning, rather than rely on a single approach or solution.

Supply options

Reservoirs, pumped winter storage and desalination were the more supported supply options. Participants preferred supply options that were seen to be reliable and produced large amounts of water. Cost was mentioned most often as an influencing factor.

Demand options

Reducing leakage and using education and awareness campaigns to encourage reductions in water usage were the most supported demand options. Whilst some participants continued to view leakage as wasteful and a 'no brainer' solution, there was indication that some participants had tempered their support in light of other considerations such as feasibility, disruption, and cost.

Support for voluntary metering was consistently low, with compulsory and smart metering preferred. Whilst this appears to be a change in attitudes given historical resistance to compulsory metering, it is consistent with participants' concerns whether people can be trusted to reduce demand consistently.

Proposed national policy targets

Views on the proposed national target to reduce water use to 110 l/hh/day by year 2050 were mixed, linked to perceptions regarding whether they trust demand reductions to be sustainable and the enforcement of any target.

Whilst participants strongly supported leakage reduction, at this stage in the planning cycle, it was not possible to further probe support for the specific 50% target without more detailed information regarding costs and impact such as disruption.

Key findings – Sharing water

In principle, participants were supportive of sharing water resources.

Participants strongly supported sharing water to protect the environment. They expected that recipient areas should use water responsibly and meet similar standards in terms of leakage, water use and metering. Support was lower if it could affect water quality in terms of taste or hardness, particularly amongst non-household customers. Customers also caveated their support in that the transfer should not impose any financial burden on supplier companies ('recipient pays').

Support for sharing water resources with sectors other than the public water supply was more nuanced, dependent on how essential the sector is perceived to be. Sectors such as agriculture or power were considered acceptable but sharing water resources with industry and other users generated more mixed responses.

Key findings – Policy issues and constraints for regional planning

Participants agreed that affordability should be taken into account when developing regional plans, even though they recognised the need for investment. However, views were mixed as to how this should be achieved.

Customers supported investment now that would benefit future generations. They typically expected the cost to be spread out over the period to limit the bill impact, and some customers flagged that their support was conditional on the size of the bill impact.

Participants did not express a strong view regarding how differences of view should be accounted for in regional planning, discussions typically reverting to the potential impact on bills.

Learnings from this deliberative research to inform any future research

This deliberative research has been completed early in the planning process to inform development of the regional plan. At this early stage, detailed information on proposed options, costs and bill impacts were not available. It is anticipated that further customer research will be undertaken once more detailed plans are developed.

This section highlights any specific points of learning that this research has identified, for consideration in any future customer projects.

- Environmental improvement - Whilst the majority of customers supported small environmental improvements on a large number of catchments, there were some notable variances. Participants preferring larger improvements on a smaller number of catchments were largely household customers from Bristol Water and Wessex Water, future customers, and non-household customers. There may be value in exploring these differences in future research when more specific environmental scenarios are available, as local knowledge and situations may influence views.
- Supply and demand options
  - Participants had no prior knowledge of pumped water storage and in some groups it was evident that their initial understanding of the option was unclear. Further explanation by moderators resolved the issue and participants were able to offer informed views on the option. It is recommended that the option description is reviewed, developed, and tested with customers to ensure better understanding in any future research
  - Whilst participants could understand the principles of the demand option to use tariffs to encourage demand savings, they struggled to appreciate how it could be applied in practice. Future research may benefit from specific options and examples in terms of both which tariff options could be used and how they would be applied in practice.
- National leakage policy target - Whilst participants' strongly support leakage reduction, more specific cost and impact information is required to test the acceptability of the specific target of a 50% reduction in leakage by 2050.
- Sharing water resources - Customer support for sharing water was lower if it caused a change in water quality in terms of hardness or taste. However, views were mixed with household customers more accepting than non-household customers. This potential issue may warrant further testing in specific areas if a significant change to water quality is proposed as a result from sharing or transferring water.
- The mini water resource planning exercise generated some valuable insight into participants' views, although some found it challenging. The exercise is considered appropriate for customers to complete in a more facilitated environment where the individual stages can be further explained as required, but it is recommended that any future exercises to be completed at home are simplified.

Appendix 1: Research Materials


WCWRG Reference Pack and home task.p


WCWRG Pre-reading pack.pdf


WCWRG Session 2 Showcards_v1.2.pdf


WCWRG Session 1 Showcards_v1.3.pdf

eftec
economics for
the environment

10F Printing House Yard, Hackney Road
London E2 7PR

+44 (0) 20 7580 5383

eftec@eftec.co.uk

eftec.co.uk

@eftecUK

Customer Research to Inform the Best Value Water Resource Plan for the South West

Quantitative Research Report

West Country Water Resources Group (WCWRG)

May 2022

10F Printing House Yard
London E2 7PR

+44 (0) 20 7580 5383
eftec@eftec.co.uk
eftec.co.uk

This document has been prepared for West Country Water Resources Group (WCWRG) by:

Economics for the Environment Consultancy Ltd (eftec)
10F Printing House Yard
Hackney Road
London E2 7PR
www.eftec.co.uk

Study team:

Jake Kuyer
Allan Provins
Boris Babic
Jo East (eftec associate)
Ali Chalak (eftec associate)

Disclaimer

This report has been prepared in accordance with our Proposal dated 19th March 2021 and agreed revisions to it. We are reliant on the information provided by you, that is available in the public domain and that we collected for the purposes of this project. While we have endeavoured to provide accurate and reliable information, we are not responsible for the completeness or accuracy of any such information. This report is intended solely for the information and use of WCWRG and is not intended to be, and should not be, used by anyone other than the specified parties. eftec, therefore, assumes no responsibility to any user of this document other than WCWRG.

Document evolution

Quantitative Research Report	20/05/2022	Reviewed by Allan Provins

eftec offsets its carbon emissions through a biodiversity-friendly voluntary offset purchased from the World Land Trust (http://www.carbonbalanced.org) and only prints on 100% recycled paper.

Executive summary

Introduction

WCWRG is developing the regional water resource plan for the South West. The aim is to ensure that water supplies are managed and secured over the long term, meeting the needs of households and businesses now and in the future. The plan will address future challenges including changing climate, changing weather patterns, and population growth. It will need to balance enhanced levels of drought resilience and environmental protection with ambitious targets for reducing leakage, water use and carbon emissions, along with the cost and pace of investment needed to deliver the plan, particularly taking account of the affordability for customers.

This report summarises the approach, method, analysis, and findings from quantitative research that examined customers' preferences for the regional plan outcomes and constraints. It is complemented by qualitative research that addressed the broader policy and strategic issues for the regional plan[1].

Research approach

The quantitative research used a stated preference methodology and involved the design, testing, implementation, and analysis of a customer survey. The core component of the survey was a choice task in which customers selected their preferred scenarios for the regional plan. The scenarios were described in terms of the key regional planning outcomes and associated constraints:

- Risk of severe water use restrictions during drought
- Protecting and improving the environment
- Reducing carbon emissions
- Reducing leakage
- Reducing per capita consumption (PCC), and
- Impact on customer bills

The main results are customer preference weights and values that quantify the relative importance of these outcomes and constraints. The results also provide a basis for estimating the level of customer support for alternative scenarios for the regional plan.

The survey was implemented with representative samples of household (n = 1,504) and non-household customers (n = 304). A good geographic spread of respondents was achieved across the WCWRG region overall and for each company area (Figure S.1).

[1] eftec and ICS Consulting (2022) Customer Research to Inform the Best Value Water Resource Plan for the South West, Qualitative Research Report, West Country Water Resources Group, May 2022.

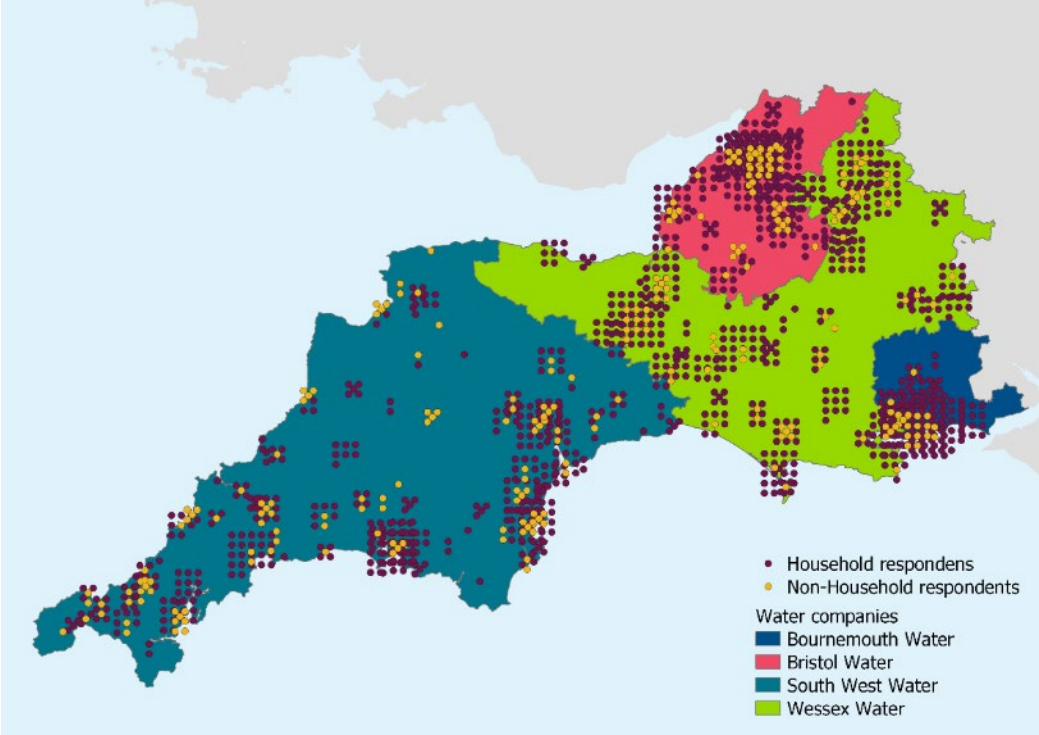


Figure S.1: Geographic profile of household and non-household samples

The overall survey results, respondent feedback, and findings from the survey testing stage indicate that customers engaged well with the survey content, understood the choice task exercise, and provided considered responses.

Main findings

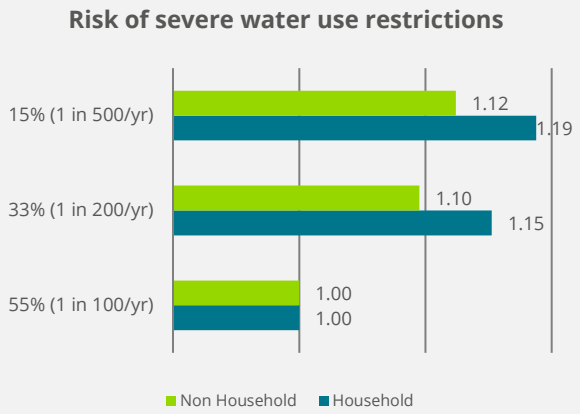
The choice task results are robust and provide a coherent view of customer preferences for the regional plan (Box S.1). The main findings include:

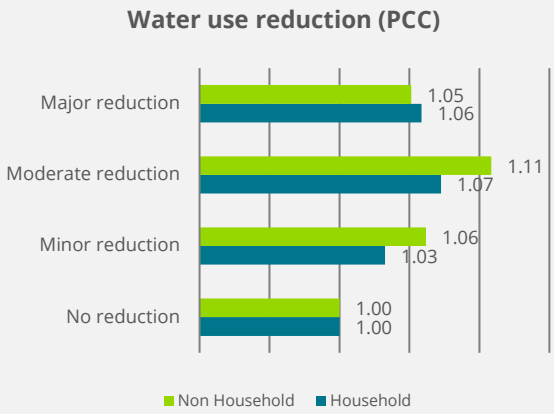
- Respondents recognised the impact and disruption that severe water use restrictions during a period of prolonged drought would have on daily activities. However, it is evident that the perceived benefit of moving from a 1-in-200 to a 1-in-500 risk level is relatively marginal for customers. Greater weight was placed on achieving the 1-in-200 level versus a deteriorated level of service at 1-in-100.

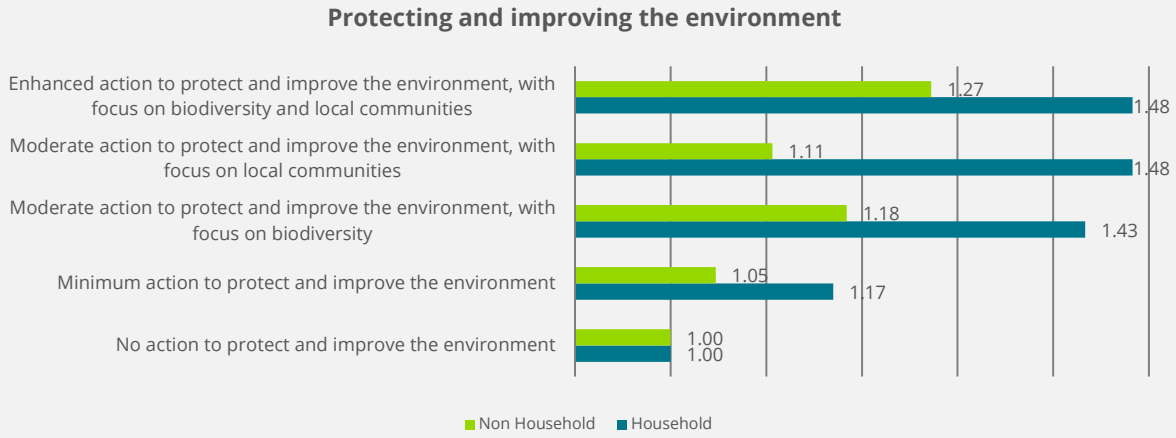
- There was strong support from both household and non-household respondents for measures that will reduce the dependency of the water supply system on surface and groundwater abstractions, particularly from sensitive catchments. There was a clear preference for going beyond the minimum requirements for the environmental ambition of the plan, to provide enhanced outcomes for biodiversity in the region and also benefit communities by improving local environmental quality.

Box S.1: Customer preferences for the regional plan

The charts below present customer preference weights for specific aspects of the regional plan, including the level of drought resilience (risk of severe water use restrictions), reducing water use (reduction in PCC), and environmental ambition. Results for leakage and net zero carbon are available in the main report. Higher preference weight values indicate a stronger level of preference, showing the outcomes/targets that were most preferred by household and non-household respondents.







For both household and non-households there is relatively marginal additional weight placed on achieving 1-in-500 risk for severe water use restrictions, although it is the most preferred risk level overall. A moderate reduction in water use (consistent with 110/p/d target) was the preferred level for water saving efforts. Finally, there is a clear preference from both households and non-households for enhanced environmental outcomes beyond the minimum requirements to the regional plan.

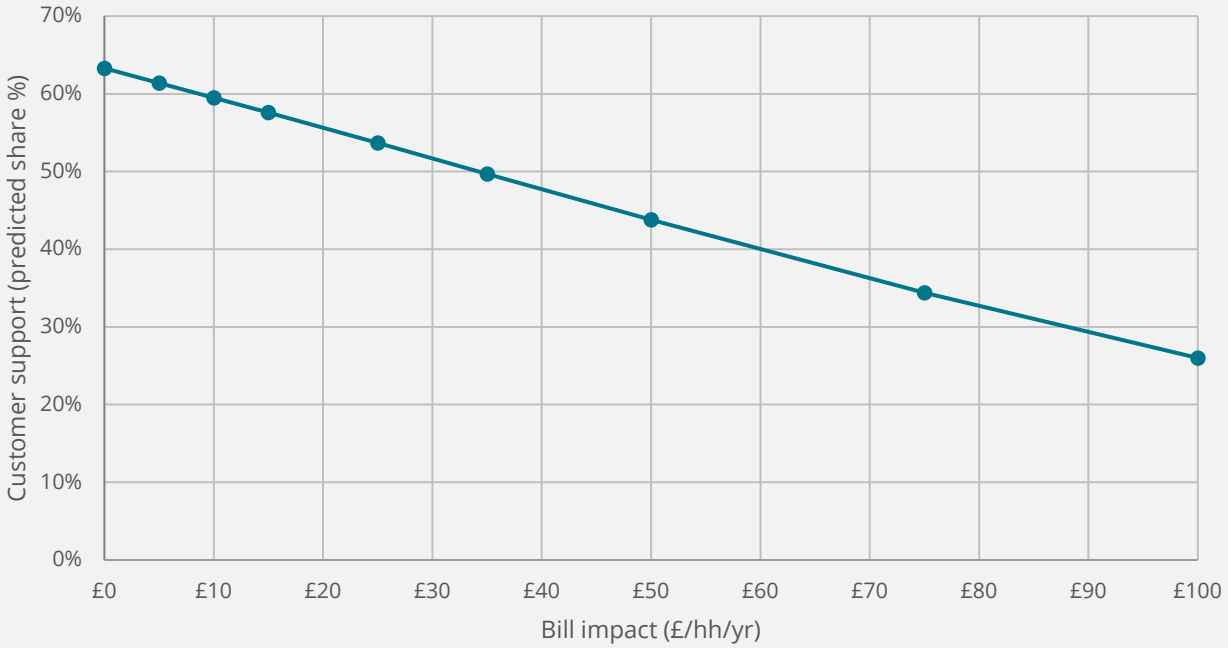
- Targets for net zero carbon and increased effort to reduce leakage tended to be secondary factors for customers. Household respondents had a clear preference for the 50% reduction in leakage target to be achieved by 2050. Non-households, however, did not favour enhanced effort for reducing leakage over continuing levels of repair and maintenance. Whilst there was a good level of support from both household and non-household customers for companies' ambition to achieve net zero across operations by 2050, there was no over-riding preference for achieving emissions reductions earlier. In general, reducing carbon emissions was not seen as the top priority for the regional plan given other needs around drought resilience and environmental protection.

- There was a willingness on the part of respondents to undertake actions that would reduce water use, but a large share of respondents also had the view that more support was needed from companies and Government to help achieve this. The strongest level of support from both households and non-households was for a moderate level of reduction in water use. The survey results suggest that customers may perceive a disbenefit – in terms of impacts on day-to-day use of water – from reductions below 110/l/d. Beyond this point, it appears that the impact on customers' use of water starts to outweigh the preference that they have for taking actions that help protect the environment.

Overall, the research shows that there is a good level of support for the outcomes and targets that the regional plan is aiming to achieve and - particularly in relation to the environmental ambition – a preference for companies to go beyond the minimum requirements. The tipping point, in terms of support for the plan from the majority of customers, appears to be around £30 per year (Box S.2). Below this a larger share of the customer base would likely see the plan as "value for money". Above it fewer would likely be supportive of the plan, even if it offered enhanced environmental outcomes over the minimum requirements.

Box S.2: Customer support for the regional plan

The chart below shows the estimated level of support for the regional plan (household customers) at varying levels of bill impact from 2025. At a relatively modest level of annual bill increase (around £5/hh/yr) support for the plan is estimated to be above 60% of the regional customer base. The level of support drops below 50% around a bill impact of £35 per household per year. Less than one-third of customers would support the regional plan if the bill impact was greater than £80 per household per year.



Notes: Regional plan scenario defined as:

- Risk of severe water use restrictions during drought: 1-in-500
- Protect and improve the environment: minimum action
- Reduce carbon emissions: net zero by 2050
- Reduce leakage from pipes: 50% reduction target met by 2050
- Help to reduce the amount of water people use: moderate reduction in use (110l/p/d)

Conclusions

In combination the two phases of research carried out for WCWRG provide a wide-ranging view of customers' priorities that will support the development of the best value regional plan for the South West.

The quantitative research focuses on customer preferences for the long-term outcomes and the relative importance of different aspects of the plan. The survey testing stage and respondent feedback indicated that the study results are valid from a customer understanding perspective. The survey produced a rich dataset on customer preferences and the empirical results are robust with a reasonable fit to the data. Overall, the study provides a sound basis for understanding the level of customer support for the plan and it provides a view on the refinements and adjustments to the plan that could make it more appealing, particularly in relation to the trade-off between risk/resilience – environment – and cost.

Contents

1. Introduction

Setting the scene

The long-term, reliable supply of water is vital to supporting our economy. This is particularly important in the West Country especially in the summer months due to the high levels of tourism[3]. Whilst the region has not had to experience any severe restrictions that limit water availability since the 1976 drought, with a changing climate, there is an increased risk of severe droughts.

Fundamentally, water resource planning needs to reflect a changing world. Changing climate, changing weather patterns, population growth, and growing demand for environmental protection mean that across the UK, and the South West in particular, there are critical challenges – but also opportunities - in developing long term plans regionally and collaboratively. In the water industry, companies and stakeholders are working together to develop regional plans which ensure that water supplies are managed and secured over the long-term, meeting the needs of households and businesses now, and in the future.

These regional plans need to balance these pressures including increasing levels of water stress, drought and supply resilience, increasing demand for an enhanced and protected environment, and affordability. How these challenges and opportunities are best addressed requires an understanding of the views and preferences of customers, to ensure that the policy at the heart of water resource plans continues to deliver for customers and stakeholders alike.

1.1 Background

West Country Water Resource Group (WCWRG) - formed in 2017 in response to the wider national need for a more strategic approach to water resources management - is an alliance of the three water companies that supply the South West region of England (Bristol Water, South West Water including Bournemouth Water and Wessex Water). Working with a range of supporting organisations linked to the water environment, WCWRG is responsible for producing a long-term, strategic plan for managing water resources in the region across public and non-public water supply.

The WCWRG water companies have already engaged with customers and stakeholders – through PR19 and as part of their business-as-usual activities. This project builds on this existing insight to further develop customer and stakeholder evidence to inform and support the development of the regional water resource plan. The overall purpose of this project is to support WCWRG in formulating the best value regional plan for the South West. The aim is to develop the evidence base on customer and stakeholder preferences for the various outcomes associated with the planning objectives. The broad topic areas are:

- **Drought resilience** – preferences for further reductions in risk drought measures (e.g. hosepipe bans) and emergency drought restrictions (e.g. rota cuts/standpipes)
- **Environmental ambition** – support for investment beyond the minimum requirement to reduce the dependency of the water system on sensitive habitats to wider river and groundwater sources
- **Wider societal benefits** – preferences for the broader public value that can be delivered by the plan, including carbon savings, health and wellbeing, and amenity and recreation benefits for communities
- **Risk** – attitudes to the level of risk and resilience to future uncertainties and pressures from population

growth, consumption levels, weather patterns and climate
- **Timing** – views on the balance of early investment to reduce risk versus future investment to maintain customer bill levels in the short term
- **Trade-offs** – views on the constraints on the plan in terms of the acceptable/unacceptable trade-offs between risk, service levels, dependency on the environment, and bills
- **Option types –** preferences for individual supply and demand options and the overall balance between them within the plan
- **Inter-company transfers** – views on sharing water with neighbouring companies or further afield, as a "suppliers" or "recipients"

A combination of evidence review, qualitative research and quantitative research methods has been used to develop the evidence. This report summarises the approach, method, analysis and findings from quantitative research conducted with a representative sample of customers in early 2022, which focussed primarily on preferences and priorities concerning the trade-offs around the key planning outcomes for the regional plan: risk of emergency drought restrictions, environmental ambition, cost (bill impact to customers) subject to the main planning constraints/targets (net zero carbon, leakage reduction, per capita consumption). An accompanying report summarises the findings from qualitative research carried out with customers in Summer 2021, which addressed a wider set of topics concerning policy and strategic issues for the regional plan[2].

1.2 Research aims

The purpose of the quantitative research was to examine customer preferences in relation to:

1. **Water resource planning outcomes:** understanding the relative priority customers place on outcomes that water resource planning can deliver, broadly in terms of trade-offs between:
   - Risk and likelihood of severe drought restrictions and resilience to future shocks;
   - Environmental ambition; and
   - Cost.
2. **Water resource planning constraints:** understanding customer preferences for different options for delivering the plan, in terms of industry targets for water leakage reduction (50% reduction by 2050), carbon emissions reductions (net zero by 2050), and achieving a reduction in per capita consumption (PCC) to 110l/p/d.

The research scope covers both household and non-household customers. The outputs are intended to help shape the regional plan as well as provide results that are compatible with the individual water companies' WRMP investment modelling processes. The approach taken was intended to be consistent with the broad framework outlined in the UKWIR guidance on best value and the multi-criteria decision analysis (MCDA) for water resource planning[3].

[2] eftec and ICS Consulting (2022) Customer Research to Inform the Best Value Water Resource Plan for the South West, Qualitative Research Report, West Country Water Resources Group, September 2021.
[3] UKWIR (2020) Deriving a Best Value Water Resources Management Plan: Final Report.

The research used a stated preference approach, which is the appropriate methodology for estimating robust quantitative evidence in terms of customer preference weights that show both: (a) ranking; and (b) relative importance of either water resource planning outcomes or constraints. The practical methodology involved the development, testing, and implementation of a stated preference survey and choice task, which generated a robust dataset for analysis.

1.3 Report structure

The structure of this report is as follows:

- Section 2 provides an overview of the research approach, survey design and testing, overall survey structure and content, and the sampling approach.
- Section 3 presents the household survey results, including sample profile and customer views on a number of aspects of the regional plan.
- Section 4 presents the non-household results, including sample profile and customer views on a number of aspects of the regional plan.
- Section 5 reports the customer preference analysis, presenting the main findings in terms of customers' priorities for the regional plan.
- Section 0 provides a summary of the key findings and conclusions from the research.

The report is accompanied by the following supporting annexes:

- Appendix 1: Summary of cognitive interviews
- Appendix 2: Household survey
- Appendix 3: Non-household survey
- Appendix 4: Onscreen appearance and layout of the survey
- Appendix 5: Summary statistics
- Appendix 6: Choice model estimations
- Appendix 7: Best valuing planning weights

2. Approach

Summary

- The customer survey was developed through an iterative test and re-test approach using one-to-one cognitive interviews and a pilot survey.
- Two variants of the survey were developed – one for household customers and a second for non-household customers – structured to collect inform on customer preferences and priorities for the WCWRG regional plan.
- The sampling approach reflected the research objective to provide regionally representative results regarding water service customers in the West Country region.

2.1 Survey design and testing

Overview

The quantitative research and survey content was developed with input from WCWRG, based on expected evidence needs for developing both the regional plan and companies' individual WRMPs. The approach was based around the development of a stated preference survey and choice task to examine customer preferences for the regional water resource planning outcomes and constraints. Stated preference methods are survey-based approaches that present respondents with simulated choices to measure their preferences and valuations for particular goods, services, or outcomes. The central component of a stated preference survey is a 'choice task', or sequence of choice tasks, in which respondents are asked to make decisions regarding the provision of the good/service/outcome of interest. The choices that respondents make reveal their priorities.

There are various choice task formats that could be used to examine customer preferences in the context of the WCWRG long term regional plan for water resources. A discrete choice experiment (DCE) approach was selected as this allowed the research to examine preferences for different "levels" of outcomes (e.g. going beyond minimum requirements for the environmental ambition of the plan). The conventional approach to a DCE involves a (representative) sample of respondents (customers) selecting their preferred option/scenario from 2 or more alternatives in a repeated choice exercise. In this case a "scenario" represents a particular profile for the regional plan in terms of outcomes (risk of severe drought restrictions, environmental ambition, cost) and constraints (leakage target, net zero carbon target, PCC target).

The DCE approach produces data that can be used to quantify customer priorities (preference weights) and estimate customer support for alternative regional planning scenarios (predicted shares). The inclusion of cost – in terms of bill impact – also means that the value of planning outcomes in terms of customer willingness to pay (WTP) can also be estimated from the choice task data and results.

Cognitive interviews

The initial survey content and material was developed from a review of previous research carried out by companies and incorporated relevant findings from the qualitative research phase, which included insights on customer understanding and views around water resources supply resilience, best value planning, supply and demand options, and policy issues and constraints. This was further developed and refined via an iterative testing process conducted via one-to-one online cognitive interviews with a small sample of household customers. The interviews covered the main aspects of the survey content and material to gain customer feedback on overall understanding of the survey, the ease/difficulty of completion, and perceived credibility.

Findings from the cognitive testing process are summarised in Table 2.1 Summary of key findings from cognitive interviewsTable 2.1. Overall, the findings from the testing confirmed the selection of the DCE choice task format for the research and helped to refine the design to take account of a number of considerations, including the amount of supporting information needed to prime respondents on the regional plan outcome and constraints, the instructions for answering the choice task, and its complexity in terms of the definition of the plan outcome/constraints and "levels".

Table 2.1 Summary of key findings from cognitive interviews

Subject	Key findings	Example feedback from respondents
Understanding	• Overall, respondents understood what the survey was about and what they were being asked to do in the choice exercise.	*"They have finite resources with difficult decisions to make that reflect government policy and the wishes of customers" – Wave 2* *"Gain a general consensus on what people think should be a priority" – Wave 3*
Views on WCWRG consulting customers	• Overall, respondents thought it was a good thing that WCWRG was consulting customers about potential future plans for improving the water resource situation in the South West. • Respondents were hopeful that their opinions would mean something and that the results would influence decision making, especially where there is a consensus on a number of issues.	*"Hopefully it provides a fair balance of views for them to make the hard decisions" – Wave 1* *"I hope it will have a big influence, that they will take most points of view into account and have a big impact" – Wave 3*
Ease of survey completion	• Respondents found the survey fairly easy to understand and straightforward to complete. • Respondents felt the subject matter was something that resonated quite strongly and which they could engage with.	*"...quite easy to think about once I got my head round the wide-ranging responsibilities they have" – Wave 2* *"...quite informative, lot's information provided in order to understand the questions" – Wave 1*
Different aspects of the regional plan	• The information on the regional plan outcomes and constraints was found to be clear, concise and easy to understand.	*"It works, it highlights the issues and the need for some semblance of priority" – Wave 1* *"Does what it need to do, but it's really hard to answer, as all of them are important" – Wave 1*
Choice task attributes	• Each of the attributes was fairly self-explanatory to respondents, although the wording around 'reducing dependency of water system on rivers and groundwater' was	*"...yes, talking through these elements does feed you enough information provided you've read it" – Phase 1*

Subject	Key findings	Example feedback from respondents
	perceived as being more complicated than it needed to be. • The contextual information provided in the warm-up section and lead-in was considered enough to inform people and enable them to make their choices.	*"It's good to have the previous information at the beginning, it gave me a pictorial view as well" – Wave 3*
Discrete choice experiment (DCE)	• The majority of respondents found the instructions clear and easy to follow. • There were some respondents who found the choices challenging, not because they didn't understand the concept, but because 'it was hard to decide what was most important'.	*"It was straightforward and no problems choosing which was most important" – Wave 1* *"…quite easy to think about once I got my head round the wide-ranging responsibilities they have" – Wave 2*
General points	• There was agreement that the both the survey general, and the choice tasks specifically were credible. This was due to the clarity of questions and the background information that was provided.	*"What do people want and how much do they want to spend" – Wave 1* *It was in-depth enough to get people's true opinions" – Wave 3*

Pilot survey

The survey was pilot tested with 250 respondents to check length and time to complete and ensure that the routing of the survey and data collection were functioning correctly. For the most part the analysis the choice task data from the pilot was in line with expectations. Following the pilot and a final review by WCWRG, some minor updates were made to the survey content, including a refinement of the environmental ambition attribute.

2.2 Survey structure and content

The structure of the survey is set out in Table 2.2. The questionnaire material was developed as a single survey with household and non-household customer variants. The survey was developed as a single questionnaire with household and non-household variants. Appendices 2 and 3 provide the household and non-household surveys, respectively. The key content in each section of the survey is described subsequently.

Introduction

The introduction to the survey explained the role of WCWG and the development of the long-term plan for the South West and the purpose of the survey.

Section A: Respondent screening and quotas

The screening and quota questions were specified to ensure a representativeness sample of customers for the South West region. Household respondents were screened to sample only customers who lived within one the four WCWRG companies' areas. Non-households were screened so that the respondent was responsible – or jointly responsible - for their organisations decision-making with respect to utilities, and that the business operated within at least one of the four WCWRG water companies' areas. Details for respondent quotas are provided in Section 2.3.

Table 2.2: Survey structure

Section	Content
Section A	Screening and sample representativeness – upfront questions to ensure the respondent profile is consistent with the sampling requirements
Section B	Experience, perceptions, and attitudes – 'warm-up' questions that introduce the respondent to the long-term water resource planning context and the role for customer views in helping shape future plans
Section C	Choice task(s) – the stated preference exercise (DCE) including instructions and guidance for answering the choice task
Section D	Follow-ups – a sequence of questions to probe respondents' motives and understanding of the choice task in order to assess the validity of their responses (e.g. testing for certain response biases) and other supplementary questions to collate supporting evidence (e.g. views on long-term planning aims)
Section E	Other respondent profile information – a final set of questions that obtain the socio-economic and demographic characteristics of the respondent (households) or business profile (non-households) to support the segmentation of results
Survey close	Thank and close

Section B: WCWRG regional plan

The initial content in the survey set out the context and main elements of the regional plan in terms of the outcomes and constraints. These were presented via a sequence of show screens (Figure 2.1) and warm-up questions intended to prompt on respondent thinking, covering aspects such as awareness of the disruption that could be caused by severe water use restrictions in extreme drought conditions, attitudes and views in relation to environmental protection and improvements, reducing carbon emissions, reducing leakage, and reducing water use.

Figure 2.1: Description of regional plan outcomes and constraints

Increasing the resilience of the water supply system

The WCWRG plan will reduce the risk of severe water use restrictions during drought

- Early measures to respond to drought include actions such as campaigns for people to reduce their water use and hosepipe bans, etc. However, during an extreme period of drought, emergency measures may be needed to maintain an essential supply of water (e.g. for drinking and basic hygiene).
- Emergency measures would be very disruptive and could last for several weeks or months, and could include:
  - Water supply to properties restricted to a few hours a day ("rota cuts") and the provision of water via collections points ("standpipes" or bottled water), meaning people would not have access to running water for drinking, flushing toilets, washing etc. for the majority of the day.
  - Closure of schools, shops and other business, and public transport for health and safety reasons related to water restrictions.

There is about a 33% chance that a person will experience severe water use restrictions during their lifetime based on current levels of risk.

Protect and improve the environment

The WCWRG plan will help protect and improve the environment

- Some of the water supplied to the West Country is from sources that are unique and important habitats for wildlife. As a minimum the plan will aim to reduce the amount of water taken from these habitats in order to protect them from harm and damage.
- Biodiversity is the variety and abundance of life, such as plants and animals in nature, and is the basis for a healthy environment. WCWRG can aim to ensure that its activities improve the overall level of biodiversity in the environment and compensate for any losses due to construction works and building new water supply sources.
- The environment provides a wide variety of benefits to people. WCWRG can aim to have a positive impact on the local environment for people and communities, such as reducing the risk of flooding, improving water quality, providing amenity for recreation, and restoring habitats.

Some rivers and other sources of water in the West Country are unique and important habitats for wildlife and plants, such as chalk streams, which can be sensitive to low water levels

Reducing carbon emissions

The carbon impact of the WCWRG plan

- All water companies in England and Wales have committed to achieving net-zero carbon within their day-to-day operations by 2030. This means that there is an equal balance between the amount of carbon emitted and the amount removed from the atmosphere.
- Low carbon approaches can be used to save energy and minimise the amount of carbon emitted by the plan. Unavoidable emissions can be balanced by carbon saving projects outside the water sector.
- The plan has a further ambition to achieve net-zero carbon, beyond their day-to-day operations, to cover all aspects of the water supply system including the carbon emitted in the production of products and services (the 'supply chain') that WCWRG uses by 2050.
- Achieving carbon reduction targets helps contribute to reducing the future impact of climate change.

Increasing the resilience of the water supply system and protecting and improving the environment may require options that increase carbon emissions. This has a negative impact on the wider environment which needs to be considered.

Reducing leakage from pipes

Water lost due to leakage

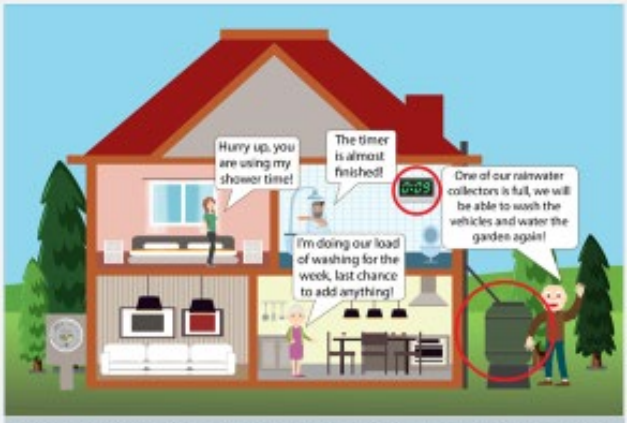
- Leaks affect all parts of the water supply network, including big water mains, smaller distribution pipes to homes and organisations, and customers' own pipes. Customers are responsible for fixing leaks from pipes on their own property.
- In England and Wales, approximately 20% of water put into the supply network is lost due to leakage. All water companies in England have agreed to a target to reduce leakage by half by 2050. This would mean that around 10% of water in the system would be lost from leakage.
- Fixing leaks can be difficult - once the easiest leaks are fixed further reductions can require significantly more work to find and repair. Achieving '0% leakage' is not possible as ongoing work would be needed to continually address new leaks as they occur.
- The impact of reducing leakage is that less water has to be taken from the environment and treated to supply customers.

Fixing leaks in public places can require significant works, including roadworks which would be disruptive to traffic, local residents, and businesses. Fixing leaks on customer property is the responsibility of the property owner.

Helping to reduce the amount of water people use

Customers water use

- On average, each person uses around 140 litres of water in their home each day. If less water is used, then less water needs to be taken from the environment and less investment is needed to build new water supplies as the population grows.
- There are various measures to help people save more water in and around their homes, such as:
  - Providing households with water-saving information and advice or providing water-saving devices (e.g. for showers, toilets, taps, combi-boilers, etc.).
  - Increasing the number of customers who have water meters and implement smart metering (either voluntary or compulsory).
- Stronger measures to save water could involve more recycling in homes (e.g. water from showers, sinks, or rainwater) and behaviour change (e.g. shorter showers, less dishwasher and washing machine cycles, less watering of gardens).



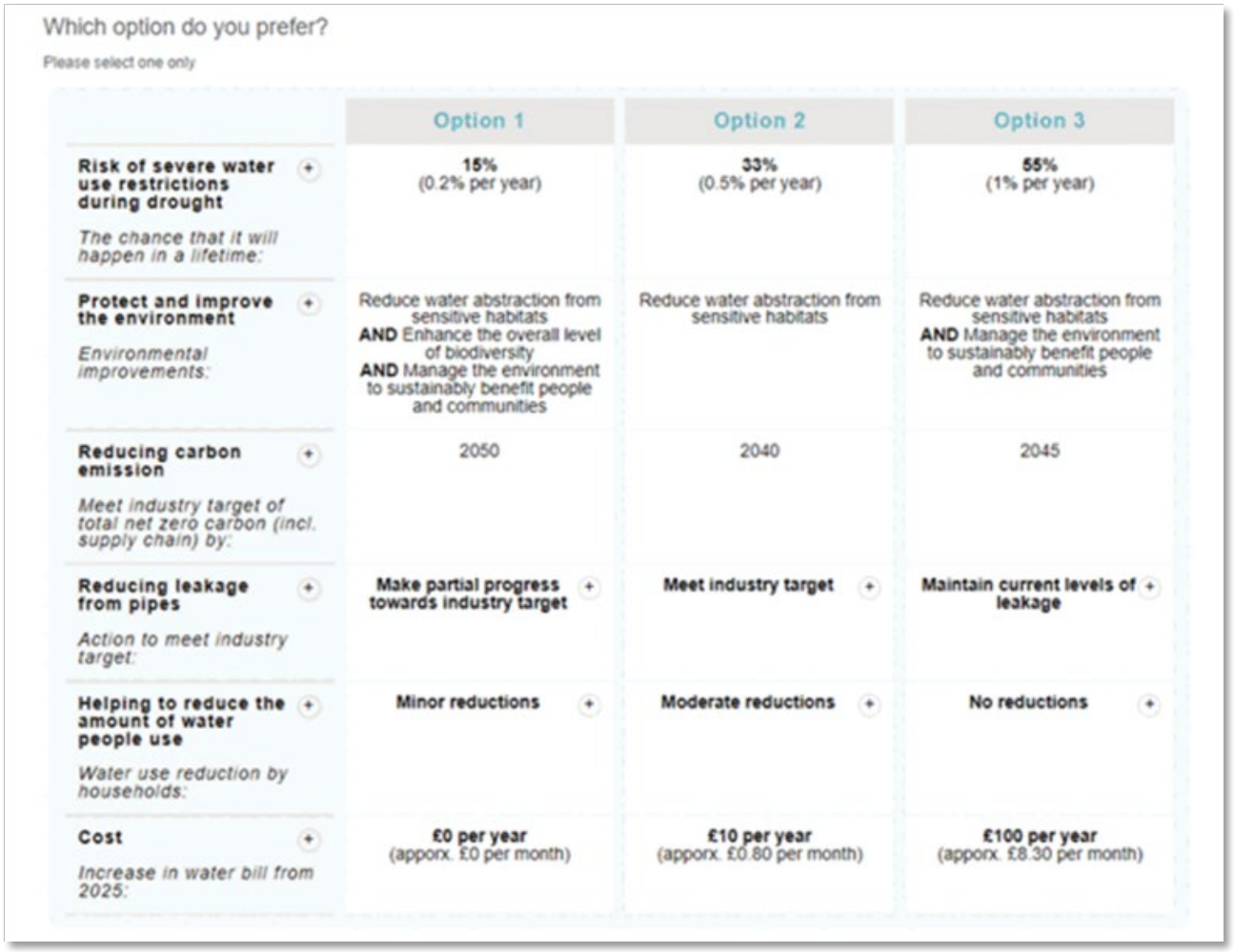
The WCWRG plan can support customers to use less water through water saving devices and recommendations for behaviour change. Reductions in water use lead to lower demand on the water supply system and the environment.

Section C: Choice task

The introduction to the choice task informed respondents that the aim of the WCWRG regional plan was to: (a) increase the resilience of the water supply system to reduce the chance of severe water use restrictions being needed during an extreme drought; and (b) protect and improve the environment by reducing the amount of water taken from sensitive habitats, as well as improving biodiversity and having a positive impact on the local environment for people and communities; subject to reducing carbon emissions, reducing leaks from pipes, helping to reduce the amount of water people use, and the impact on customers' bills.

Within the choice task respondents were shown different options (scenarios) for the regional plan, which varied the levels of the outcomes and constraints. Each choice featured three options for the plan as illustrated in Figure 2.2. Respondents were asked to select: (i) their most preferred scenario for the regional plan from three options shown, and then (ii) their preferred scenario from the two remaining options. A total of eight choice tasks were presented in total, each with varying levels and trade-offs between the plan outcomes, constraints and bill impact levels.

The onscreen appearance of the choice task was augmented by rollovers for all attributes and levels, giving text and visual reminders of the plan outcomes and constraints. Respondents were also presented with a conventional budget reminder screen that asked them to consider whether options and plan outcomes were important to them, and to take into account their overall household income expenses (including the effect of inflation over time).



Which option do you prefer?

Please select one only

	Option 1	Option 2	Option 3
Risk of severe water use restrictions during drought *The chance that it will happen in a lifetime:*	**15%** (0.2% per year)	**33%** (0.5% per year)	**55%** (1% per year)
Protect and improve the environment *Environmental improvements:*	Reduce water abstraction from sensitive habitats **AND** Enhance the overall level of biodiversity **AND** Manage the environment to sustainably benefit people and communities	Reduce water abstraction from sensitive habitats	Reduce water abstraction from sensitive habitats **AND** Manage the environment to sustainably benefit people and communities
Reducing carbon emission *Meet industry target of total net zero carbon (incl. supply chain) by:*	2050	2040	2045
Reducing leakage from pipes *Action to meet industry target:*	**Make partial progress towards industry target**	**Meet industry target**	**Maintain current levels of leakage**
Helping to reduce the amount of water people use *Water use reduction by households:*	**Minor reductions**	**Moderate reductions**	**No reductions**
Cost *Increase in water bill from 2025:*	**£0 per year** (approx. £0 per month)	**£10 per year** (approx. £0.80 per month)	**£100 per year** (approx. £8.30 per month)

Figure 2.2: Choice task layout

The design of the choice task (most preferred option; second most preferred option) gives a full preference ordering and rich dataset for the analysis of customer preferences. It enables the estimation of customer preference weights that show both the ranking and relative importance of the regional plan outcomes or constraints. The inclusion of the bill impact (cost attribute) also allows the estimation of customer WTP for the plan outcomes. Section 5 describes further the analysis of the choice task data.

Attributes and levels

The choice task attributes and levels (plan outcomes and constraints) were specified in conjunction with input from WCWRG. The basic descriptions follow the description of the regional plan presented to respondents in Section B of the survey:

- **Risk of severe water use restrictions during drought**: the chance that it will happen in a lifetime.
- **Protect and improve the environment**: level of action.
- **Reducing carbon emissions**: meet industry target of total for net zero carbon (including supply chain).
- **Reducing leakage from pipes**: meet industry target of 50% leakage reduction.
- **Helping to reduce the amount of water people use**: water use reduction by households:
- **Cost**: change in customer bills from 2025.

Table 2.3 presents the attributes levels presented in the choice task. The ranges specified were based on the requirements of the regional plan. Resilience – framed around the impact on customers in terms of risk of severe water use restrictions – featured the target level of 1-in-500 risk, which was also expressed as the lifetime risk for a customer (15% chance). Lower levels of resilience were defined according to the pre-2020 planning level (1-in-100) and the proximate current level of risk for the region (1-in-200).

The environmental outcome was specified from "no action" to the minimum level of action required by the national planning framework to further enhanced levels of action that either focused on outcomes for improving biodiversity in the region or benefits to local communities, or both. These levels were specified in accordance with input from WCWRG.

Reductions in carbon emissions and leakage were defined in line with sector level targets. Carbon was presented as the timescale for achieving net-zero (either 2050 or earlier at 2040). Leakage was presented as achieving the 50% reduction by 2050 or as a lower level of effort that would see a continuation of current investment levels and a focus on other priorities.

Per capita consumption was presented as four possible levels, ranging from "no reduction" (140l/p/d) to "major reductions" (100l/p/d). Descriptions of water use and customer behaviour were provided by WCWRG for each PCC level.

The change in customer bill was presented as an annual increase from 2025 onwards. Nine levels were specified with both annual amount and equivalent monthly amount presented to respondents (annual amounts: £0, £5, £10, £15, £25, £35, £50, £75, £100). In the non-household version of the survey, the bill amount was shown in percentage terms relative to the average bill amount (0, 3%, 5%, 8%, 13%, 18%, 25%, 35%, 50%).

Table 2.3: Choice task attribute levels (outcomes and constraints)

Attribute	Level 1	Level 2	Level 3	Level 4	Level 5
Risk of severe water use restrictions during drought *The chance that it will happen in a lifetime:*	55% chance in a lifetime This is equivalent to 1 in 100 risk in any year This is the level of risk that water companies were required to plan for before 2020	33% chance in a lifetime This is equivalent to 1 in 200 risk in any year This is half of the level of risk that water companies were required to plan for before 2020	15% chance in a lifetime This is equivalent to 1 in 500 risk in any year This is one fifth of the level of risk that water companies were required to plan for before 2020		
Protect and improve the environment *Level of action:*	No action to protect and improve the environment Maintain current levels of water abstraction from sensitive habitats This is below the minimum requirement that water companies have to plan for	Minimum action to protect and improve the environment Reduce water abstraction from sensitive habitats This is the minimum requirement that water companies have to plan for	Moderate action to protect and improve the environment, with focus on biodiversity Reduce water abstraction from sensitive habitats AND Enhance the overall level of biodiversity This is above the minimum requirement that water companies have to plan for	Moderate action to protect and improve the environment, with focus on local communities Reduce water abstraction from sensitive habitats AND Manage the environment to sustainably benefit people and communities This is above the minimum requirement that water companies have to plan for	Enhanced action to protect and improve the environment, with focus on biodiversity and local communities Reduce water abstraction from sensitive habitats AND Enhance the overall level of biodiversity AND Manage the environment to sustainably benefit people and communities This is above the minimum requirement that water companies have to plan for
Reducing carbon emissions *Meet industry target of total net zero carbon (incl. supply chain):*	Achieve carbon emissions reductions target on time (2050) Contribute to reducing climate change by achieving carbon emissions reductions by 2050	Achieve carbon emissions reductions target early (2040) Invest more and sooner to have a greater contribution to reducing climate change by achieving carbon emissions reductions 10 years early			

Attribute	Level 1	Level 2	Level 3	Level 4	Level 5
Reducing leakage from pipes *Meet industry target of 50% leakage reduction:*	Focus on priorities other than reducing leakage No extra investment will be made to reduce leakage from pipes Leaks will be fixed according to a standard programme of infrastructure improvements, reducing from 20% to 15% by 2050 (which is half of the industry target reduction for 2050)	Achieve leakage reduction target on time (2050) Increase investment to reduce the amount of water leakage from pipes in half from 20% to 10% by 2050			
Helping to reduce the amount of water people use *Water use reduction by households:*	No reductions: Maintain current level of water consumption (Average 140 litres per person per day)	Minor reductions: Minimal reduction in the level of water consumption People use approx. 15 litres less each per day through a combination of actions by themselves and services/devices from their water company Could be done by: Fitting an eco-showerhead OR Reducing daily shower length by 2 minutes OR Converting an old style toilet cistern to dual flush OR Turning off tap when brushing teeth	Moderate reductions: Moderate reduction in the level of water consumption People use approx. 30 litres less each per day through a combination of actions by themselves and services/devices from their water company Could be done by: Fitting an eco-showerhead AND doing 1 less washing machine load per week AND 3 less dish washer loads per week OR Converting an old style toilet cistern to dual flush AND reducing daily shower length by 2 minutes	Major reductions: Substantial reduction in the level of water consumption People use approx. 40 litres less each per day through a combination of actions by themselves and services/devices from their water company Could be done by: Fitting an eco-showerhead AND converting an old style toilet cistern to dual flush AND not flushing the toilet every use Reduce daily showers by 2 minutes AND 1 less washing machine load per week AND 3 less dish washer loads per week AND 5 minutes less running the kitchen tap per day	

Section D: Follow-up questions

Following the choice task, respondents were asked a series of follow-ups in which they provided feedback on the ease/difficulty of the exercise plus the aspects they considered most/least, along with some wider attitudinal questions on bill impacts, leakage reduction, and water sharing. These provide information to support the validity testing assessment for the study results in terms of respondent understanding and consistency of preferences or helping to explain choices.

Section E: Respondent profile

The final section of the survey included questions to collect additional information about the respondent. For household respondents this included employment status, income, education, and also questions to identify respondents who might be in vulnerable circumstances. The final question requested general feedback on the survey, including whether it was difficult or not to complete.

2.3 Sampling approach

Sampling quotas for the main survey with overall aim to ensure that the survey results were representative of customers in South West England. The quota criteria for the household customers were gender, age, and socio-economic group (SEG) as reported in Table 2.4Error! Reference source not found.. Quotas for gender and age were specified according to ONS population estimates (2020) and the SEG quotas were based on the 2011 census.

Table 2.4: Sampling quotas – household customers

	Criteria	Quota
Gender [a]	Female	51%
	Male	49%
	Total	**100%**
Age [a]	18-24	9%
	25-30	9%
	31-44	20%
	45-54	16%
	55-64	17%
	65+	28%
	Total	**100%**
SEG [b]	SEG AB	23%
	SEG C1C2	54%
	SEG DE	23%
	Total	**100%**

Source: [a] ONS Population estimates (Mid-2020); [b] ONS Census (2011).

The quota for non-household respondents was specified according to sector (primary, secondary, and tertiary) using ONS Business Activity (2021) data for South West of England (Table 2.5).

Table 2.5: Sampling quotas – non-household customers

	Criteria	Quota
Sector [a]	Primary	9%
	Secondary	20%
	Tertiary	71%
	Total	**100%**

Notes: ONS Business Activity (2021).

3. Household results

Summary of findings

- A representative sample of 1,504 household customers completed the survey. The sample achieved a good geographic spread of respondents across the WCWRG region.
- The majority of respondents had some awareness of the impact that severe water restrictions could have on daily activities. The greatest concern was limiting the availability of water to 2-4 hours per day.
- Respondents supported companies taking actions to protect and improve the environment by reducing the dependency of water supply on surface and groundwater abstractions.
- There was some support for companies to go beyond their current commitments for reducing carbon emissions. More respondents though supported targets for reducing leakage even if this meant higher levels of disruption due to roadworks.
- Respondents also recognised the importance of reducing their own water use but felt that more support could be provided to customers by companies and Government to help achieve this.

3.1 Household customers sample profile

Household customer respondents were recruited via online panel providers. The overall sample size was 1,504 respondents. The average time to complete the survey was approximately 25 minutes (median = 16 minutes). The profile of the sample in terms of water company customers is shown in Figure 3.1. Lower sub-sample sizes for Bristol Water and Bournemouth Water reflect the practical constraints on the online panels for relatively small geographical areas covered by these companies.

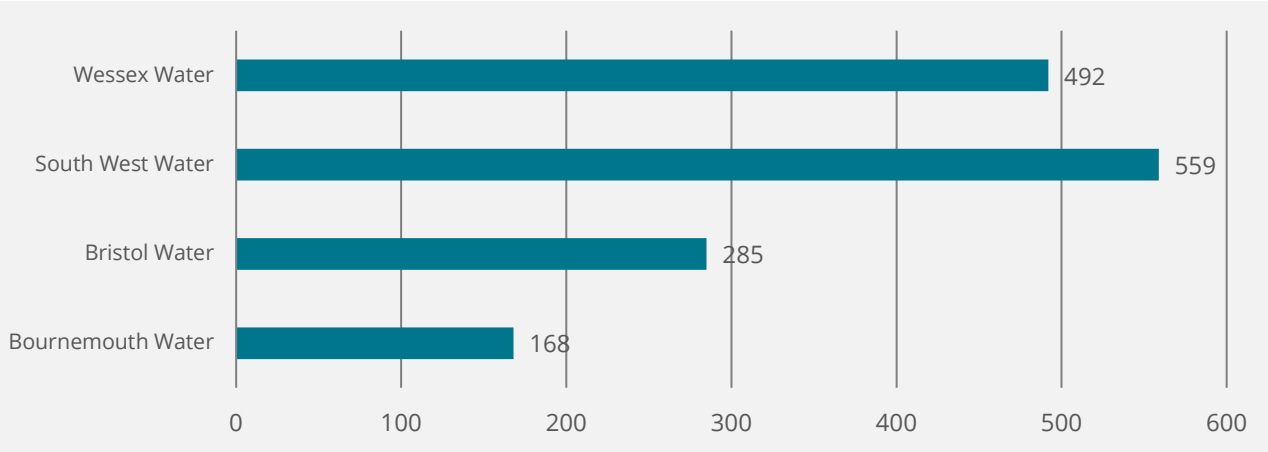


Figure 3.1: Household sample by water company (n = 1,504)

Geographic profile

The geographic distribution of the household sample is shown in Figure 3.2. Overall, there was a good spread of customers across the West Country region. Just under half of the respondents (48%) stated that they lived in a suburban area, followed by rural (27%) and urban (25%) (Figure 3.3).

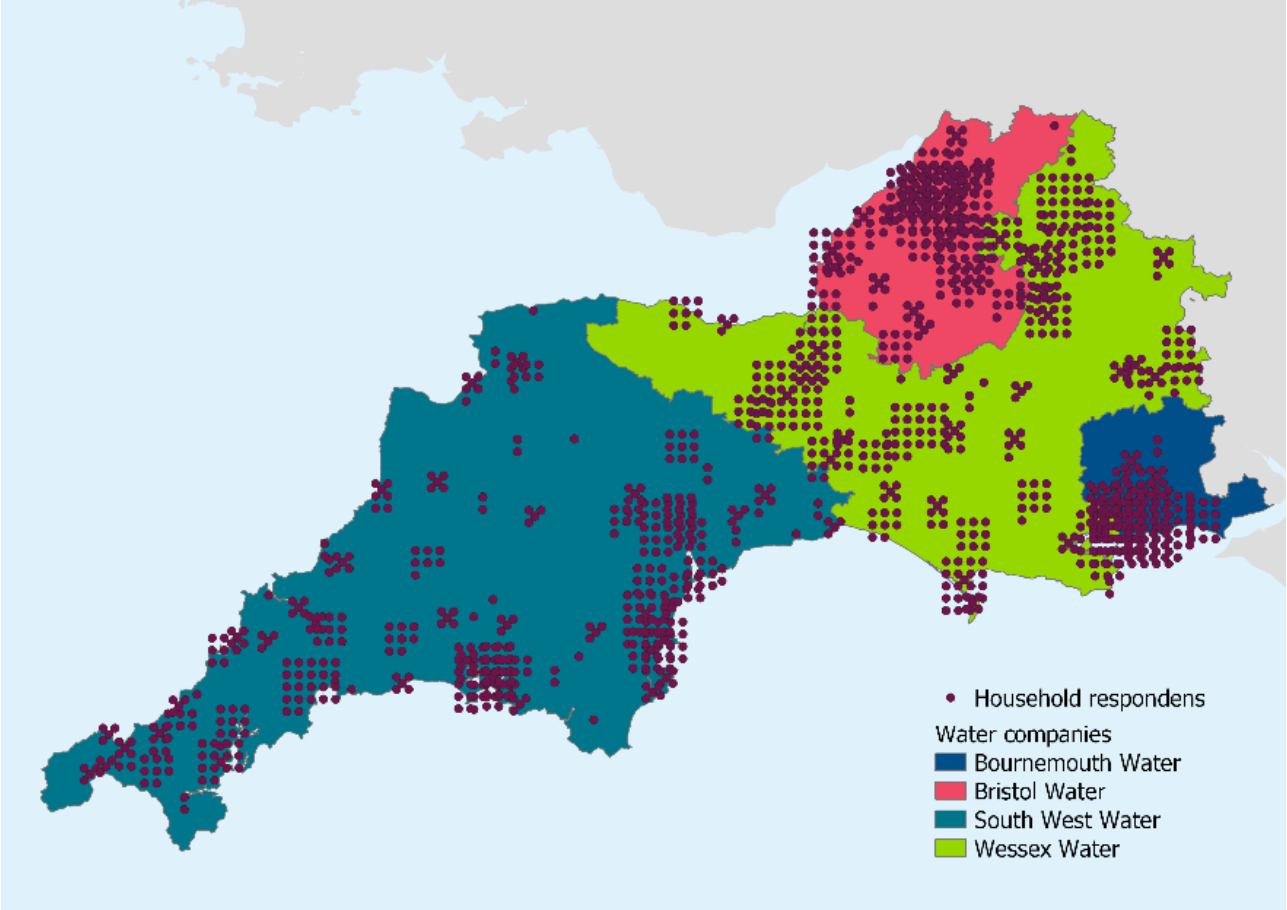


Figure 3.2: Geographic distribution of household sample

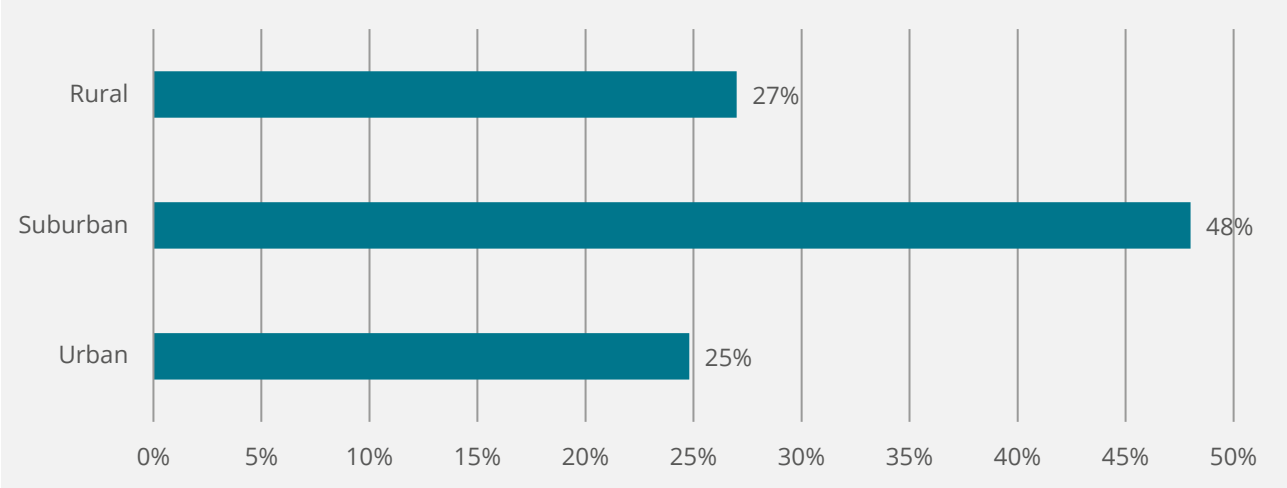


Figure 3.3: Rural vs. urban split (n = 1,501)

Demographic profile

The largest proportion of respondents (51%) stated that they had lived in the South West region for more than 30 years, and two-thirds (66%) of the sample had lived in the region for over 20 years (Figure 3.4). Just under 80% of respondents had lived in the region for least 10 years. A smaller proportion of respondents stated that they lived in the region 5 years or less (15%).

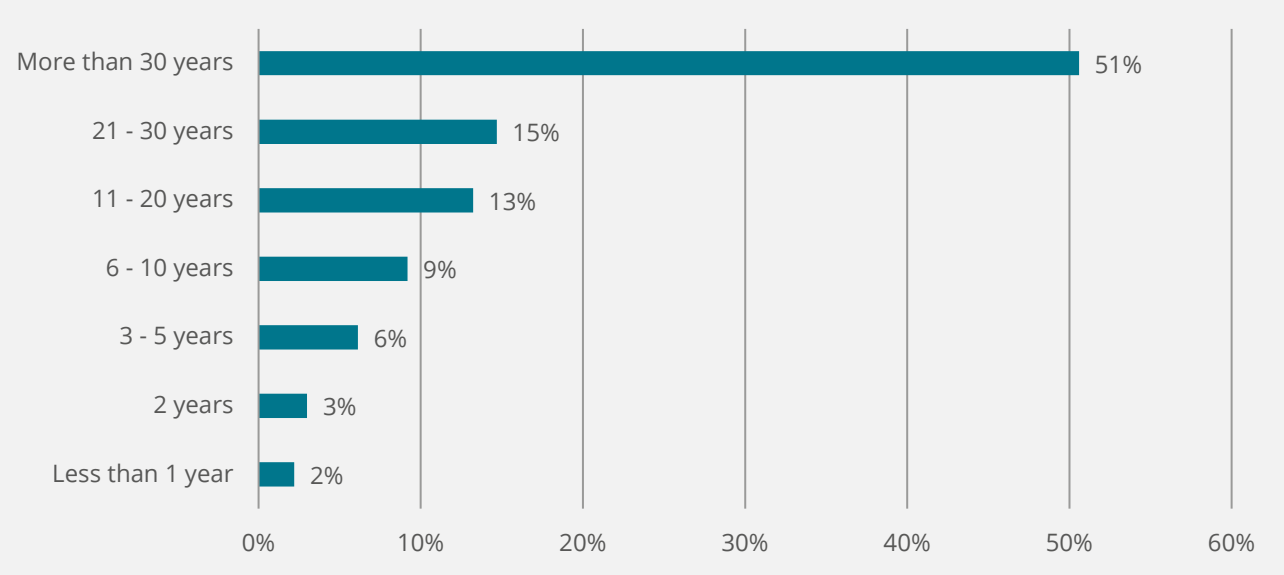


Figure 3.4: Length of residency in the WCWRG region (n = 1,504)

All age cohorts were within +/- 3 percentage points from their respective targets for the household sample, with the exception of respondents aged 18-24 who meet the quota target within +/- 5 percentage points (Figure 3.5).

		n	%
18 - 24		62	4%
	Quota		9%
25 - 34		119	8%
	Quota		9%
35 - 44		340	23%
	Quota		20%
45 - 54		235	16%
	Quota		16%
55 - 64		286	19%
	Quota		17%
65+		462	31%
	Quota		28%
Total		**1504**	

Figure 3.5: Household respondent age profile

The sample is also with +/- 5 percentage points for gender and the split by female versus male respondents (Figure 3.6).

		n	%
Female		840	56%
	Quota		51%
Male		659	44%
	Quota		49%
Total		**1499**	

Figure 3.6: Household respondent gender profile

Responses on household composition showed that the majority of respondents did not have dependents either under 5 years of age (89%) or 5-15 years of age (79%) (Appendix 5). In contrast, 74% of respondents lived with at least 1 person aged 16-64, compared to only about 39% who lived with somebody aged 65 or over.

Socio-economic profile

The sample profile was within 1 percentage point of the specified quota for SEG DE respondents, SEG AB and SEG C1C2 were within 9 percentage points (Figure 3.7). Sample weights are applied in the main analysis (Section 5) to control for over/under representation of SEG AB and SEG C1C2 respondents.

		n	%
AB		474	32%
	Quota		23%
C1C2		672	45%
	Quota		54%
DE		358	24%
	Quota		23%
Total		**1504**	

Figure 3.7: Household respondent SEG profile

Sample average gross income was approximately £2,500 per month (approx. £30,500 per year). The highest proportion of respondents (14%) reported gross income in the range of £1,601 - £2,166 per month (approx. £19,200 - £26,000 per year). Around a quarter of the sample reported gross income less than £19,200 per year (Figure 3.8).

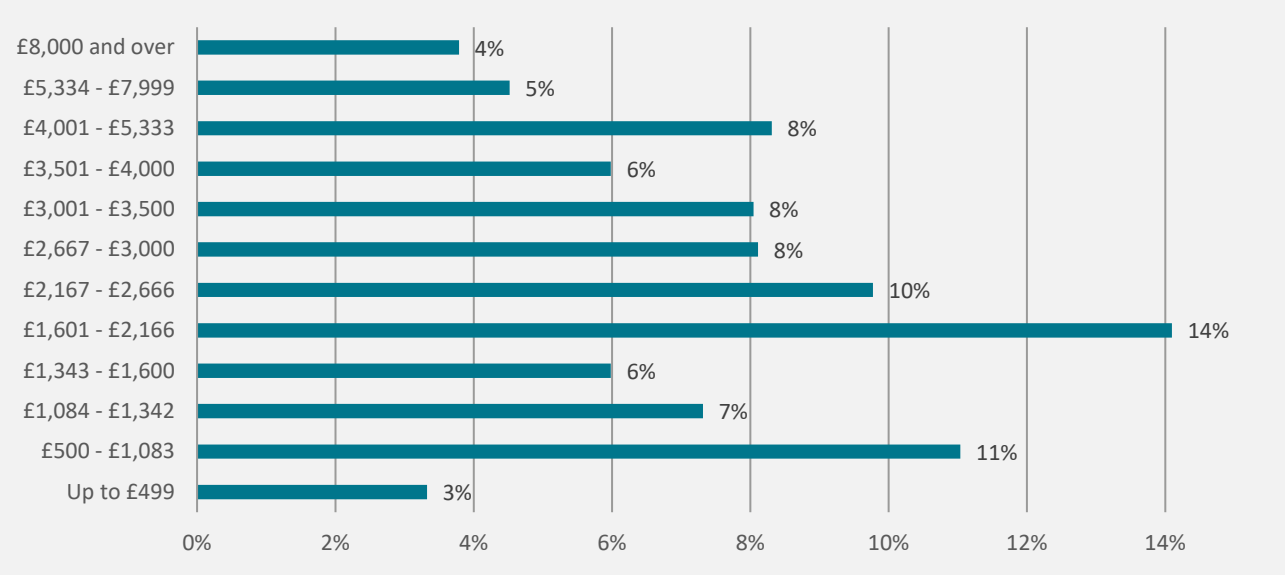


Figure 3.8: Household respondent income profile (gross per month) (n = 1,358)

Customer circumstances

The household version of the survey included a set of questions to identify respondents that might be in potentially vulnerable circumstances. Relatively few respondents reported that either they or a household member had certain medical conditions (on average >20%) or was an unpaid carer (14%). A larger proportion of respondent household included at least one member of pensionable age (39%).

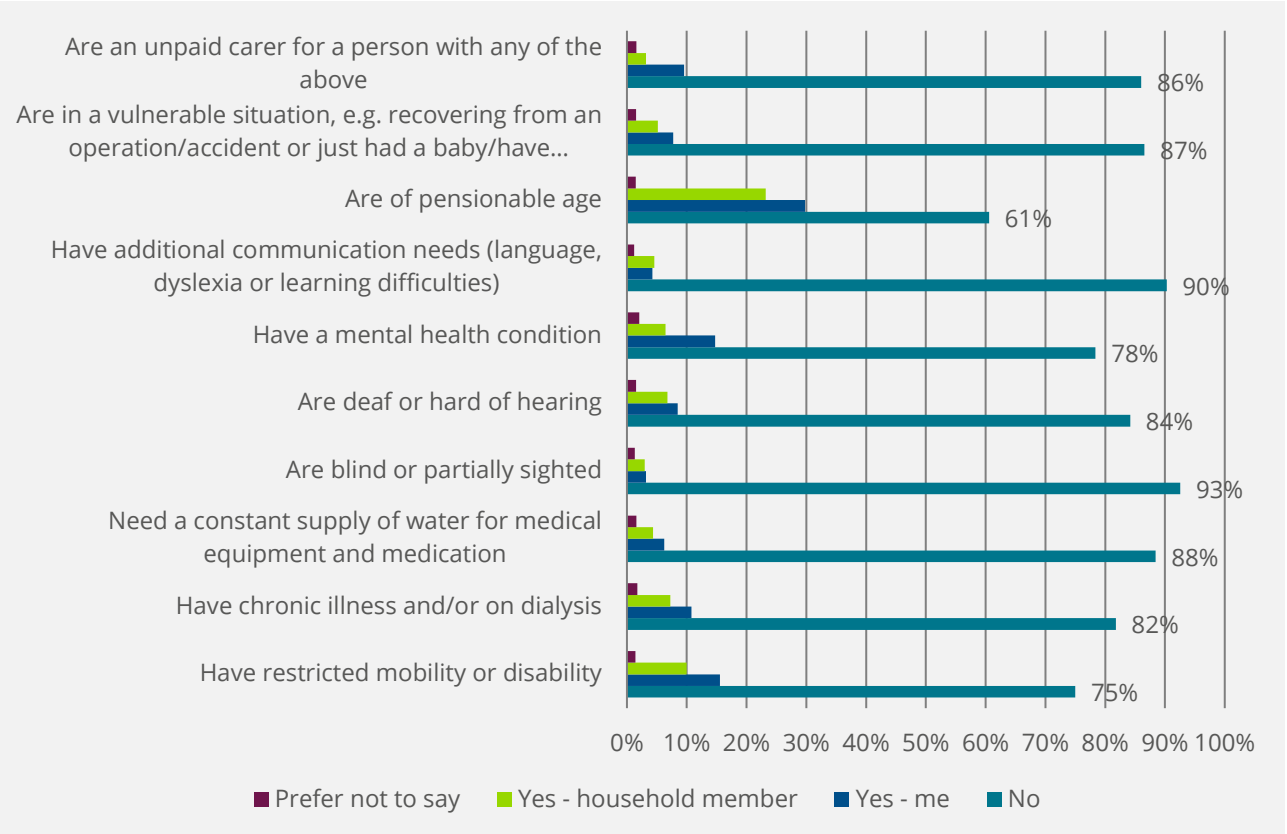


Figure 3.9: Customer household circumstances (n = 1,504)

Overall, 241 respondents (16%) stated that they were registered with the Priority Service Register (PRS). The majority of these were registered for reasons related to dependency on water services (Figure 3.10).

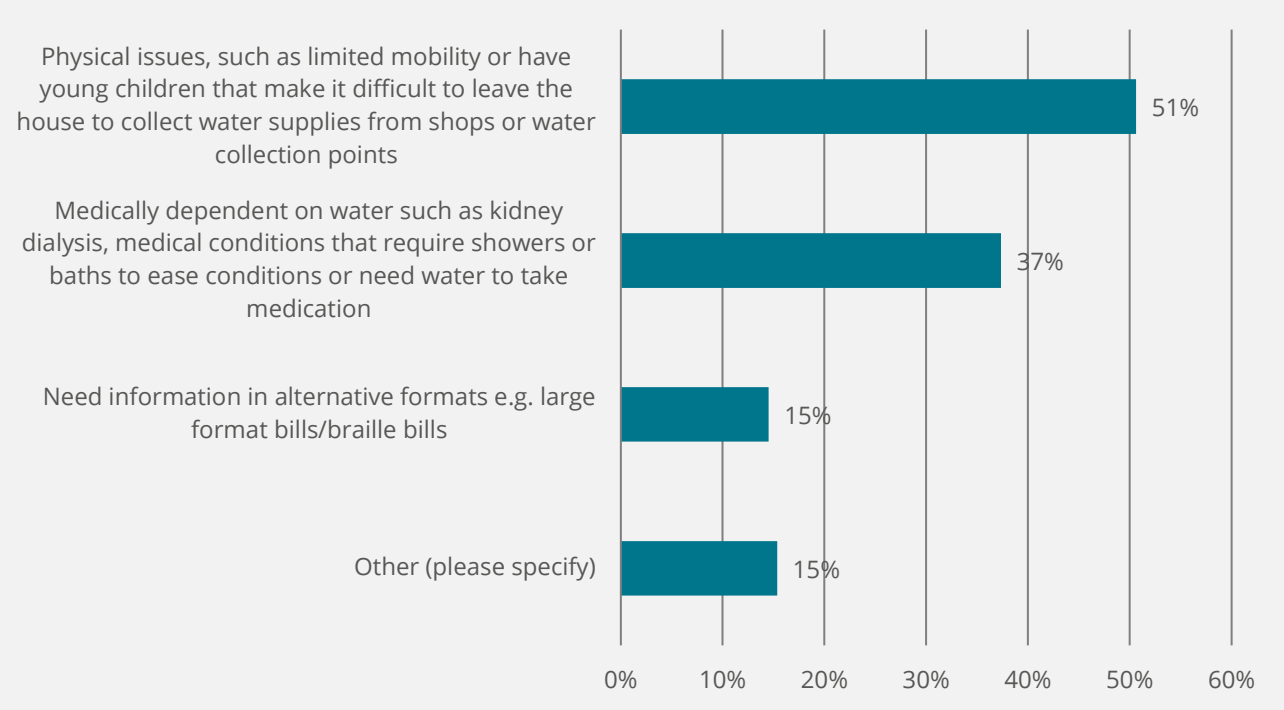


Figure 3.10: Reasons for being registered with the Priority Services Register (n = 241)

Around one-in-five respondents stated that they encountered difficultly with the affordability of their water bill (either "sometimes" or "always" find it difficult to pay bill) (Figure 3.11). A significant proportion of respondents also stated that their household's financial position had worsened in the past 12-months (33%) and/or that they expected it to get worse in the next 12 months (37%) (Figure 3.12).

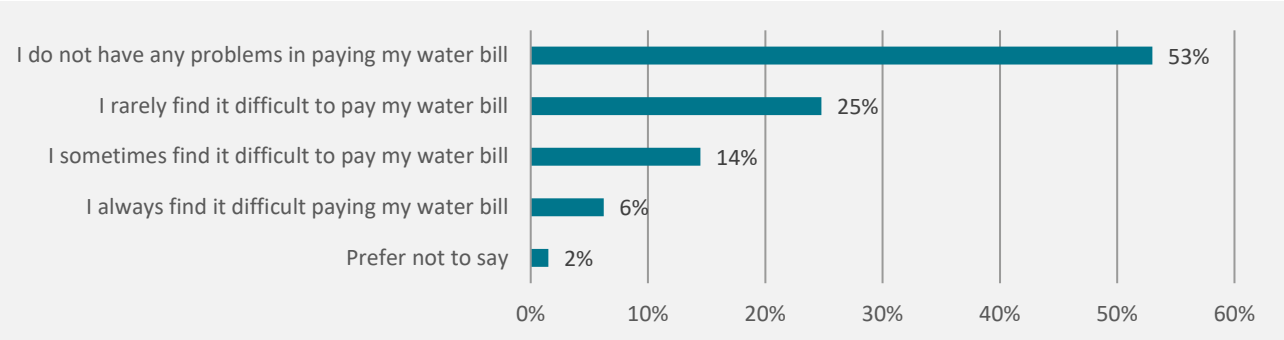


Figure 3.11: Difficulty paying water bill (n = 1,396)

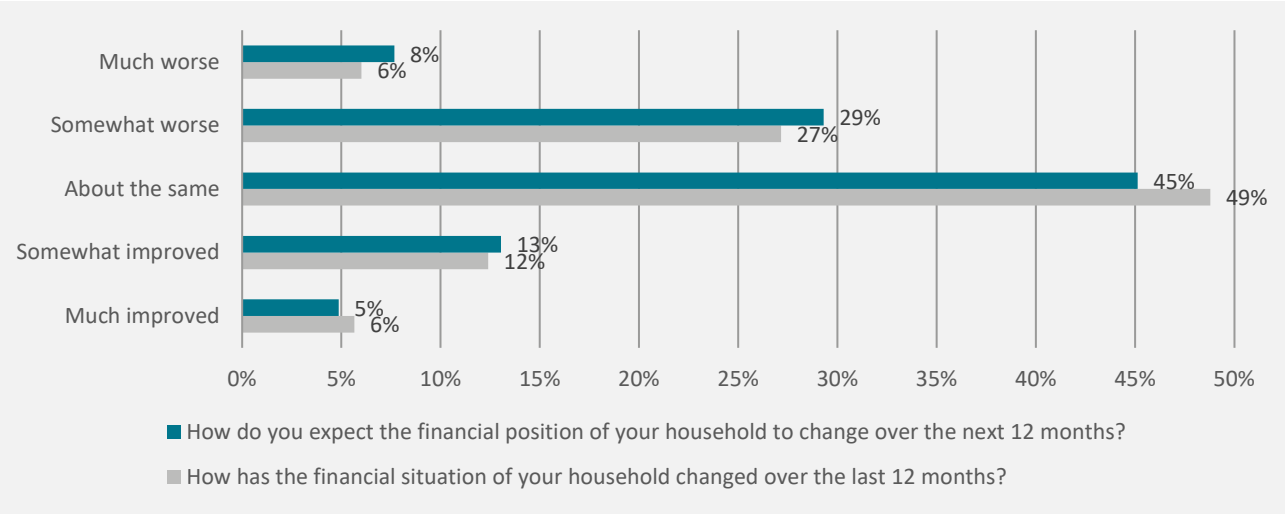


Figure 3.12: Change in financial position (n = 1,396)

3.2 Household customer views on regional planning

Impact of severe water use restrictions

Respondents had a reasonable level of awareness of the disruption that severe water use restrictions would have on day-to-day life, with the majority stating "somewhat" or "very aware" (72%). In contrast, just over a quarter of respondents stated that they were "not at all" aware (26%) (Appendix 5). The greatest concern about the impact of restrictions was the limited availability of running water (2-4 hours per day), with 50% of respondents stating that this would impact their household "a lot" and further 36% stating "somewhat" (Figure 3.13). Lower pressure and using less water for activities such as showering were also perceived to have a significant impact, with over 70% of the sample stating either "a lot" or "somewhat" for each case. Overall lower levels of concern were stated for closure of schools and/or public transport, although this may reflect the sample profile in terms of the main impact being on specific groups of customers rather than across the board.

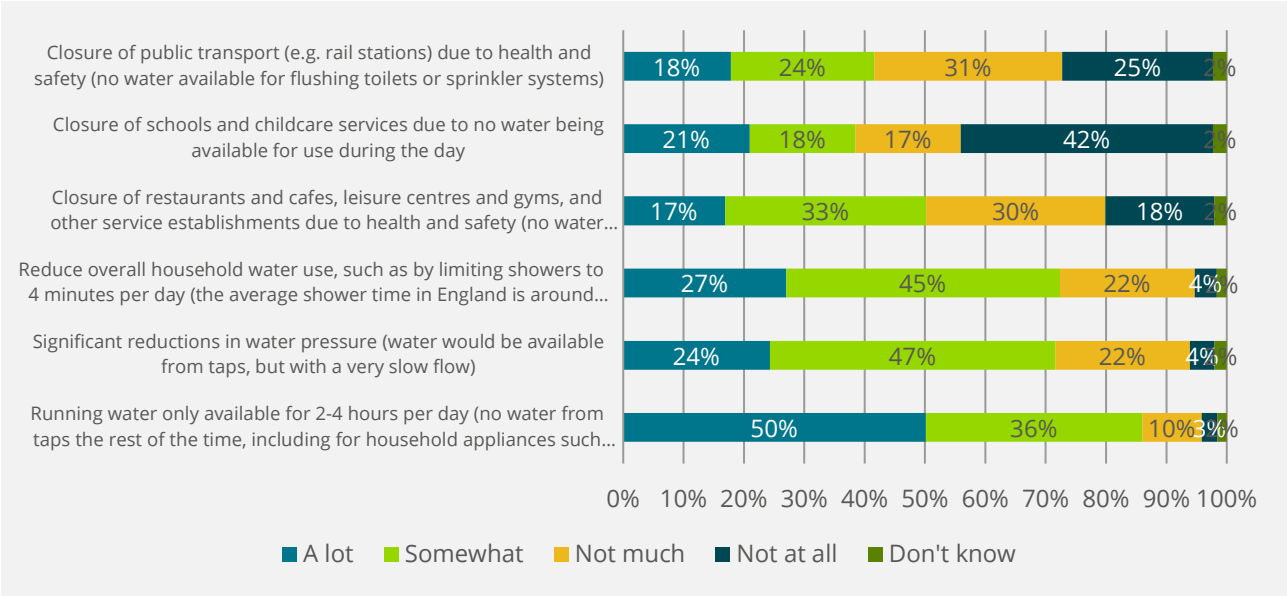


Figure 3.13: Impact of severe water use restrictions (n = 1,504)

Protecting and improving the environment

Most respondents had a positive view of measures to protect and improve the environment, with 84% agreeing that they would be happy to reduce their water usage (either "strongly agree" or "agree") (Figure 3.14). A large majority also supported the development of storage options such as reservoirs as a way to protect the environment and ensure resilience to drought (82% either "strongly agree" or "agree"). There was also overall agree that fixing leaks in the water supply network is the best way to reduce the amount of water taken from the environment (76% either "strongly agree" or "agree").

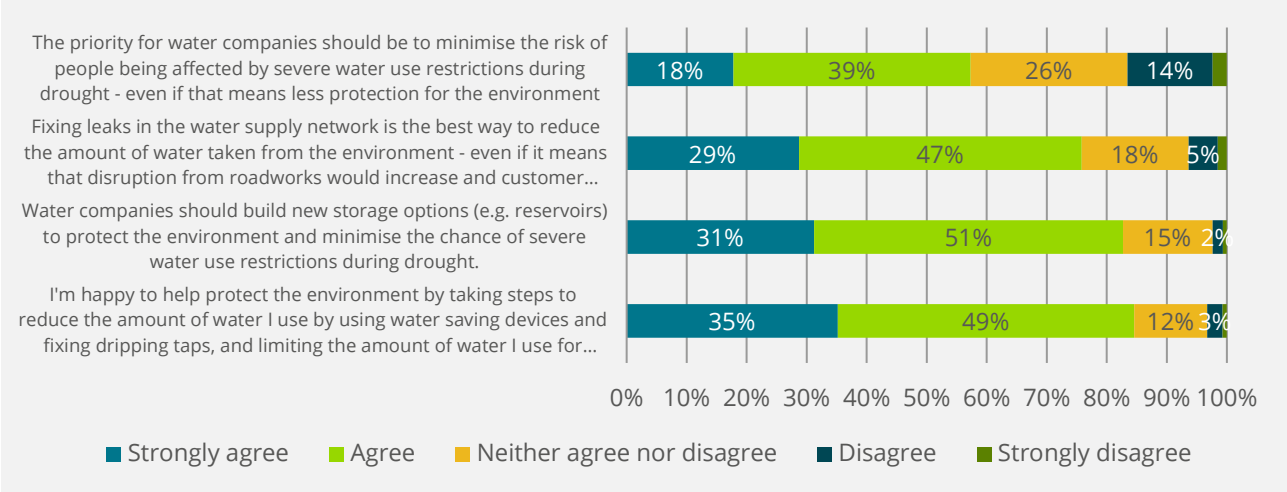


Figure 3.14: Attitudes towards environmental protection and improvements (n = 1,504)

Reducing carbon

Views on whether companies should go beyond current commitments and invest in reducing their carbon emissions faster than current plans were mixed (Figure 3.15). The largest proportion of respondents were in agreement (32%) but felt that carbon was not the only issue that companies should be addressing. A similar proportion of respondents were undecided, with the view that their support would depend on the amount of investment required and what else the money could be spent on (29%).

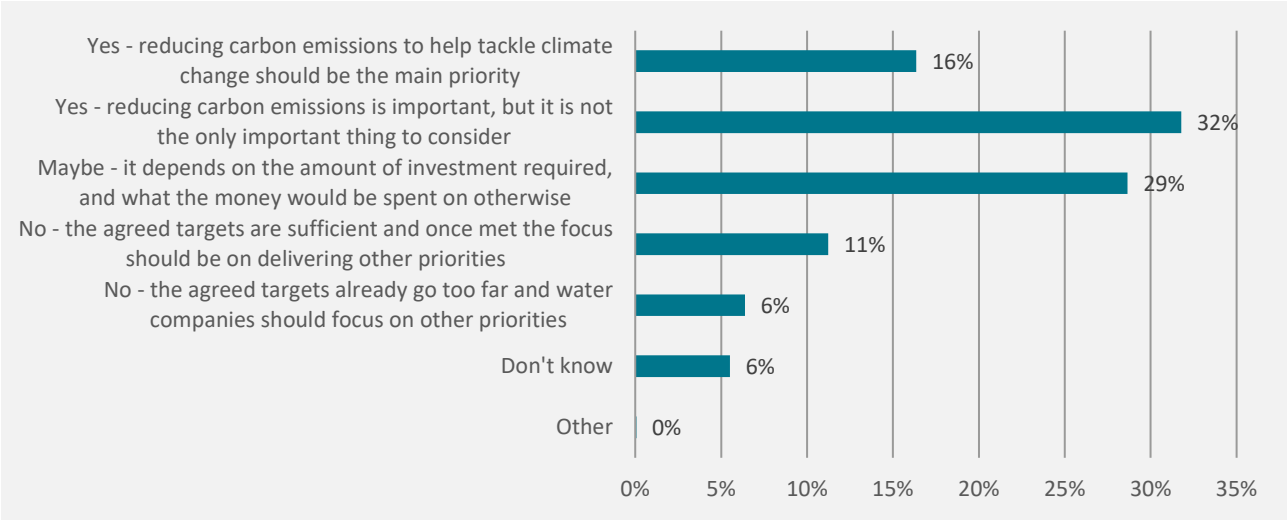


Figure 3.15: Views on reducing carbon emissions faster than current commitments (n = 1,504)

Reducing leaks

Reducing leakage was important to respondents with 82% supporting repair or replacement even if this meant disruption for local communities (either "strongly agree" or "agree") (Figure 3.16). There was also a strong view that level of leaks should be minimised regardless of the cost (76% "strongly agree" or "agree").

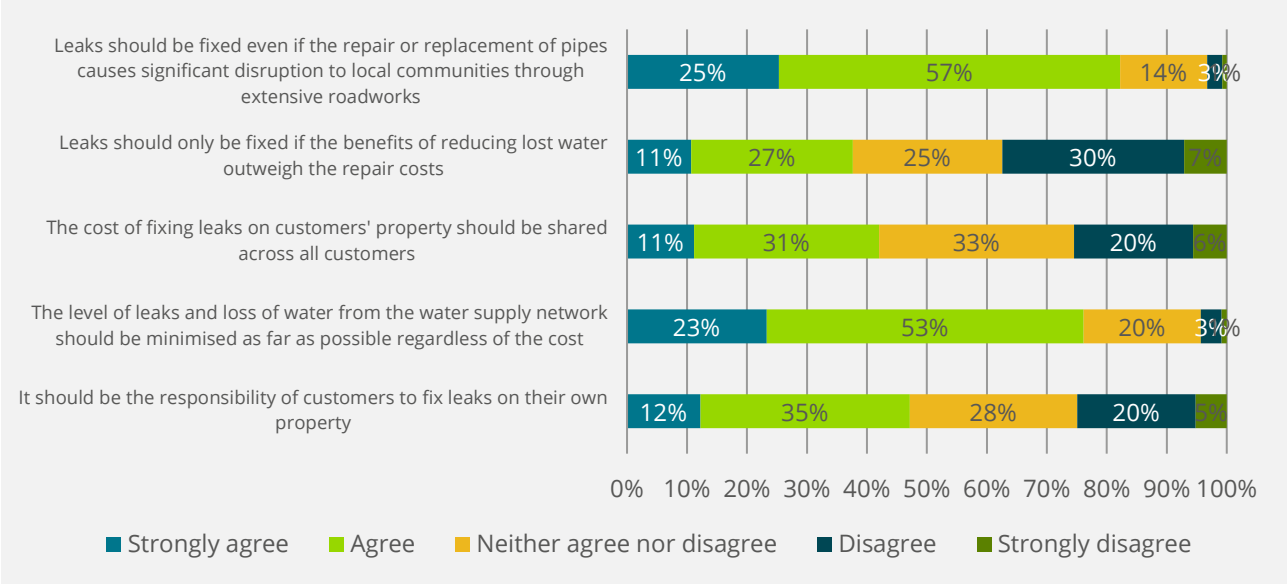


Figure 3.16: Attitude towards leakage reduction (n = 1,504)

Responses to a follow-up about the impact of works to reduce leaks (repair or replacement) showed that the greatest concern would be the requirement for households to fix leaking pipes on their property and the associated costs. The majority of respondents (64%) stated that this would bother them (either "a lot" or "somewhat"), followed by the impact that replacing pipes would have on traffic and local disruption (48% "a lot" or "somewhat") (Figure 3.17). The lowest level of concern was for disruption to local businesses due to blocked access or parking (48% "a lot" or "somewhat").

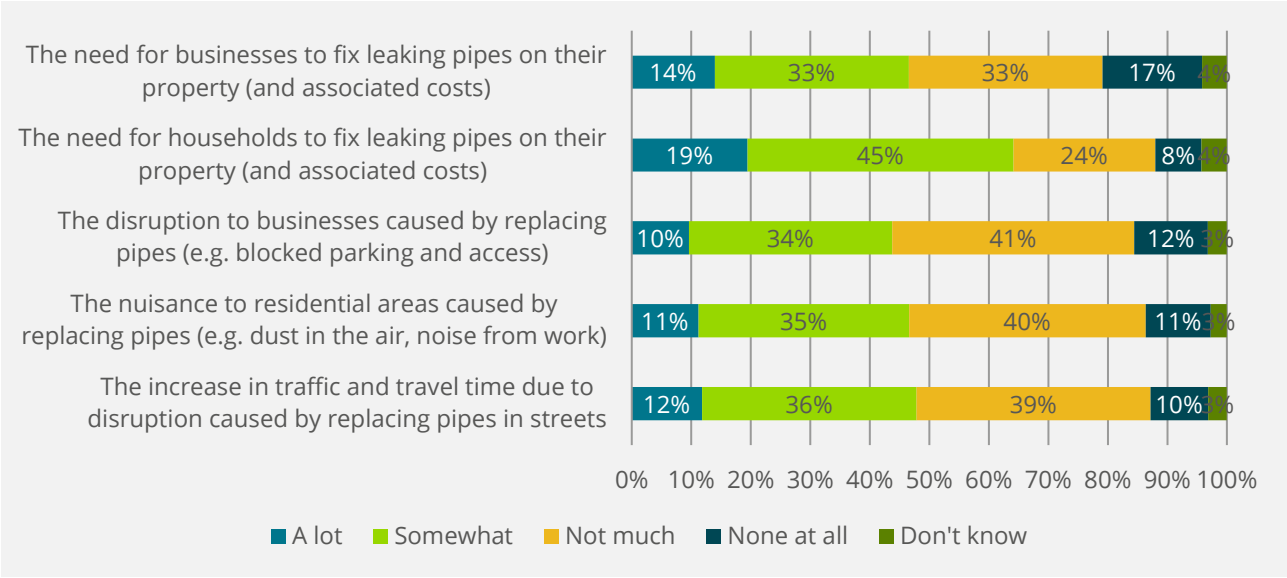


Figure 3.17: Level of concern about impacts of repair works to reduce leakage (n = 1,504)

Reducing per capita consumption

There was a high level of agreement overall that everyone should play a part in reducing water use (87% "strongly agree" or "agree") and that building standards for new buildings should require more water efficiency (86% "strongly agree" or "agree") (Figure 3.18). There was also a strong view that Government and water companies should support households in using less water, either through water saving devices or incentives (81% "strongly agree" or "agree"), particularly with the majority of respondents feeling that they were already doing as much as they could to save water (66% "strongly agree" or "agree"). Support for an explicit target for household water use was, though, limited (44% "strongly agree" or "agree"), with a sizeable proportion of respondents equivocal (30% "neither agree nor disagree").

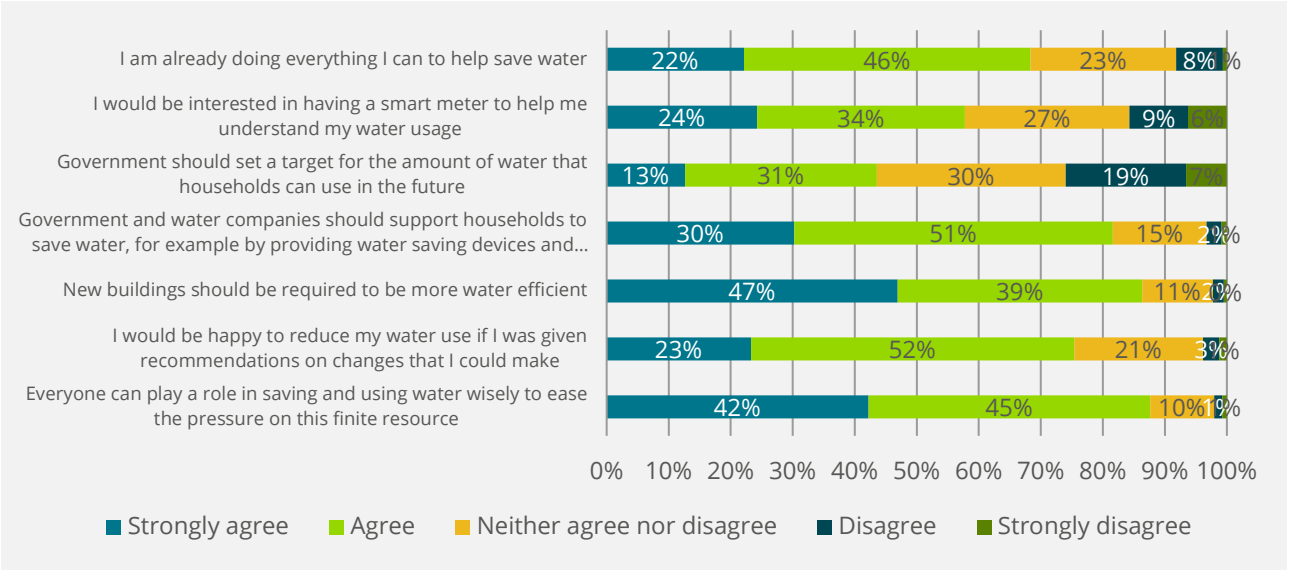


Figure 3.18: Attitudes towards reducing water use (n = 1,504)

Sharing water

There was a good level of support for sharing water resources across the country if a region has an excess supply (81% "strongly agree" or "agree") (Figure 3.19). More broadly, 73% of respondents agreed with water sharing in principle (either "strongly agree" or "agree"). The majority of respondents were also wary of transfers if it meant a region would be dependent on supply from elsewhere ("no area should be dependent – 56% "strongly agree" or "agree"). There was not, though, over-riding support for intra-region transfers over inter-region transfers ("it's ok to share within a region but not across the whole country – 42% "strongly agree" or "agree").

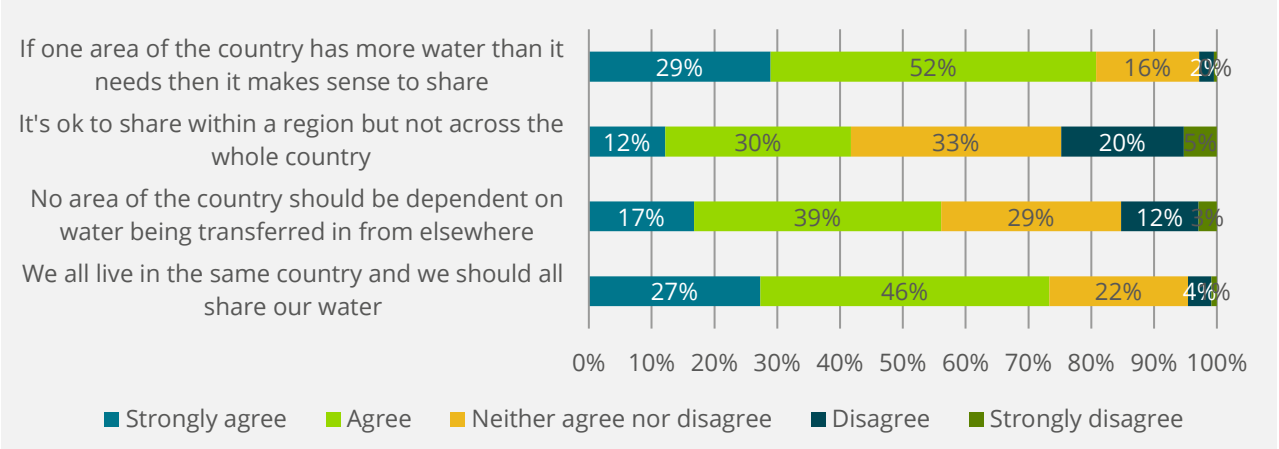


Figure 3.19: Attitudes towards sharing water resources (n = 1,504)

The greatest concern for household respondents regarding transfers was maintaining the aesthetic quality of water supply (e.g. switching sources), with 35% stating that maintaining taste, appearance, hardness etc. was the most important consideration. Overall, there was little distinction in the importance of other considerations - such as leakage and water saving levels by recipients and impact on risk of severe water use restrictions being needed - with relatively equal shares across the ranking from most important to least important.

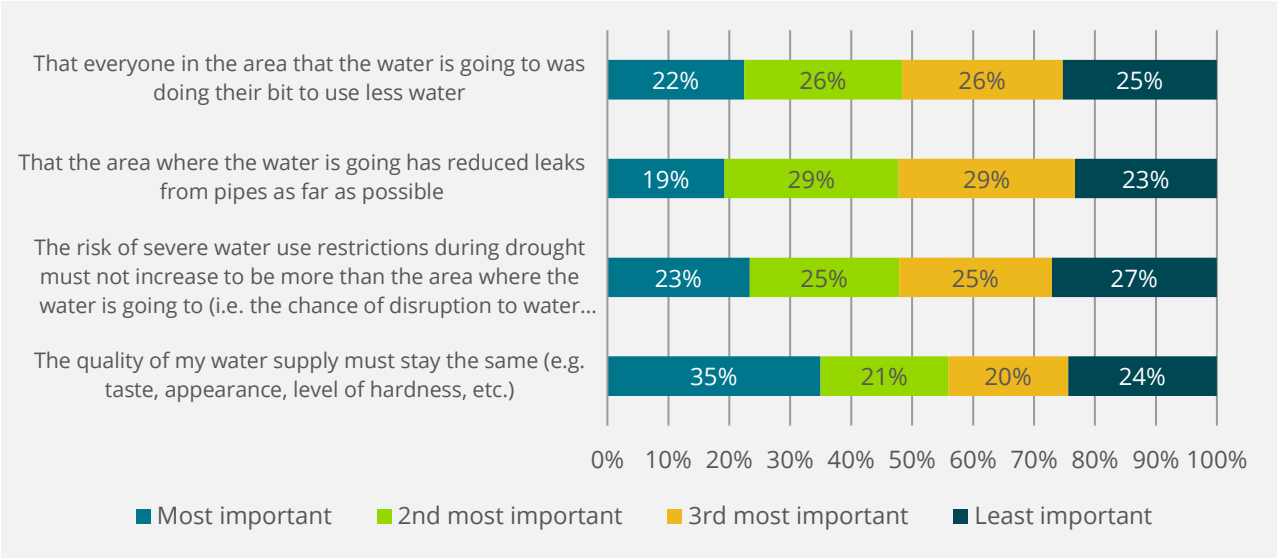


Figure 3.20: Key considerations for sharing water resources (n = 1,504)

4. Non-household results

Summary of findings

- A representative sample of 304 non-household respondents completed the survey. For the most part, the views of non-household respondents are similar to the household sample.
- There was a high level of awareness of the impact that severe water restrictions could have on organisations. As with household respondents, the greatest concern was limiting the availability of water to 2-4 hours per day. Other disruption would also be keenly felt, including reducing uses of water and closure of public transport, schools, and certain businesses.
- There was a positive view on measures to protect and improve the environment by reducing the dependency of water supply on surface and groundwater abstractions.
- There was support for companies to go beyond their current commitments for reducing carbon emissions, but more respondents felt that this had to be balanced with other investment needs rather than it being the main priority for companies. Most respondents supported targets for reducing leakage even if this meant higher levels of disruption from roadworks.
- Non-household respondents had a higher level of support an explicit target on water use (PCC) compared to the household sample.

4.1 Non-household customers sample profile

The non-household sample included 304 respondents who were recruited via online panel providers. The average time it took non-household respondents to complete the survey was 13 minutes. The sample sizes by company are provided in Figure 4.1. The smaller sample sizes for Bristol Water and Bournemouth Water reflect the recruitment constraint for online panels due to a relatively small areas in which the respective company operates. The highest proportion of respondents was for South West Water (43%), followed by Wessex Water (27%).

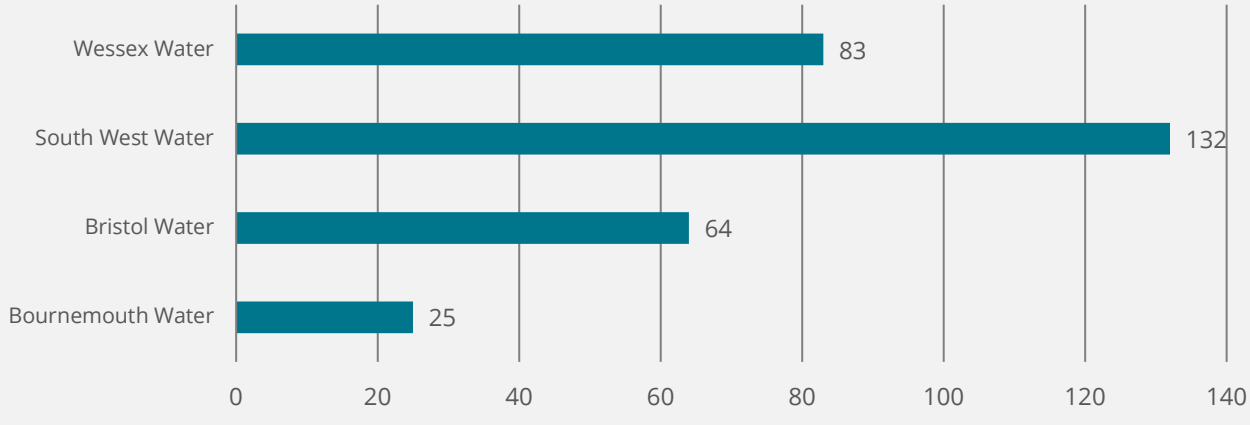


Figure 4.1: Non-household sample by water company (n = 304)

Geographic profile

Figure 4.2 shows the distribution of non-household customers in the West Country. Overall, there was a good distribution of WCWRG customers across the region, given the respective sample sizes.

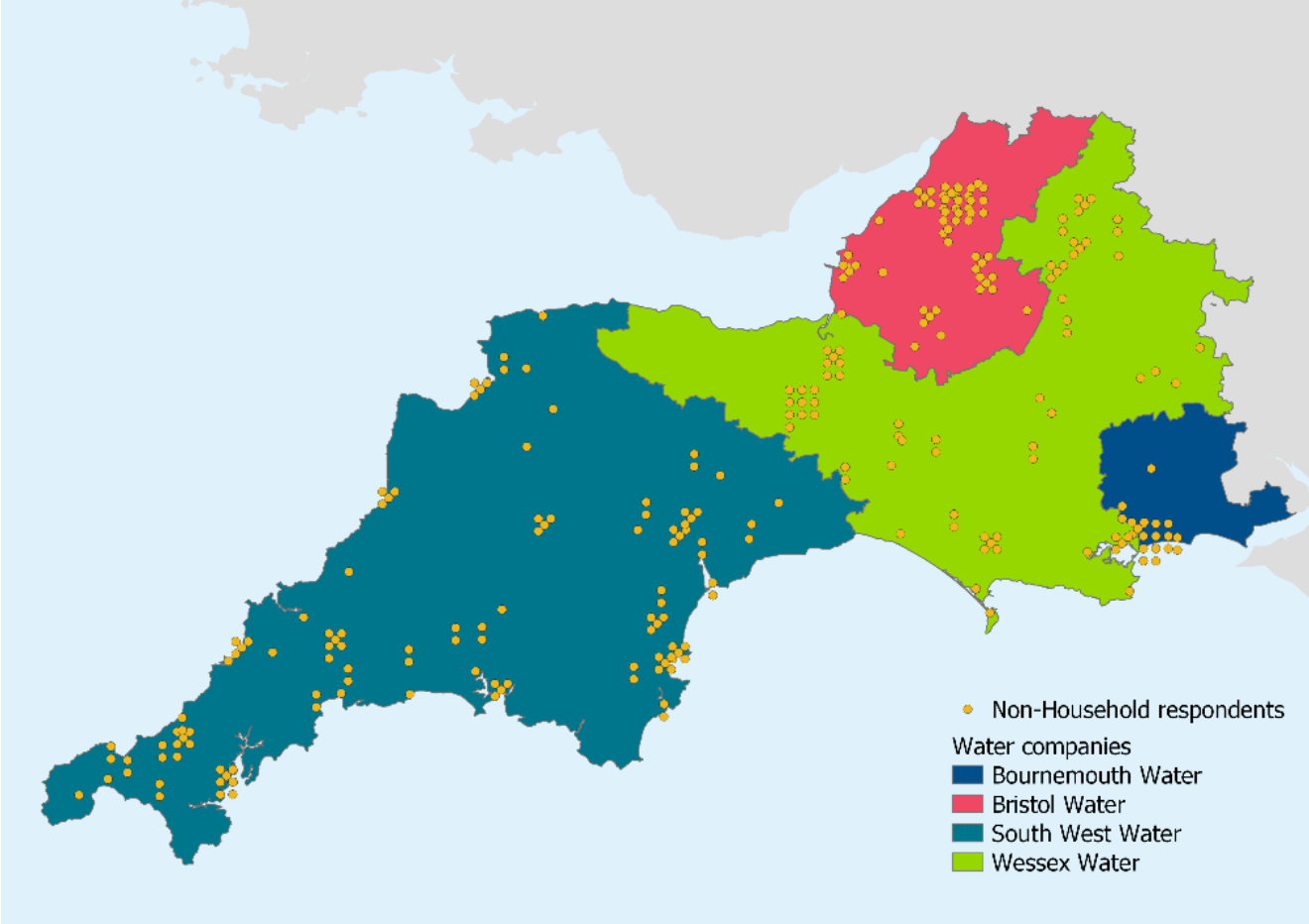


Figure 4.2: Geographic distribution of non-household sample

Activity

Non-household respondents provided information on the activity and the sector in which they operate (Figure 4.3; Figure 4.4). Just over three-quarters of respondents were involved in tertiary sector activities (77%). Lower representation of secondary sector activities (20%) and primary sector activities is consistent with the economic profile for the WCWRG region. The achieved samples are within +/- 6 percentage points of the respective target quotas.

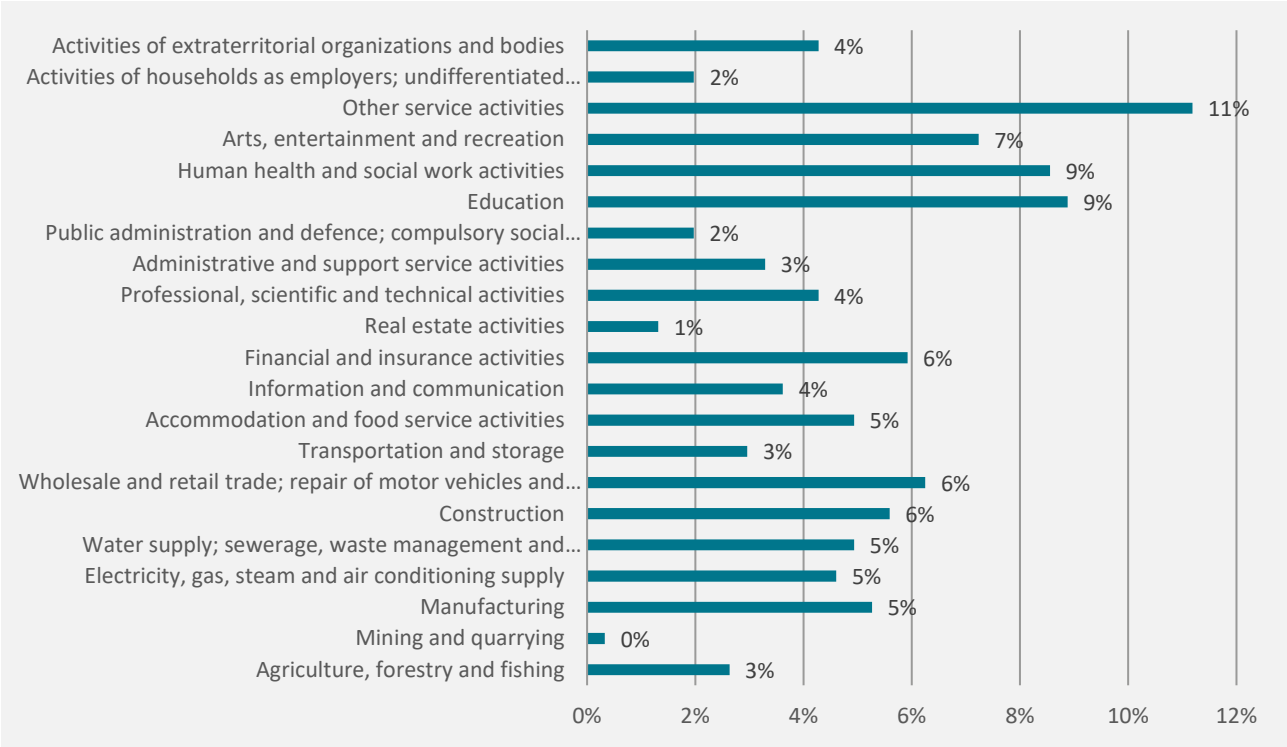


Figure 4.3: Non-household organisation activity (n = 304)

	n	%
Primary	9	3%
Quota		9%
Secondary	62	20%
Quota		20%
Tertiary	233	77%
Quota		71%
Total	**304**	

Figure 4.4: Non-household respondent sector (n = 304)

Organisation size

The non-household sample had a good spread across size of organisations sizes. In terms of number of employees, there was a fairly even representation of small organisations (0-9 employees) through to larger organisations (more than 250 employees) (Figure 4.5). The greatest proportion of respondents operated from a single site (43%) (Figure 4.6). The majority of respondents reported annual turnover below £500,000 (54%) (Figure 4.7). Median reported turnover for the sample was approximately £407,000 per year.

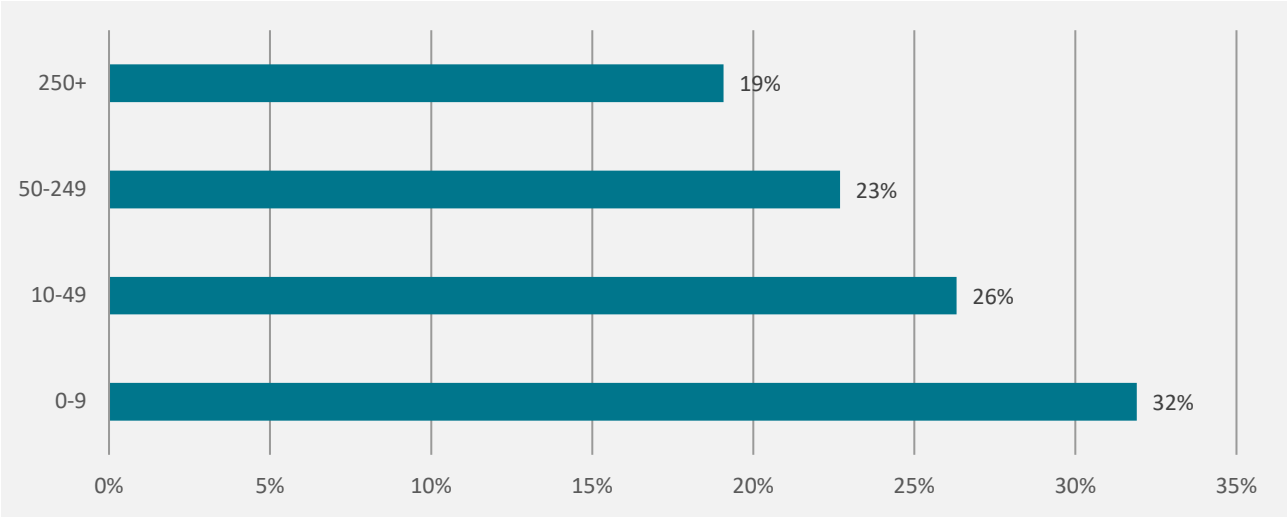


Figure 4.5: Number of employees (n = 304)

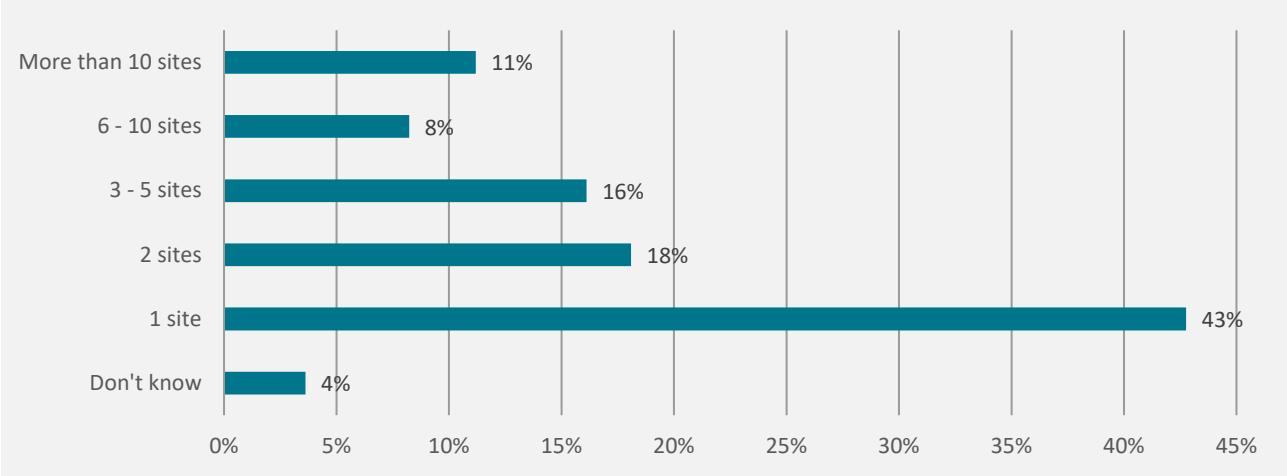


Figure 4.6: Number of sites (n = 304)

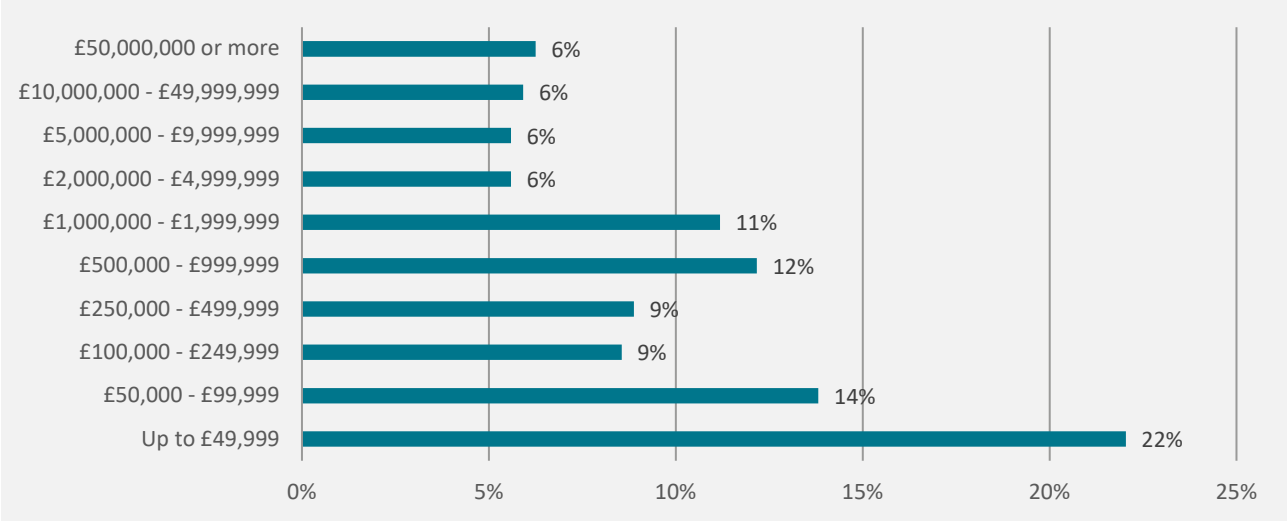


Figure 4.7: Annual turnover (n = 304)

4.2 Non-Household customer views on regional planning

Impact of severe water use restrictions

Awareness of the level of disruption caused by water restrictions was high. The majority of the respondents were aware ("somewhat aware" or "very aware") of the level of disruption that would occur (81%) (Appendix 5). Similar to household respondents, the greatest concern about the impact of restrictions was the limited availability of running water (2-4 hours per day) (80% "a lot" or "somewhat") (Figure 4.8). Most of the sample also felt that reducing domestic uses of water (72% "a lot" or "somewhat") and closure of public transport (64% "a lot" or "somewhat") and of schools and childcare services (65% "a lot" or "somewhat") would also affect their organisations, as too closure of certain businesses (66% "a lot" or "somewhat").

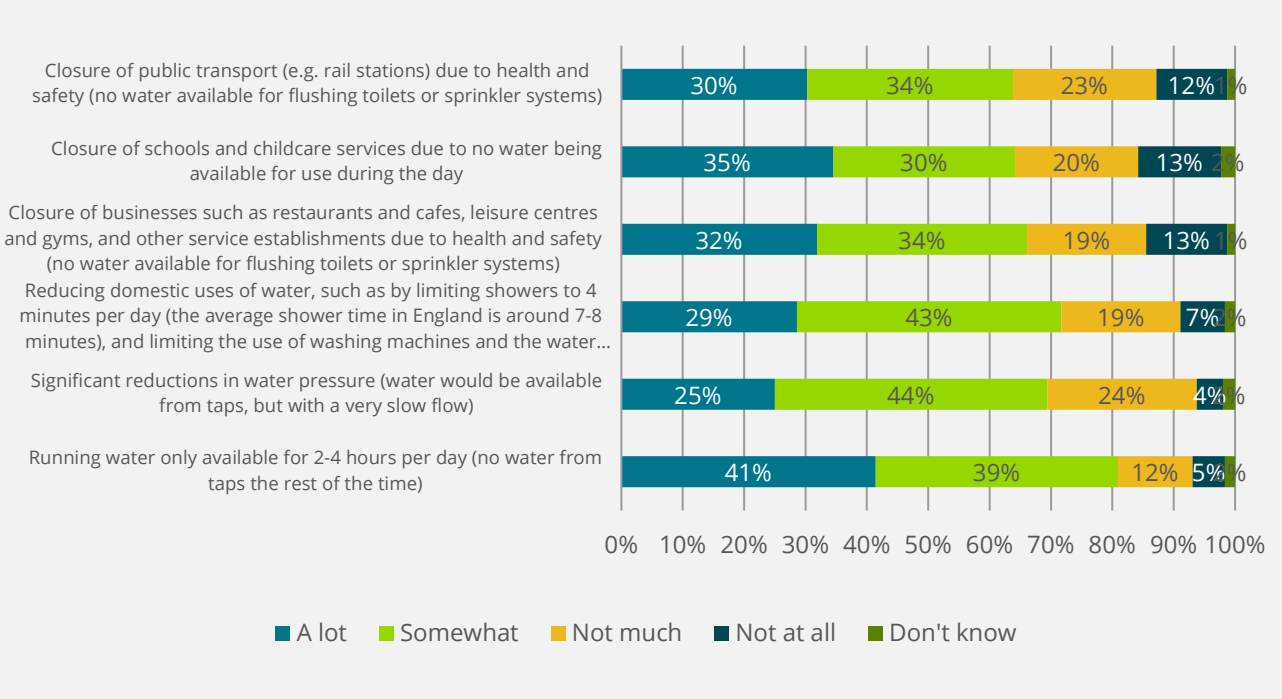


Figure 4.8: Impact of severe water use restrictions (n = 304)

Protecting and improving the environment

Non-household respondents had a positive view on measures to protect and improve the environment and, overall, their responses were very consistent with those of the household sample (Figure 4.9). There was a strong feeling that their organisations could take steps to save water that would contribute to environmental protection (88% "strongly agree" or "agree"). There was also a high level of support for new storage options such as reservoirs as a way to protect the environment and ensure resilience to drought (82% either "strongly agree" or "agree"). Similarly, there was a high level of agreement that fixing leaks in the water supply network is the best way to reduce the amount of water taken from the environment (79% either "strongly agree" or "agree").

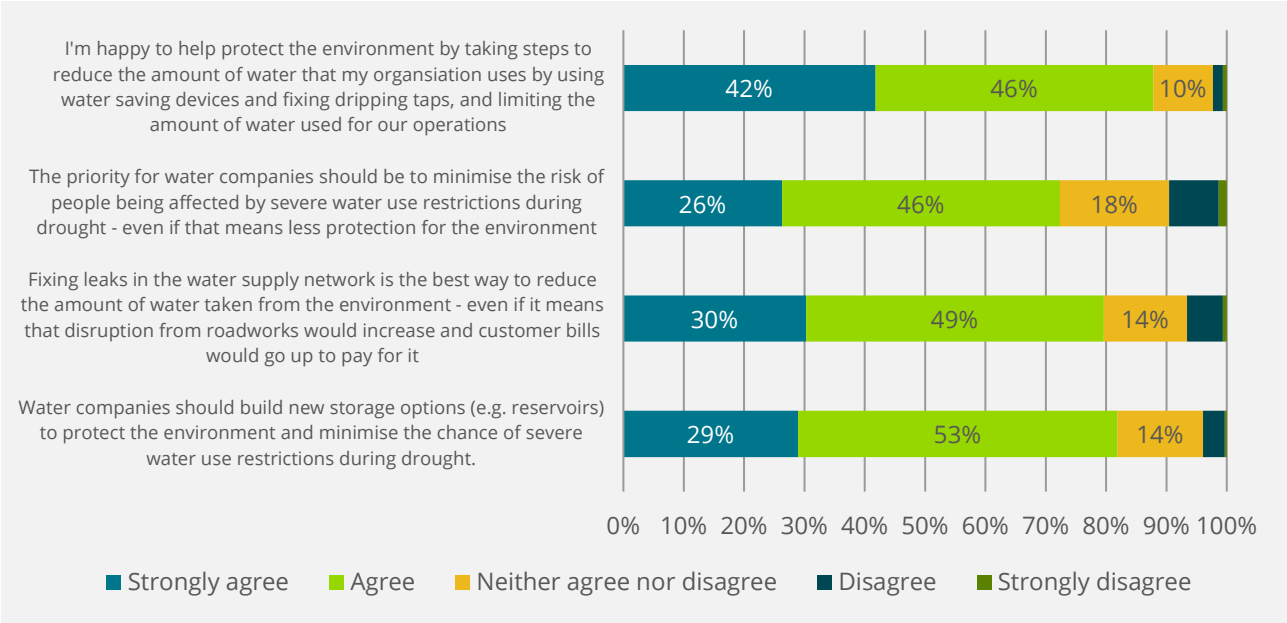


Figure 4.9: Attitudes towards environmental protection and improvements (n = 304)

Reducing carbon

The largest proportion of non-household respondents recognised the importance of reducing carbon emissions faster than current commitments but noted it was one of several important issues to consider (40%) (Figure 4.10). A significant proportion, though, felt that reducing emissions faster should be the main priority (29%). Fewer felt that current targets were sufficient (2%) or that they were detracting from delivering on other priorities (6%).

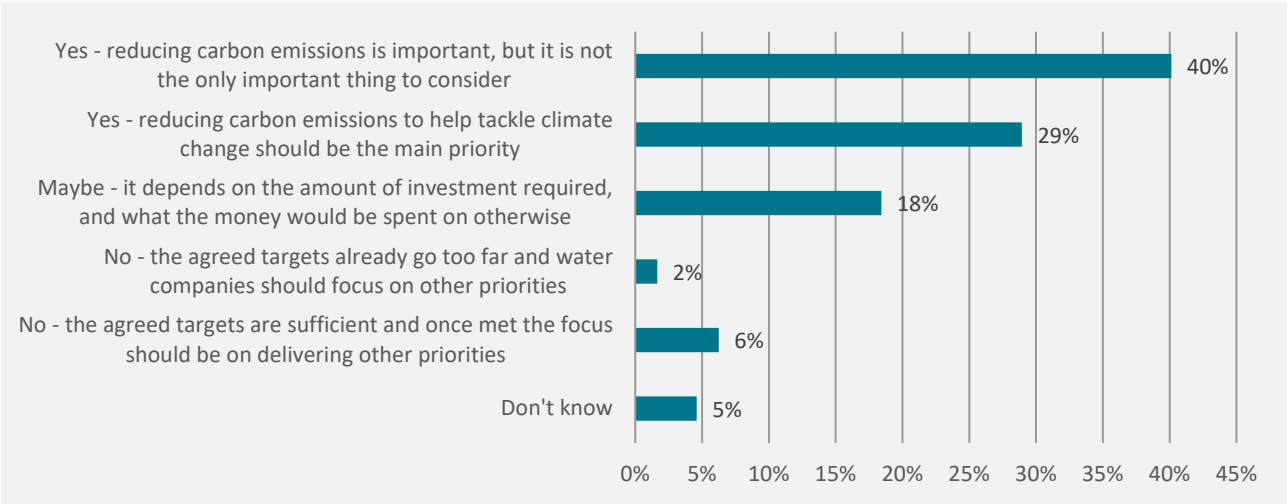


Figure 4.10: Views on reducing carbon emissions faster than current commitments (n = 304)

Reducing leaks

As with household responses, non-household respondents repair or replacement of pipes to reduce leakage even if this meant significant disruption to local communities through extensive roadworks (78% "strongly agree" or "agree") (Figure 4.11). There was also a strong view that level of leaks should be minimised regardless of the cost (78% "strongly agree" or "agree"), although just under of half of respondents also agreed that leaks should only be fixed if the benefits of doing so outweigh the costs (49%).

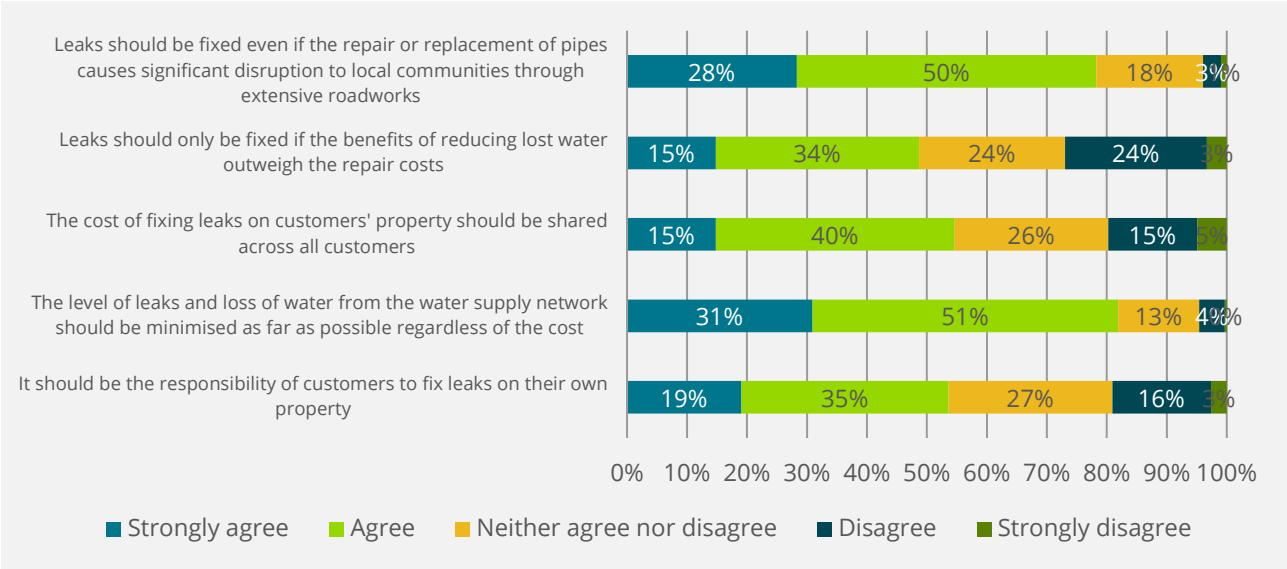


Figure 4.11: Attitudes towards leakage reduction (n = 304)

Although non-household respondents were supportive of actions to reduce leaks, follow-up questions also showed that organisation would have some concerns about possible disruption (Figure 4.12). In all examples listed, more 60% of respondents indicated that would either be bother "a lot" or "somewhat" (fixing own leaks, blocked access, nuisance, traffic).

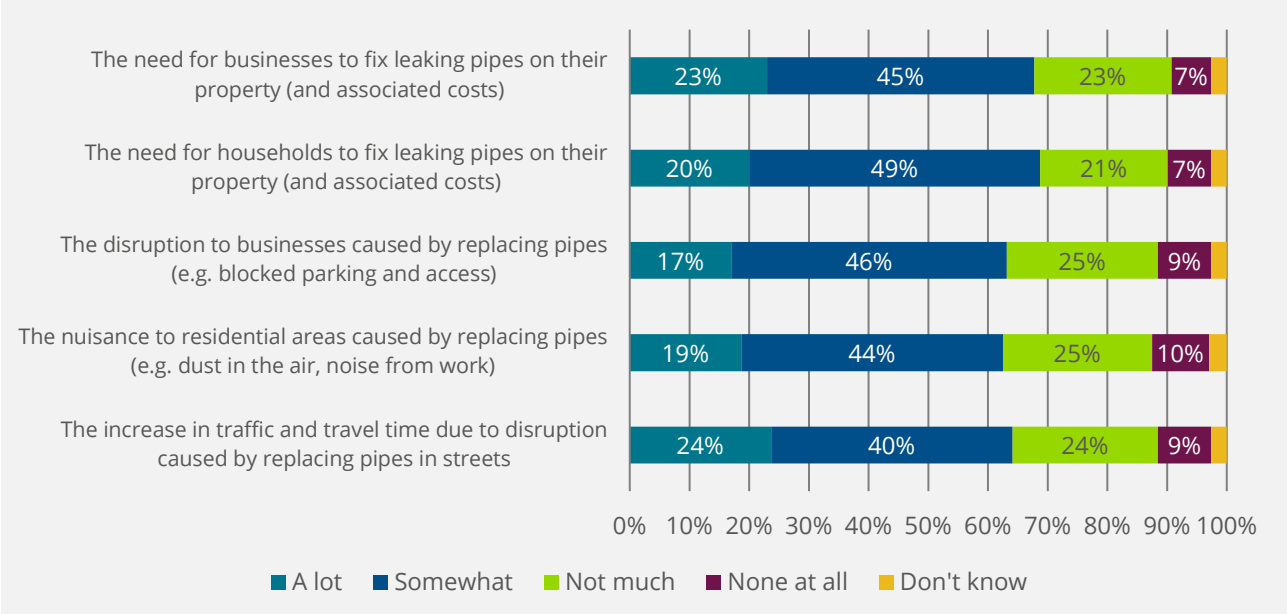


Figure 4.12: Level of concern about impacts of repair works to reduce leakage (n = 304)

Reducing per capita consumption

Non-household respondents' views on reducing water use were broadly consistent the household sample. There was a high level of agreement overall that everyone should play a part in reducing water use (84% "strongly agree" or "agree") and that building standards for new buildings should require more water efficiency (83% "strongly agree" or "agree") (Figure 4.13). There was also a strong view that Government and water companies should support households in using less water (83% "strongly agree" or "agree"). There was, though, compared to household respondents a higher level of support for an explicit target for household water use (64% "strongly agree" or "agree").

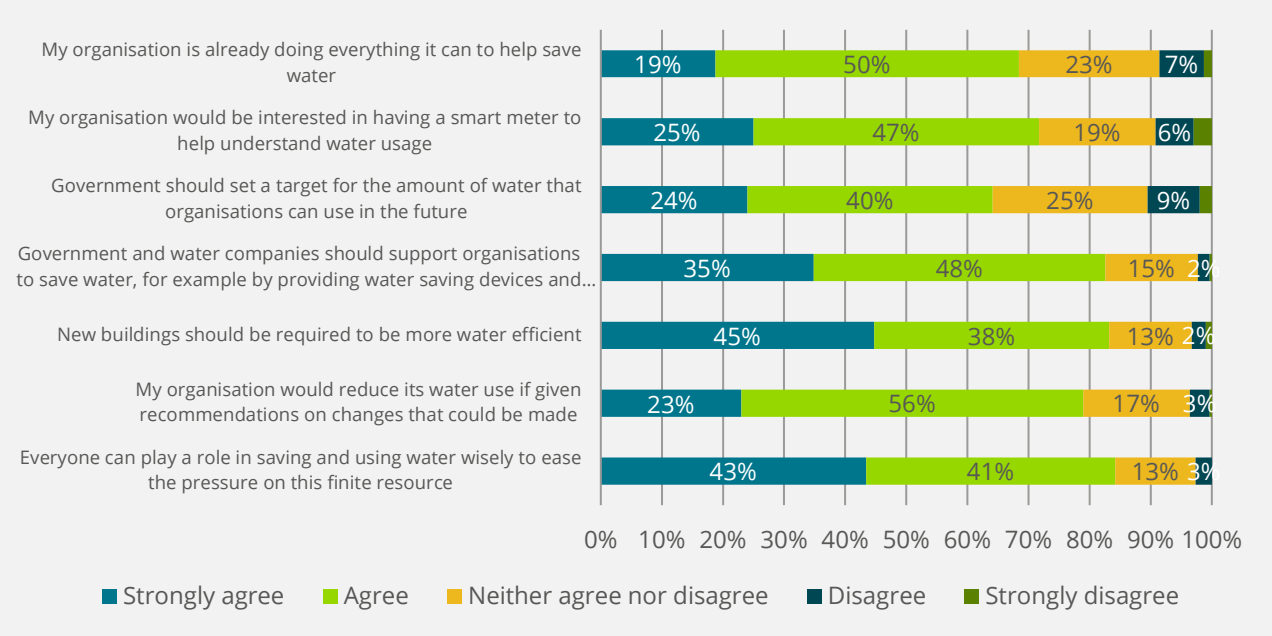


Figure 4.13: Attitudes towards reducing water use (n = 304)

Sharing water

Similar to the household sample, the majority of non-household respondents agreed that if one area of the country has more water than it needs then it makes sense to share (79% "strongly agree" or "agree") and that water should be shared across the country (also 79% "strongly agree" or "agree") (Figure 4.14). There was also some degree of concern about dependency on transfers, with the majority of respondents agreeing that no area should be dependent on another region for its water (65 "strongly agree" or "agree").

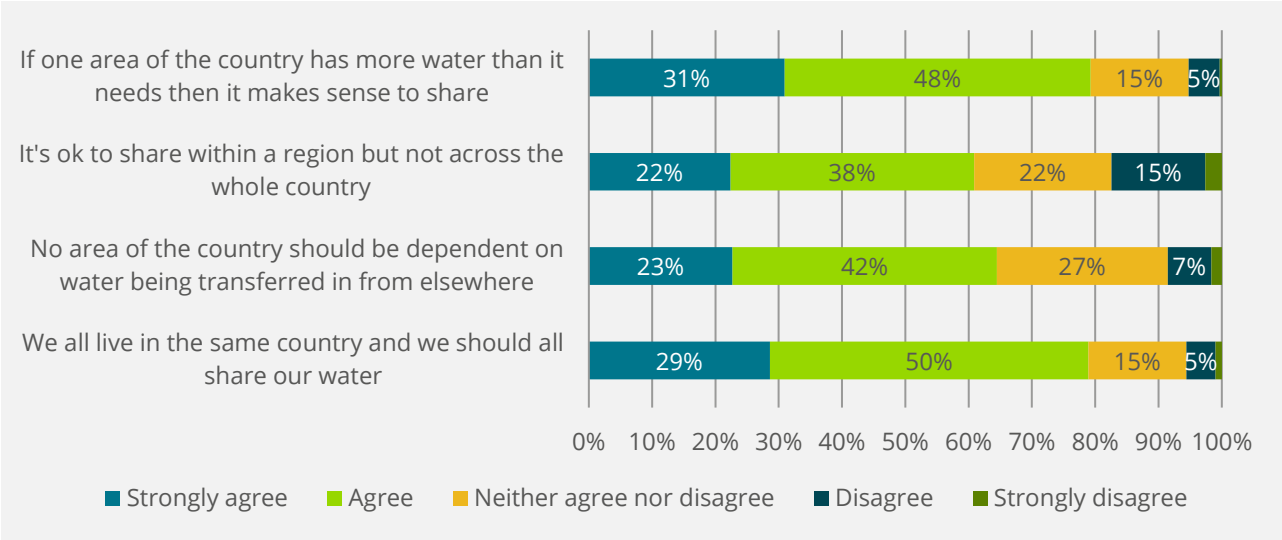


Figure 4.14: Attitudes towards sharing water resources (n = 304)

Compared to household respondents, the non-household sample had slightly more mixed views on what the most important considerations when sharing water (Figure 4.15). The two most important factors were that the risk of water use restriction must not increase and that the aesthetic quality of water should not change for the donor area (both 28% "most important"). There was also a strong view that the recipient area must be doing as much as it can to save water (25% "most important"), especially when taking into account the second most important score (30%).

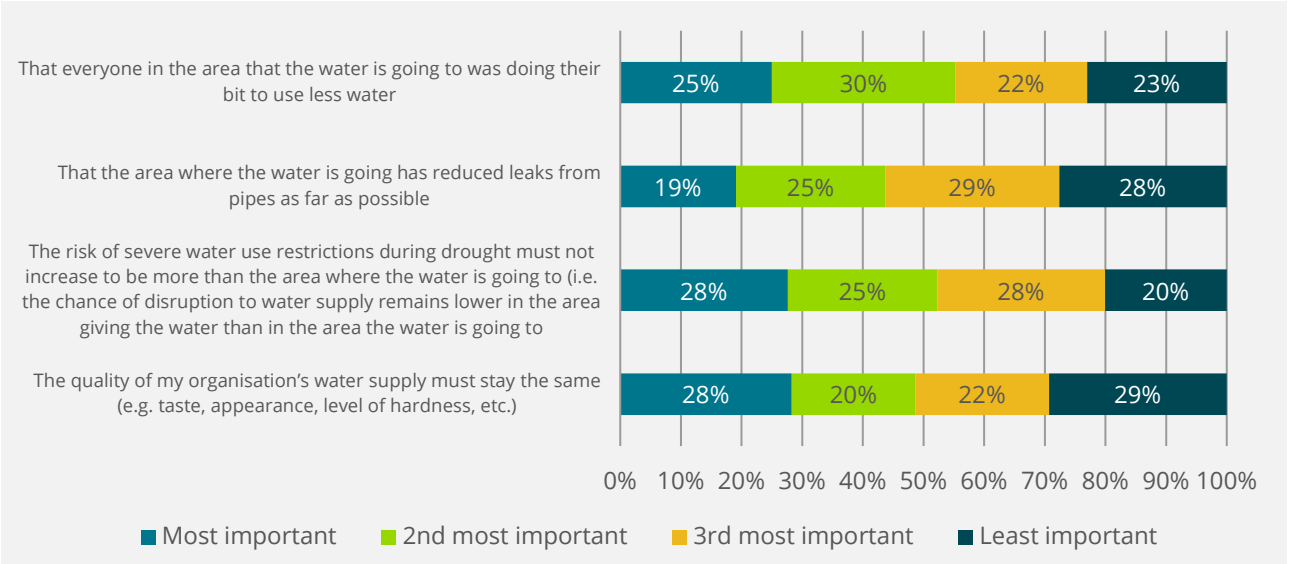


Figure 4.15: Key considerations for sharing water resources (n = 304)

5. Customer preferences

Summary of findings

- This section reports the analysis and results from the choice task on customer preferences for the WCWRG regional plan. Overall, the choice model estimations are robust with a reasonable fit to the data and the pattern of results is generally consistent with expectations.
- Both household and non-households preferred 1-in-500 risk level for severe water use restrictions, but additional weight (benefit) over achieving a 1-in-200 risk level was relatively marginal.
- There was a strong preference for going beyond the minimum level of action to protect and improve the environment. Household respondents placed a high weight on outcomes that would improve the environment for the local communities; non-household respondents' strongest preference was for enhanced outcomes that benefited both biodiversity and local communities.
- Overall, respondents placed minimal additional weight on achieving net zero earlier in 2040 (versus 2050). Household respondents did, though, favour achieving the 2050 50% reduction in leakage target on time (versus maintaining current levels of investment). Non-households did not.
- A per capita consumption level of 110/l/p/d was the preferred target for both household and non-household respondents. This was preferred to both lower and higher reduction levels from a current position of 140l/p/d.
- Customer support for the regional plan (defined as 1-in-500 risk, minimum environmental ambition, 2050 net zero, 50% leakage reduction by 2050, PCC 110l/p/d) is estimated to be above 50% of the customer base if the annual bill increase from 2025 does not exceed £25 - £30.

5.1 Choice model analysis

The discrete choice experiment data are analysed in choice models that examine how respondents selected their preferred options for the regional plan (Scenario A, B, or C) in each repeated choice. As described in Section 2.2, respondents were asked to select: (i) their most preferred scenario for the regional plan from three options shown, and then (ii) their preferred scenario from the two remaining options. This format allows for both the analysis of the preferred option in each choice and additionally analysis of the full preference ordering across the three options shown.

The choice models quantify customers' preferences for the regional plan. They estimate the likelihood of a respondent selecting an option for the WCWRG plan as a function of the levels for the outcomes, constraints and bill impact amounts. The analysis shows customers' demand for the regional plan by quantifying how much different factors influenced their preferred choices.

A number of results and insights can be drawn from the choice model analysis to understand customer preferences and priorities for the plan:

- **Main model estimation**: demonstrates robustness of data and consistency in explaining customer preferences (i.e. primarily shows validity of the research results);
- **Preferences for specific outcomes / targets**: quantified through the calculation of "preference weights" (odds ratios) that show the relative priority for specific outcome levels or meeting targets;
- **Willingness to pay for specific outcomes / targets**: customer preferences for specific targets and outcomes expressed in monetary terms, providing an alternative way of representing their relative priority (in terms of the trade off between increased bill amount and the outcome that respondents were willing to make);
- **Attribute importance**: provides an indication of the (relative) importance of each outcome/ constraint to customers; and
- **Predicted shares**: quantifies customer support for a regional plan scenario (combination of specific outcomes / targets at varying bill amounts) in terms of the proportion of customers that would select it as their preferred option.

Main model estimation

Table 5.1 reports the main model estimation results for respondents' full preference ordering using a rank-ordered logit model. The overall model fit is reasonable in terms of the pseudo R2 indicator, given the respective sample sizes for the household and non-household samples and the non-linear specification of the attribute levels.

The primary interpretation of the model results is based on: (a) the sign (positive/ negative) of the estimate coefficients for each explanatory variable (attribute or attribute level); and (b) its statistical significance. In combination, this indicates how respondents' choices were influenced by the levels of the attributes and the change in cost presented in the choice task. For the plan outcomes and constraint attributes, preferences are also interpreted relative to a "base" level – i.e. whether customers prefer no action or some enhanced level of action. The main observations are:

- **Model validity**: the overall pattern of results for the plan outcomes and constraints is generally consistent with expectations, although the non-linear specification of the attributes shows insensitivity to some enhanced levels of action (see preference weight results below).
- **Cost**: the coefficient for the bill impact is negative and statistically significant (at 1% level) for both household and non-household respondents. This indicates that customer choices were constrained by the cost of the plan scenario, which is a key validity test.
- **Risk of severe water use restrictions**: for both household and non-household respondents, there is a stronger preference for the lowest level of risk for severe water use restrictions (1-in-500) (coefficient estimate statistically significant at the 1% level). This is preferred to the intermediate level (1-in-200), which in turn is preferred to the base case (1-in-100).

Table 5.1: Choice model estimations – rank ordered logit model

Attribute	Level	Household (coefficient)	Non-household (coefficient)
Risk of severe water use restrictions during drought	55% (1 in 100/yr)	base	base
	33% (1 in 200/yr)	0.142***	0.091**
	15% (1 in 500/yr)	0.172***	0.117***
Protect and improve the environment	No action	base	base
	Minimum action	0.157***	0.046
	Moderate action - focus on biodiversity	0.360***	0.169***
	Moderate action - focus on local communities	0.394***	0.101*
	Enhanced action	0.394***	0.241***
Reduce carbon emissions	Achieve target on time (by 2050)	base	base
	Achieve target early (by 2040)	-0.002	0.019
Reduce leakage from pipes	Focus on other priorities	base	base
	Achieve target on time (by 2050)	0.145***	-0.015
Help to reduce the amount of water people use	No reduction (140l/p/d)	base	base
	Minor reduction (125l/p/d)	0.032	0.060
	Moderate reduction (110l/p/d)	0.070***	0.103**
	Major reduction (100l/p/d)	0.057***	0.050
Increase in bill from 2025	Cost	-0.016***	-0.019***
Model fit	No. ranking set	12,564	2,736
	Log-likelihood	-20,493	-4,732
	Likelihood ratio	4032.63	339.55
	LR $\chi 2$ (p-value)	0.000	0.000
	Pseudo-R2	0.09	0.03

Notes: statistical significance: * p<0.1; ** p<0.05; *** p<0.01. See Appendix 6 for full model results

- **Protect and improve the environment**: there is also a clear preference on the part of both household and non-household customers to go beyond the minimum level of action for protecting and improving the environment. Greater weight is placed on the moderate and enhanced levels compared to the minimum or no action (coefficient estimates statistically significant at the 1% level in all but 1 case, which is significant at the 10% level). There is limited distinction though between the moderate and enhanced levels in terms of the preferred outcome.
- **Reduce carbon**: respondents did not place significant weight on meeting carbon reduction targets earlier versus achieving the net zero target on time in 2050 (coefficient estimates not statistically significant).
- **Reduce leakage**: household respondents were supportive of the leakage reduction target, with a preference for achieving the 50% reduction from current levels by 2050 (coefficient estimate

statistically significant at 1% level), versus maintaining current investment levels and focusing efforts elsewhere. In contrast, non-household respondents did not place added weight on the enhanced level of effort versus maintaining current investment levels (coefficient estimate not statistically significant).

- **Reduce water use**: The main strength of preference for reducing per capita consumption is for a moderate reduction (110l/p/d), with this preferred both over no reduction (coefficient statistically significant at the 1% level) or minor reduction, and also a major reduction for both household and non-household respondents. This tends to suggest that respondents perceived greater dis-benefit in terms of impact on water use and daily behaviour from the highest reduction in water use, versus the moderate reduction level.

Preference weights

The main model results can also be presented as preference weights, which provide a more ready interpretation of customers' priorities for the WCWRG regional plan. The preference weights are calculated as "odds ratios" that can be interpreted as quantifying the relative strength of preference (i.e. priority) that respondents assigned to each attribute level. Here, the odds ratios show the relative weight of the level of an outcome/constraint compared to a base level (base level preference weight = 1). A preference weight greater than 1 indicates that the level is preferred relative to the base (e.g. 1.15x "better"); conversely a weight less than 1 indicates that a level is not preferred relative to the base. The difference in weights between each level shows the incremental changes in customer preferences (i.e. how much a level is preferred over another).

Figure 5.1 shows that for both household and non-household respondents, the greatest weight is place on the shift from 1-in-100 risk to 1-in-200 risk for severe water use restrictions (HH OR = 1.15; NHH OR = 1.10). Whilst the 1-in-500 risk level is preferred overall (HH OR = 1.19; NHH OR = 1.12) the additional weight over the 1-in-200 year risk is relatively marginal.

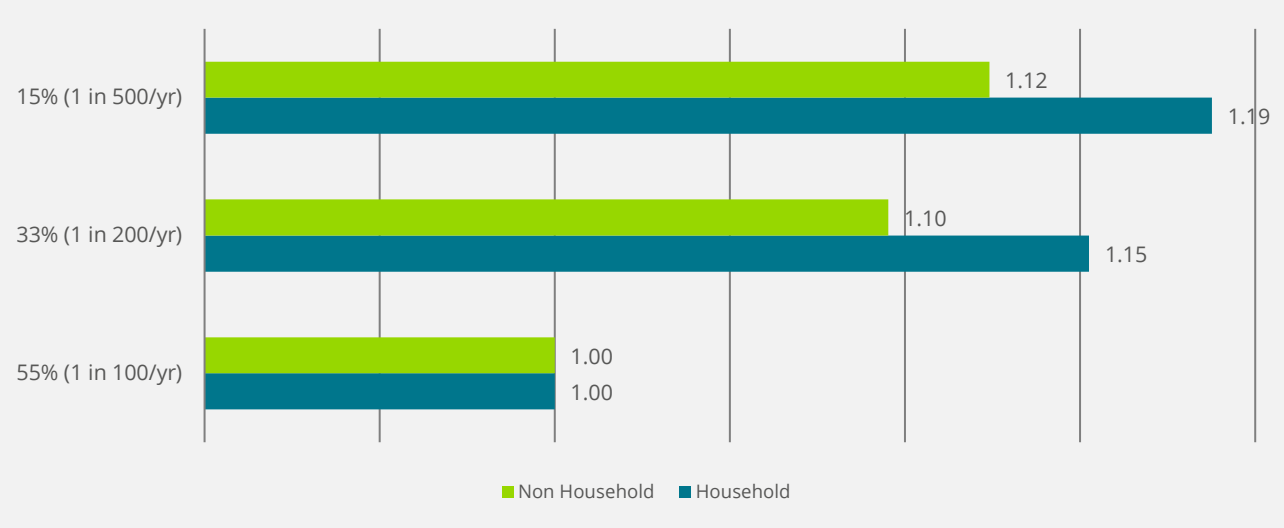


Figure 5.1: Preference weights – risk of severe water use restrictions (odds ratios)

Household respondents showed a strong preference for going beyond the minimum level of action for protecting and improving the environment, but there is limited distinction between the enhanced and moderate outcome levels (Figure 5.2). Overall, the results tend to suggest a preference for improvements

that benefit local communities (HH OR = 1.48), although there is a relatively marginal difference versus a focus on biodiversity at the moderate outcome level (HH OR = 1.43). The highest level with enhanced action for both local community and biodiversity is not differentiated above the moderate level for local communities (HH OR = 1.48).

Non-household customers also had a strong preference for going beyond the minimum level of action, but in contrast placed more weight on improving biodiversity (NHH OR = 1.18) over benefits to local communities (NHH OR = 1.11). There is also a clearer overall preference for achieving the enhanced level of actions with benefits for both local communities and biodiversity (NHH OR = 1.27).

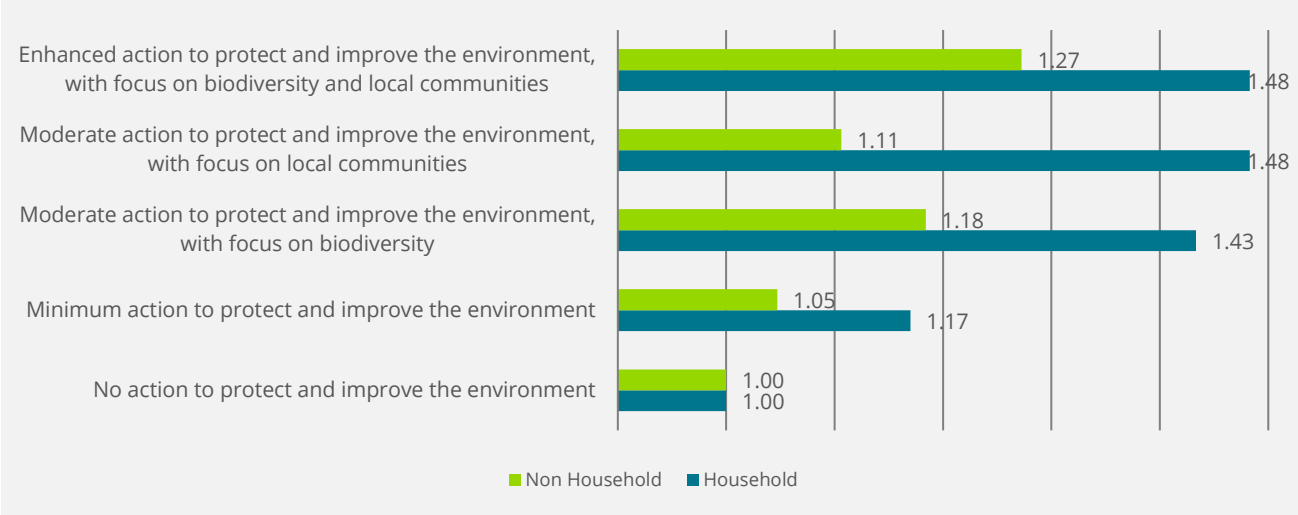


Figure 5.2: Preference weights - protect and improve the environment (odds ratios)

Figure 2.1Figure 5.3 shows the finding highlighted in the main model estimation (Error! Reference source not found.), where both household (HH OR = 1.02) and non-household (NHH OR = 1.00) respondents placed minimal additional weight on achieving net zero earlier in 2040 versus 2050.

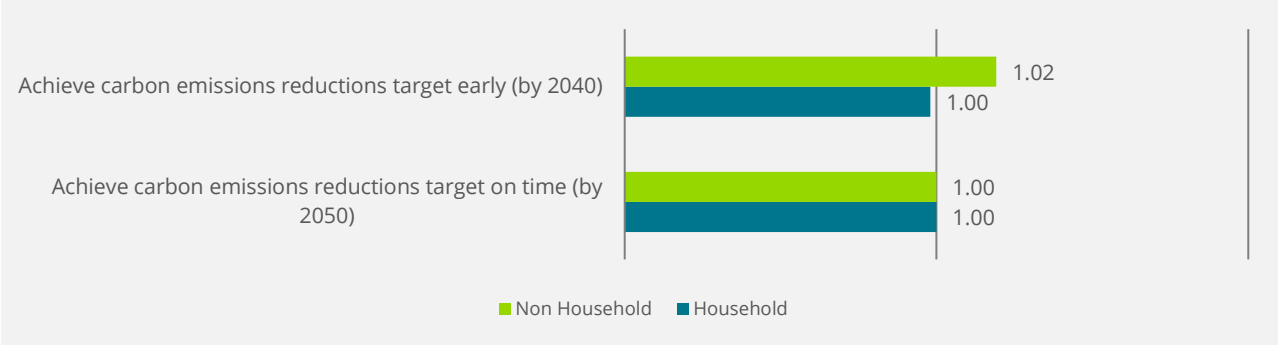


Figure 5.3: Preference weights - reducing carbon emissions (odds ratios)

Household respondents' support for achieving the leakage reduction target on time (2050) is shown in Figure 5.4 (HH OR = 1.16). Non-household respondents did not place any additional weight on achieving the target versus maintaining current levels of investment (NHH OR = 0.99).

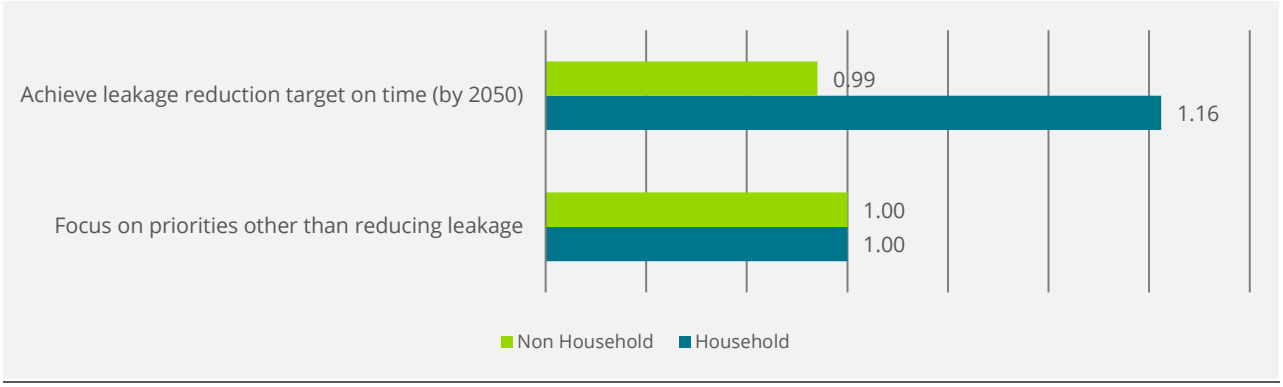


Figure 5.4: Preference weights – reducing leakage from pipes (odds ratios)

Household and non-household respondents had similar pattern of preferences for PCC (Figure 5.5), with the greatest weight placed on a moderate level of reduction to 110l/p/d (HH OR = 1.11; NHH OR = 1.07). For non-households there was limited distinction between the major level (NHH OR = 1.05) and minor level of reduction (NHH OR = 1.06) versus the base case of no reduction. Household respondents had a stronger preference for the major level of reduction (HH OR = 1.06) compared to the minor level (HH OR 1.03).

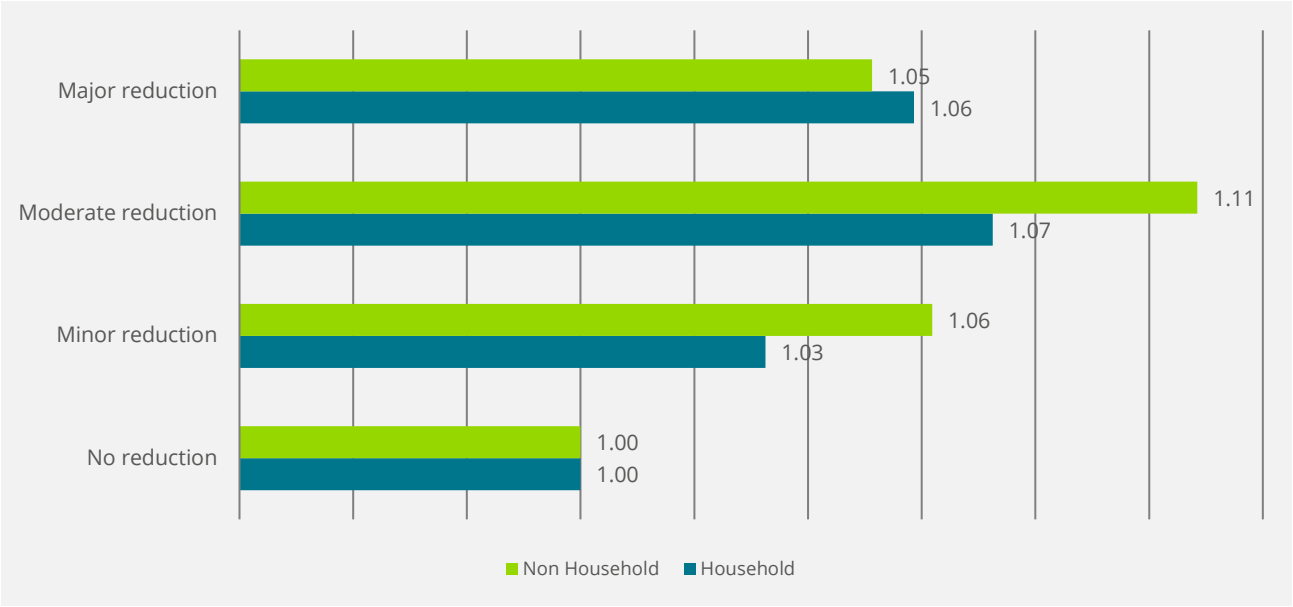


Figure 5.5: Preference weights – Helping reduce the amount of water people use (odds ratios)

Preference weights for best valuing planning

The results presented above quantify the relative importance of different levels of outcome or target within specific aspects of the plan (i.e. level of resilience, level of environment ambition). Depending on the approach taken – i.e. the specifics of the MCDA framework[4] - best value planning may require customer preference weights at the criteria level, such as "resilience", "environment", "demand". Appendix 7 presents results at this higher level, including the calculation of preference weights for potential best value planning criteria.

[4] UKWIR (2020) Deriving a Best Value Water Resources Management Plan: Final Report.

Willingness to pay estimates (WTP)

Household and non-household preferences for the regional plan outcomes can also be expressed in monetary terms as willingness to pay (WTP) values. These are calculated as the trade-off for respondents between the outcome level and cost (bill impact); hence WTP estimates represent the value (benefit) to customers in terms of the amount of money (income) they are prepared to give up to secure the outcome[5].

Household WTP values are reported in Table 5.2 for the step change from the base level for each attribute/outcome. The pattern and interpretation of results is broadly the same as for the preference weights above. For instance, the (mean) average WTP value for achieving 1-in-500 risk of severe water use restrictions is approximately £11 per household per year. The benefit to customers of achieving 1-in-200 risk is approximately £9 per household year; hence the greater weight is placed on achieving the intermediate risk level, with a relatively modest additional benefit value of going beyond this to 1-in-500 (approx. £2 per household per year).

Table 5.2: Household WTP for regional plan outcomes (£/hh/yr)

Attribute	Level	Mean	95% confidence interval
Risk of severe water use restrictions during drought	55% (1 in 100/yr)	base	-
	33% (1 in 200/yr)	8.92	6.74 - 11.10
	15% (1 in 500/yr)	10.81	8.62 - 13.00
Protect and improve the environment	No action	base	-
	Minimum action	9.89	6.88 - 12.90
	Moderate action - focus on biodiversity	22.68	19.55 - 25.81
	Moderate action - focus on local communities	24.81	21.63 - 27.99
	Enhanced action	24.83	21.69 - 27.97
Reduce carbon emissions	Achieve target on time (by 2050)	base	-
	Achieve target early (by 2040)	-	-2.02 - 1.74
Reduce leakage from pipes	Focus on other priorities	base	-
	Achieve target on time (by 2050)	9.13	7.22 - 11.04
Help to reduce the amount of water people use	No reduction (140l/p/d)	base	-
	Minor reduction (125l/p/d)	1.99	-0.68 - 4.66
	Moderate reduction (110l/p/d)	4.38	1.70 - 7.06
	Major reduction (100l/p/d)	3.59	0.90 - 6.28

[5] Willingness to pay is calculated a $-\beta$ level / β cost, where "level" is the relevant outcome/constraint level and β is the coefficient estimate from the main model estimation. Note that WTP values reported here should be interpreted with caution, particularly when compared to results from other studies. They are best interpreted as measures of strength of customer preference and the relative importance of different outcomes within the context of the WCWRG regional plan. This is due to the framing of the choice task where respondents were only choosing among alternative scenarios for the regional plan (no opt out or zero cost alternative was offered) and the focus was on the balance of the plan in relation to the longer-term outcomes as per the strategic planning context, rather than comparing each future outcome to an explicit current day position (i.e. the current level of service). Hence the "reference point" for customer values may differ from other studies and WTP estimates may not be directly comparable.

The results also show that no additional value is placed on achieving net zero early (WTP estimate not statistically different from zero) and that there is a potential "disbenefit" to customer of PCC reduction beyond 110l/p/d (approx. £4.40/hh/yr for moderate reduction vs. approx. £3.60/hh/yr for major reduction, giving an approx. -£0.80 disbenefit). The respective 95% confidence intervals, however, overlap so it is not possible to conclude that the two WTP estimates are statistically different.

Results for non-household respondents are reported in Table 5.3 equivalent to the percentage change in current bill. Again, the pattern of results and interpretation follows the preference weights results. Compared to the household estimates, the non-household WTP values are less precisely estimated, as indicated by the wider 95% confidence intervals. This is due to the small sample size and as a result the statistical significance of the NHH WTP estimates is generally lower.

Table 5.3: Non-household WTP for regional plan outcomes (% bill/nhh/yr)

Attribute	Level	Mean	95% confidence interval
Risk of severe water use restrictions during drought	55% (1 in 100/yr)	base	-
	33% (1 in 200/yr)	4.90	(1.05 - 8.74)
	15% (1 in 500/yr)	6.31	(2.40 - 10.22)
Protect and improve the environment	No action	base	-
	Minimum action	2.47	(-2.88 - 7.82)
	Moderate action - focus on biodiversity	9.07	(3.58 - 14.56)
	Moderate action - focus on local communities	5.42	(-0.06 - 10.89)
	Enhanced action	12.99	(7.41 - 18.58)
Reduce carbon emissions	Achieve target on time (by 2050)	base	-
	Achieve target early (by 2040)	1.04	(-2.28 - 4.36)
Reduce leakage from pipes	Focus on other priorities	base	-
	Achieve target on time (by 2050)	-	(-4.14 - 2.55)
Help to reduce the amount of water people use	No reduction (140l/p/d)	base	-
	Minor reduction (125l/p/d)	3.22	(-1.55 - 8.00)
	Moderate reduction (110l/p/d)	5.52	(0.76 - 10.29)
	Major reduction (100l/p/d)	2.70	(-2.05 - 7.46)

Attribute importance

"Attribute importance" provides a supplemental measure of the relative importance of each outcome/constraint to respondents. Results, though, do need to be interpreted with caution. Whereas preference weights and WTP values reflect priorities in terms of specific outcomes/levels, attribute importance is calculated over the range of levels specified for each outcome/constraint. This means that an attribute with a "wider range" or more levels will tend to have a higher level of importance. Results are therefore more indicative, but nevertheless, the ordering of the attribute importance can be informative so long as it is recognised that the relative proportions are specifically tied to the attribute

levels and ranges defined in the choice task. Results for both household and non-household respondents are reported in Table 5.4

Table 5.4: Attribute importance

Household (range)	Importance (%)	Non-Households (range)	Importance (%)
Increase in bill from 2025 (£0 - £100/yr)	57%	Increase in bill from 2025 amount (0 - +50%/yr)	54%
Protect and improve the environment (no action – enhance action)	20%	Protect and improve the environment (no action – enhance action)	17%
Risk of severe water use restrictions (1-in-100 – 1-in-500)	11%	Risk of severe water use restrictions (1-in-100 – 1-in-500)	15%
Reduce leakage from pipes (2050 target vs. current investment)	8%	Reduce the amount of water people use (140l/p/d – 100/p/d)	6%
Reduce the amount of water people use (140l/p/d – 100/p/d)	2%	Reduce leakage from pipes (2050 target vs. current investment)	4%
Reduce carbon emissions (2040 vs 2050 net zero)	1%	Reduce carbon emissions (2040 vs 2050 net zero)	4%

The weight placed on the bill impact over the range of levels presented to respondents (£0 - £100 per year for HH respondents; 0 – 50% current bill for NHH respondents) results in it having the greatest level of importance (over one half of the total share). Beyond this environment and resilience – the plan outcomes – are second and third level importance, respectively, followed by the three plan constraints (leakage, PCC, carbon). For both groups of customers, net zero is the least important aspect of the regional plan. Both results are consistent with the low priority level (minimal preference weight) that was placed on these aspects of the plan by household and non-household respondents, respectively.

Predicted shares – customers' preferred plan

The final set of results (predicted shares) estimate the proportion of customers that would choose a particular scenario for the regional plan, based on a specific combination of attribute (outcome and constraint) levels. Figure 5.6 presents results for household respondents for the following regional plan at varying levels of bill impact (from 2025 onwards)[6]:

- Risk of severe water use restrictions during drought: 1-in-500
- Protect and improve the environment: Minimum action
- Reduce carbon emissions: Net zero by 2050
- Reduce leakage from pipes: Target met by 2050
- Help to reduce the amount of water people use: moderate reduction in use (110l/p/d)

[6] Predicted share results are shown for the household sample. Equivalent results for the non-household respondents are subject to greater uncertainty levels given the relatively small sample size; although the same broad patterns of results are observed.

Results show the expected negative relationship between customer support (predicted share) and bill impact, with the level of customer support declining as the change in customer bill increases. At a relatively modest level of annual bill increase (around £5/hh/yr) household customer support for the regional plan is estimated to be above 60% of the regional customer base. The level of support drops below 50% of the regional customer base around a bill impact of £35 per household per year. Less than one-third of customers would support the regional plan if the bill impact was greater than £80 per household per year.

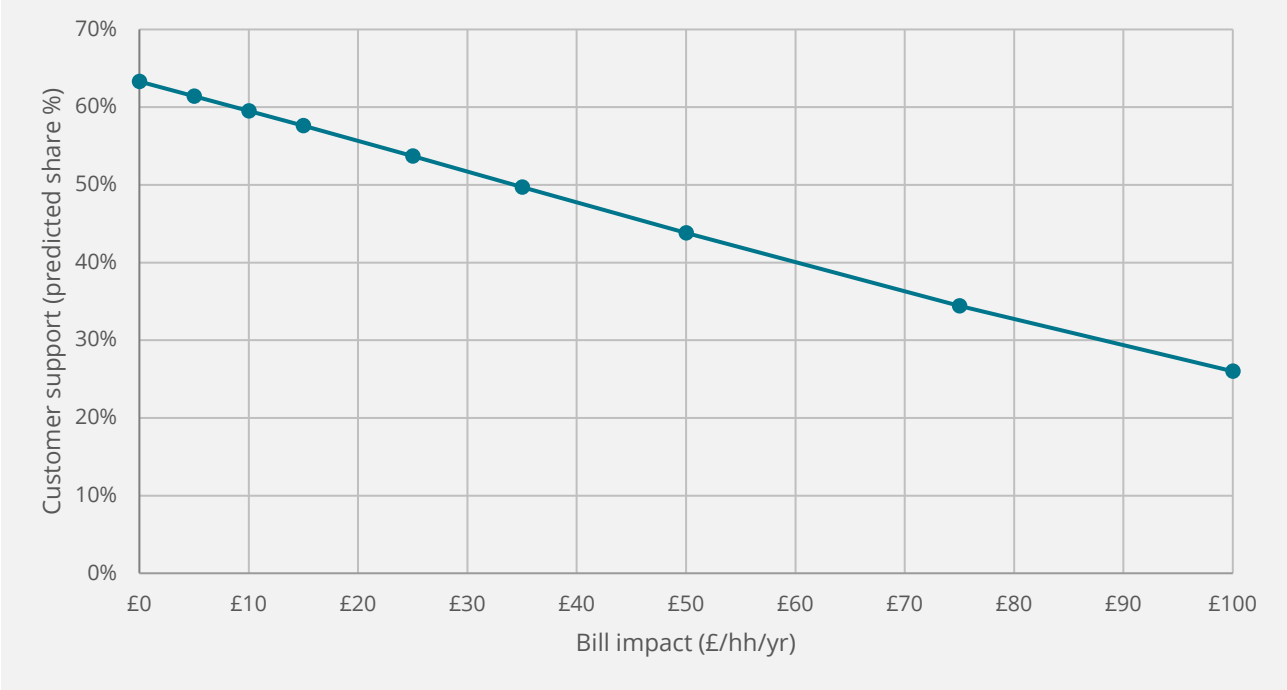


Figure 5.6: Customer support for regional plan by bill impact level (households)

The level of customer support for alternative plan scenarios can also be examined, showing the degree of sensitivity to the different levels for outcomes and constraints. Selected results are shown in Table 5.5 for six scenarios:

- Scenario 1 – Base: regional plan as defined for results reported in Figure 5.6.
- Scenario 2 – Low resilience: as Base but with 1-in-200 risk of severe water use restrictions.
- Scenario 3 – Enhanced environment: as Scenario 1 but with enhanced action to protect and improve the environment (outcomes for biodiversity and local communities).
- Scenario 4 – No additional leakage reduction: as Scenario 1 but no added investment and effort to meet 50% reduction in leakage by 2050.
- Scenario 5 - Major consumption reduction: as Scenario 1 but with PCC target of 100l/p/d.

Table 5.5: Customer support for regional plan by bill impact level (households)

Bill impact (£/hh/yr)	Scenario 1 - Base	Scenario 2 – Low resilience	Scenario 3 – Enhanced environment	Scenario 4 – Missed leakage target	Scenario 5 - Major consumption reduction
£5	61%	61%	67%	58%	61%
£25	54%	53%	60%	50%	53%
£50	44%	43%	50%	40%	44%

Overall, the difference in level of support for each scenario at each bill impact level is relatively modest. The highest level of support is observed for Scenario 3 (base plus enhanced action to protect and improve the environment). Achieving a lower level of resilience to severe drought (1-in-200 risk of severe was use restrictions) has a very marginal impact on customer support, which is more pronounced at higher bill impact levels. Not meeting the leakage target has biggest negative effect on the level of support from household customers – compared to Scenario 1 – at each bill level.

5.2 Validity testing

The two main aspects for assessing the validity of stated preference studies are 'content validity' and 'construct validity'[7]. These considerations cover both the main empirical results from the study (the choice model analysis) and wider considerations in relation to respondent understanding and the motivations for their responses.

Construct validity

Construct validity is primarily concerned with the robustness of the choice models and how well they explain respondent preferences based on reasonable expectations; both in relation to previous empirical research and underlying economic theory. Overall, the customer preference results reported in Section 5.1 are in line with expectations. The main model estimations have a satisfactory fit to the data given the non-linear specification and coefficient estimates have the expected sign (where relevant). Moreover, the majority of the coefficient estimates are found to be highly statistically significant, and the pattern of results show the expected direction of effect in terms of customer priorities. Where results are less precisely estimated, it is primarily due to limited sample size versus the demands of the model specification (e.g. non-household results).

More specifically, various aspects of the findings demonstrate the validity of the results, including:

- Customer preferences as represented by the choice model estimations are constrained by the cost attribute (bill impact), and the preference ranking for regional plan scenarios is seen to be decreasing in cost;
- Consistent with reasonable expectations, there is evidence of diminishing marginal benefit associated

[7] A further dimension is convergent validity which relates to how study results compare to similar studies to see if they produce similar results, or if they vary in a predictable way. However, this assessment is difficult to make for this study due to it being a "new" application for customer preference research in the sector, and therefore – to best knowledge – no comparators.

with higher level outcomes from the plan, particularly in relation to resilience (risk of severe water use restrictions) and protecting and improving the environment. This indicates that customer place greater weight or value on initial improvements and less additional weight on further enhancements.

In general, such findings are good indicators of the validity of the study's empirical results that underly the interpretation of customer preferences for the regional plan outcomes.

Content validity

The assessment of content validity involves examining whether respondents understood what they are being asked for within the choice task, verifying that they thought that the task was credible, and confirming that respondents were answering accordingly. Given this, some aspects of content validity are assessed in the survey design phase via the cognitive interviews and the test-re-test process used to do develop the survey materials.

As summarised in Section 2.1, the survey was well received by the customers who participated in the cognitive testing interviews and the overall findings from the exercise were encouraging in terms of respondent understanding and motivations for choices. The following summarises results from the follow-up questions to the choice task that also support the assessment of content validity.

Respondent understanding

The majority of respondents (HH 55%; NHH 69%) stated that the choice task was "fairly easy" or "very easy" to complete (Figure 5.7). Whilst around a quarter of the household respondents stated that the choice task was either "Fairly difficult" or "Very difficult" (23%), the majority reported that this was due to it being hard for them to decide which options were the best, rather than not understanding the exercise (Figure 5.8).

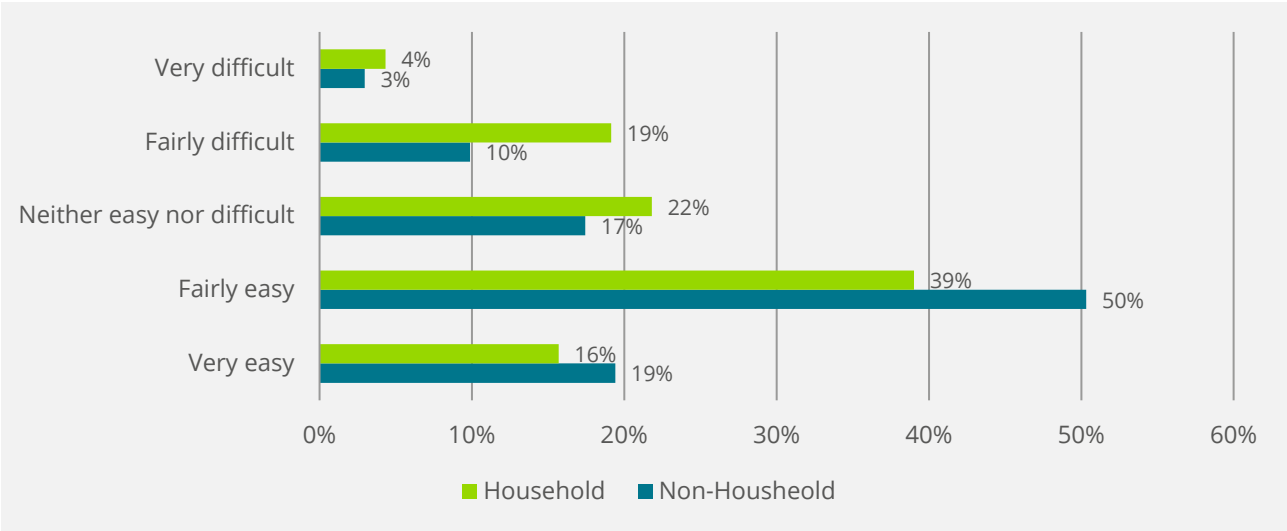


Figure 5.7: Ease/difficulty of choice task (HH n = 1,504; NHH n = 3,04)

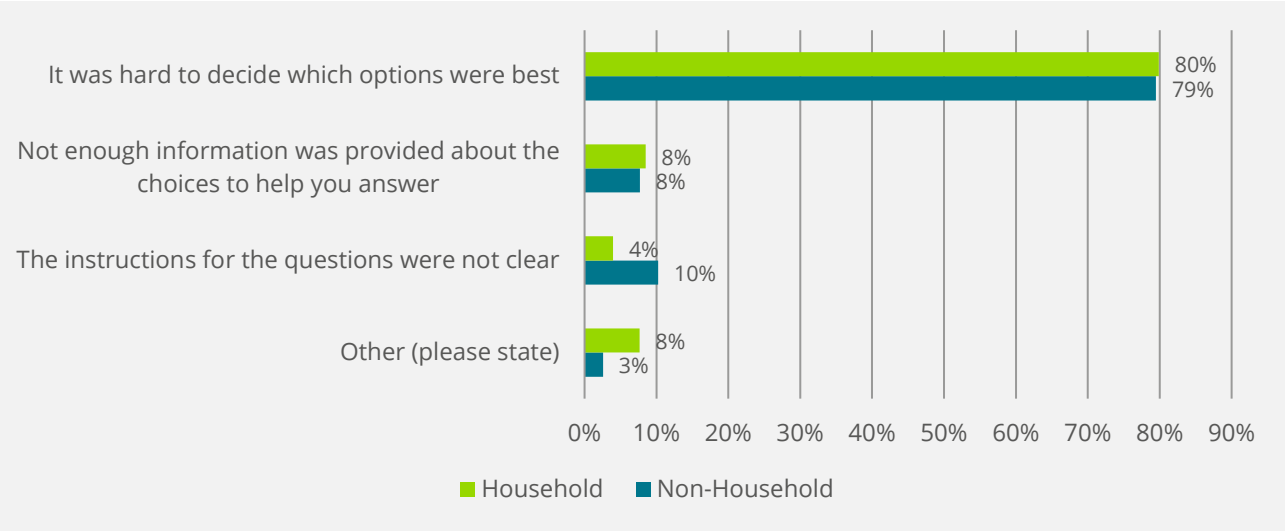


Figure 5.8: Reasons for difficulty in responding to the choice task (HH n = 353, NHH n = 39)

Very few respondents overall stated that the choice task instructions were not clear (14 household respondents and 4 non-household respondents, representing less than 2% of the total sample) or that there was insufficient information given to make a considered choice (30 household respondents and 3 non-household respondents, representing less than 2% of the total sample.

Attribute attendance

Figure 5.9 summarises the self-reported level of consideration household respondents paid to each attribute (outcome/constraint) in the choice task. Results show that in all cases the majority of respondents (>60%) stated that they considered an attribute in either "all" or "most" choices. The least attention was paid to reducing carbon emissions (63% in "all" or "most" choices), consistent with the limited influence this constraint had on respondents' choice of preferred scenarios for the regional plan. Results for non-household respondents show a similar pattern across the choice task attributes (Figure 5.10).

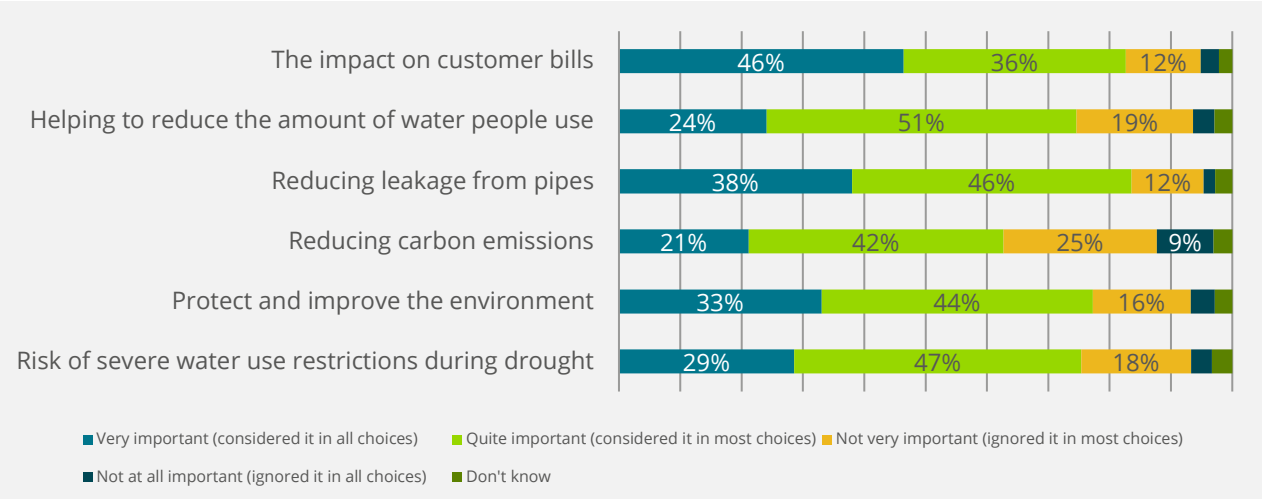


Figure 5.9: Choice task attribute attendance – household respondents (n = 1,504)

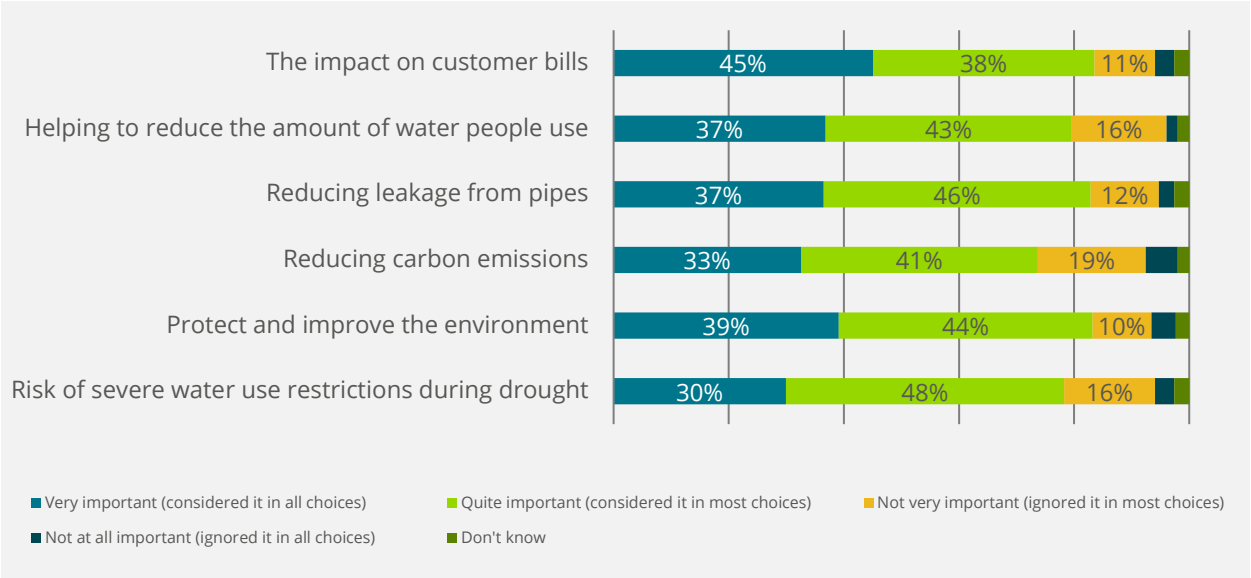


Figure 5.10: Choice task attribute attendance – non-household respondents (n = 304)

Bill impact of the regional plan

Responses to follow-up questions on the bill impact of the regional plan – which would depend on the specific actions and investments that will eventually put forward - were mixed (Figure 5.11; Figure 5.12). There was a relatively strong view that the plan should not increase customer bills overall (HH 56% either "strongly agree" or "agree"; NHH 65%), or that bills should be kept as low as possible now even if that meant future generations will see reductions in service reliability and/or larger bill increases (HH 49% either "strongly agree" or "agree"; NHH 60%). That said, similar proportions of respondents indicated an acceptance of future bill increases that would pay for investments to reduce the risk of severe water use restrictions (HH 43% either "strongly agree" or "agree"; NHH 69%) or protect the environment (HH 48% either "strongly agree" or "agree"; NHH 66%). Therefore, findings broadly align to the choice task responses, with a clear preference from customers for a lower bill impact overall, but a view that investments to address long-term resilience and protection of the environment are valuable and hence a positive preference for these outcomes over relatively modest bill increase levels.

The highest level of agreement overall was that bill increases would be acceptable if financial assistance schemes were in place to protect the least able to pay and most vulnerable customers (HH 66% either "strongly agree" or "agree"; NHH 74%).

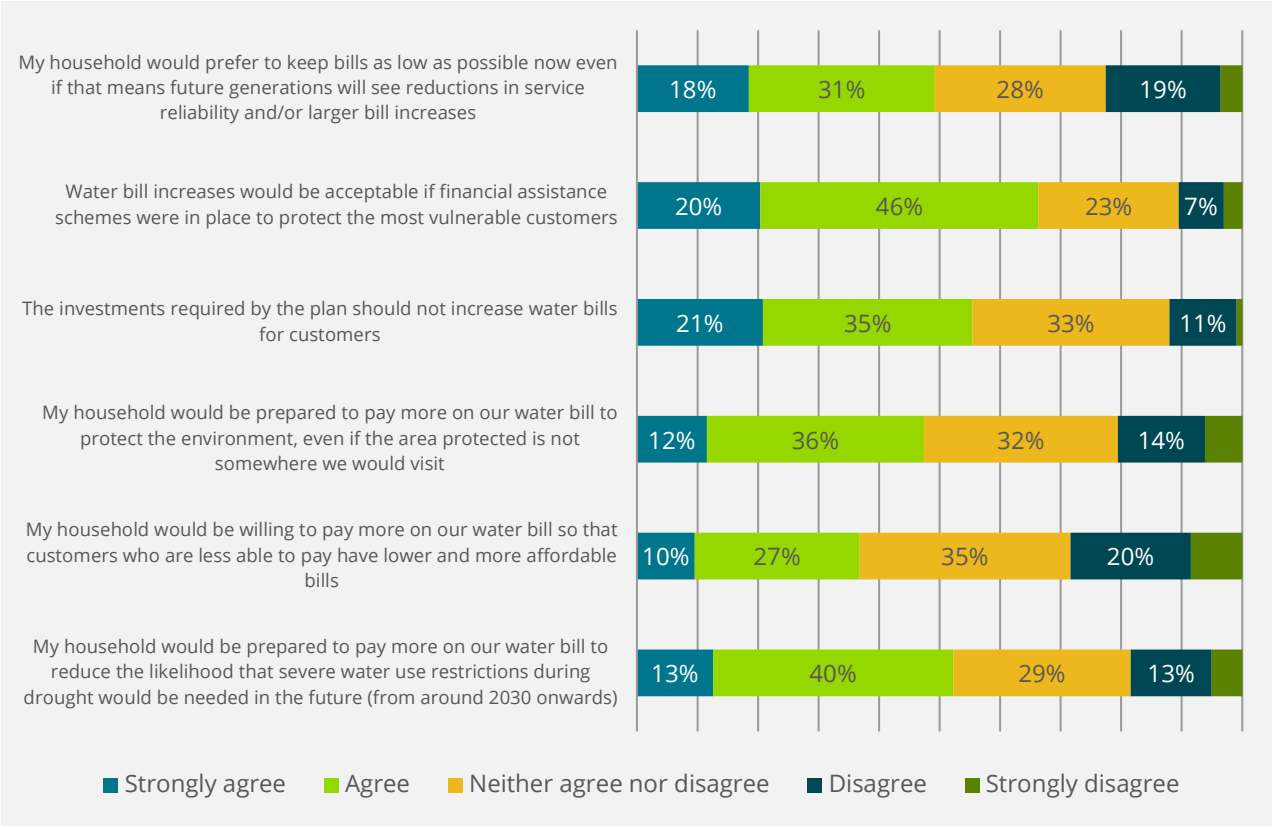


Figure 5.11: Views on bill impact – households (n = 1,504)

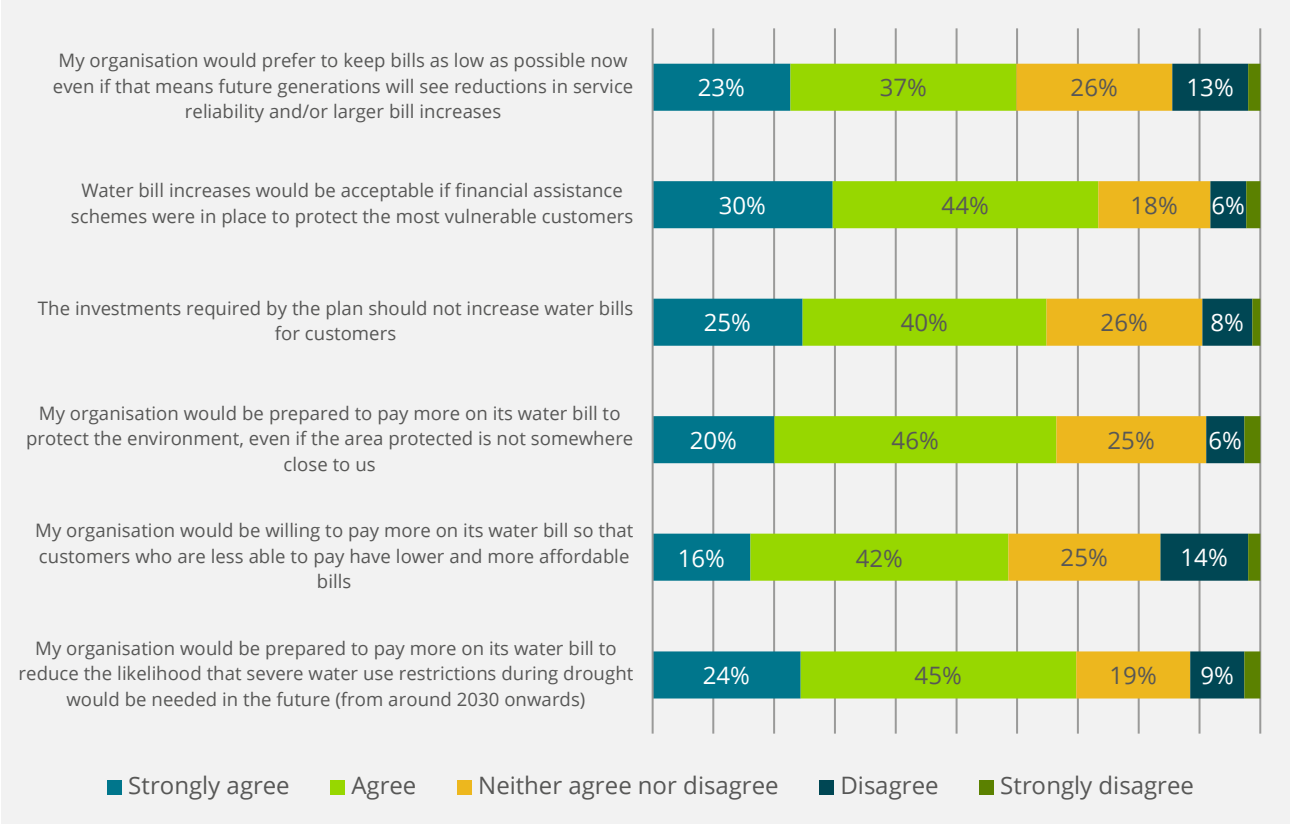


Figure 5.12: Views on bill impact – non-households (n = 304)

Overall feedback

Overall feedback on the survey was positive, suggesting that respondents for the most part were engaged in the topic and issues covered. The majority of respondents stated that the survey was interesting (HH 61%; NHH 61%) and a sizeable proportion also stated that it was educational (HH 25%; NHH 27%). In contrast lower proportions of respondents noted that the survey was too long (<25%), difficult to understand (≤10%) and/or not credible (≤5%).

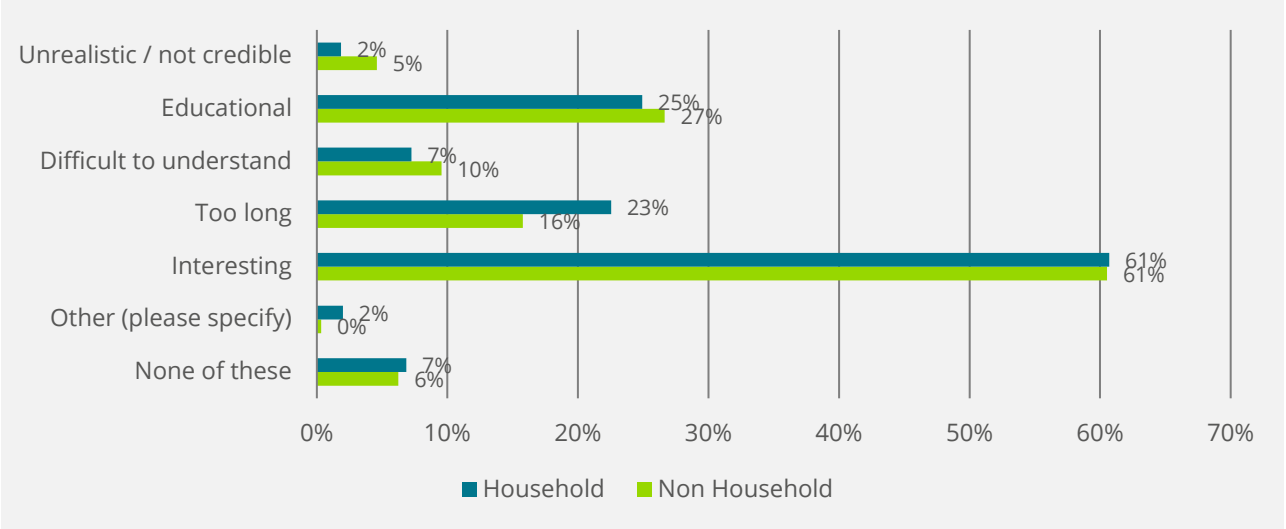


Figure 5.13: Overall survey feedback (HH n = 1,504, NHH n = 304)

6. Conclusions

6.1 Summary

WCWRG is developing the regional water resource plan for the South West. The aim is to ensure that water supplies are managed and secured over the long term, meeting the needs of households and businesses now and in the future. The plan will address future challenges including changing climate, changing weather patterns, and population growth. It will need to balance enhanced levels of drought resilience and environmental protection with ambitious targets for reducing leakage, water use and carbon emissions, along with the cost and pace of investment needed to deliver the plan, particularly taking account of the affordability for customers.

This report summarises the approach, method, analysis and findings from quantitative research that examined customers' preferences for the key outcomes and constraints for the regional plan. It is complemented by qualitative research that addressed the broader policy and strategic issues for the regional plan. In combination the two phases of research provide a wide-ranging view of customers' priorities that will support the development of the best value regional plan for the South West.

The quantitative research used a stated preference methodology and involved the design, testing, implementation and analysis of a customer survey. The core component of the survey was a choice task in which customers selected their preferred scenarios for the regional plan. The scenarios were described in terms of the risk of severe water use restrictions, the level of environmental ambition, and varying targets for leakage, water use (per capita consumption) and net zero carbon, and along with the bill impact for customers. The main results are customer preference weights and values that quantify the relative importance of these regional plan outcomes and constraints. The results also provide a basis for estimating the level of customer support for alternative scenarios for the regional plan.

The survey was implemented with representative samples of household and non-household customers. A good geographic spread of respondents was also achieved across the WCWRG region overall and for each company area. The overall survey results, respondent feedback, and findings from the survey testing stage indicate that customers engaged well with the survey content, understood the choice task exercise, and provided considered responses.

6.2 Key findings

The research findings and choice task results are robust and provide a coherent view of customer preferences for the regional plan:

- Respondents recognised the impact and disruption that severe water use restrictions during a period of prolonged drought would have on daily activities. However, it is evident that the perceived benefit of moving from a 1-in-200 to a 1-in-500 risk level is relatively marginal for customers. Greater weight was placed on achieving the 1-in-200 level versus a deteriorated level of service at 1-in-100.

- There was strong support from both household and non-household respondents for measures that will reduce the dependency of the water supply system on surface and groundwater abstractions,

particularly from sensitive catchments. There was a clear preference for going beyond the minimum requirements for the environmental ambition of the plan, to provide enhanced outcomes for biodiversity in the region and also benefit communities by improving local environmental quality.

- Targets for net zero carbon and increased effort to reduce leakage tended to be secondary factors for customers. Household respondents had a clear preference for the 50% reduction in leakage by 2050 target to be achieved. Non-households, however, did not favour enhanced effort for reducing leakage over continuing levels of repair and maintenance. Whilst there was a good level of support from both household and non-household customers for companies' ambition to achieve net zero carbon across operations by 2050, there was no over-riding preference for achieving emissions reductions earlier. In general, reducing carbon emissions was not seen as the top priority for the regional plan given other needs around drought resilience and environmental protection.

- There was a willingness on the part of respondents to undertake actions that would reduce water use, but a large share of respondents also had the view that more support was needed from companies and Government to help achieve this. The strongest level of support from both households and non-households was for a moderate level of reduction in water use. The survey results suggest that customers may perceive a disbenefit – in terms of impacts on day-to-day use of water – from reductions below 110/l/d. Beyond this point it appears that the impact on customers' use of water starts to outweigh the preference that they have for taking actions that help protect the environment.

Overall, the research shows that there is a good level of support for the outcomes and targets that the regional plan is aiming to achieve and - particularly in relation to the environmental ambition – a preference for companies to go beyond the minimum requirements. The bill impact from 2025 onwards is, though, a key factor for customers. The tipping point, in terms of support for the plan from the majority of customers, appears to be around £30 per year. Below this a larger share of the customer base would likely see the plan as "value for money". Above it fewer would likely be supportive of the plan, even if it offered enhanced environmental outcomes over the minimum requirements.

Appendix 1 : Cognitive testing

A1.1 Objectives

The purpose of the cognitive testing was to:

- Test whether customers understood what the survey was about and what its purpose was;
- Understand what and how much contextual information was required by customers
- Test the layout and appearance of the survey;
- Test how much effort was required to complete the survey;
- Assess how easy or difficult it was to complete, and to assess the clarity of instructions;
- Evaluate how well people understood the choice task; and
- Understand the thinking behind how customers made their choices.

A1.2 Research process

The survey design and testing phase utilised 10 cognitive interviews undertaken in November and December 2021. These were carried out across three phases to allow for survey iterations. The first phase comprised three interviews, phase two comprised two interviews, and five were undertaken in the last phase. The cognitive interviews were conducted online, and as an assessment of visual stimulus was required, Zoom was used to achieve this.

The testing phase assessed all the materials (questionnaire wording and showcards) to check they were clearly understood by participants. It sought to clarify any ambiguities and ensured that information could be presented in the most meaningful way to customers. It therefore played a crucial part in making sure the survey was fit for purpose before moving on to the pilot stage and eventually, the main stage of the survey.

In terms of recruitment, all participants had to be solely, or jointly, responsible for paying their household bills. In addition, a broadly equitable split of customers in terms of age, gender and socio-economic group was desirable, and was duly achieved.

A1.3 Key Findings

Understanding

Overall, people understood what the survey was about and what they were being asked to do in the cognitive interviews. They cited various responses as indicated in the Table 1 below:

Table 1: Purpose of survey

Purpose of Survey	Number of Mentions
Preferred water resource options / trade offs	6
Planning for the future	5
Environmental focus and improving the carbon footprint	5
Reflect customer wishes and expectations	5
Potential costs and impact on bills	3
Reducing water use	1

Some verbatim comments illustrating the above categories are shown below.

Preferred water resource options / trade offs

"Looking at how we trade off the environment with carbon footprint and leaks…" – Phase 1

"…opinions on the environment versus the price people are willing to pay to help companies improve" – Phase 2

"To gauge opinions on what's most important to customers" – Phase 3

"To get opinions on what water companies need to do and gauge the balance of how far we should go" – Phase 3

Planning for the future

"To consider all aspects of changes of the future water supply" – Phase 1

"…trying to get buy in to what water companies are planning in the future" – Phase 1

"To contribute to the strategic aims of the companies in the future" – Phase 2

Environmental focus and carbon footprint

"Water companies looking to improve the carbon footprint" – Phase 1

"Gauge customer views on how water can become more sustainable…focusing on the impact on the environment, natural habitats and CO2." – Phase 3

"…keeping local habitats and see what happens when water gets abstracted" – Phase 3

Reflect customer wishes and expectations

"Trying to gauge customer expectations of business vulnerability…" Phase 1

"They have finite resources with difficult decisions to make that reflect government policy and the wishes of customers" – Phase 2

"Gain a general consensus on what people think should be a priority" – Phase 3

Potential costs and impacts of bills

"How much people are prepared to spend to get things fixed…" Phase 3

"What these plans are going to cost us as customers" – Phase 3

Views on WCWRG consulting customers

Overall, people thought it was a good thing that WCWRG was consulting customers about potential future plans for improving the water resource situation in the south west. Indeed, people were hopeful that their opinions would mean something and that the results would influence decision making, especially where there is a consensus on a number of issues.

"Hopefully it provides a fair balance of views for them to make the hard decisions" – Phase 1

"They're doing the survey for a reason to get customer feedback, so it should inform decision making" – Phase 1

"I tend to be a bit cynical, but I would it hope it plays a part and have some reassurance that it will…" – Phase 2

"I don't know, if a very high percentage think the same, they might do something with it, but no if not (a high percentage)" – Phase 2

"I would like to think a lot if there is really clear commonality, definitely; if it was 50:50, then no…" – Phase 3

"I hope it will have a big influence, that they will take most points of view into account a have a big impact" – Phase 3

There was one person who caveated his response around profits.

"I hope the responses will be taken into consideration, but time will tell; profit will play a role if it's too expensive" – Phase 3

Ease of survey completion

Generally, people found the survey fairly easy to understand and straightforward to complete. And, they felt the subject matter was something that resonated quite strongly and which they could engage with.

"…quite easy to think about once I got my head round the wide-ranging responsibilities they have" – Phase 2

"Very easy to engage with because we all use water, prices are going up everywhere, and the sustainability issues" – Phase 3

"Resonates with me living in the west country, and I'm doing my bit to help out" – Phase 3

The information provided on the showcards was clear, and crucially, it provided useful context to inform people's answers.

"…quite informative, lots information provided in order to understand the questions" – Phase 1

"The information was clearly laid out to help you understand the issues" – Phase 2

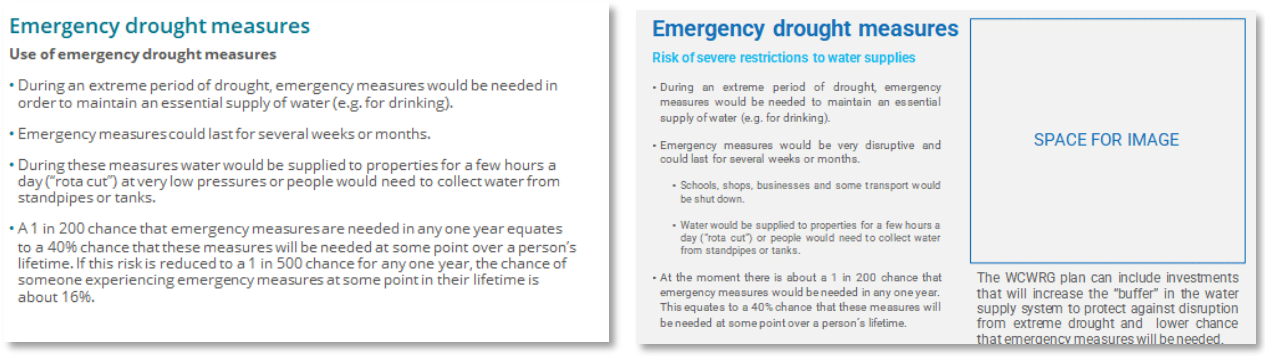
One or two people were challenged by the choice task, taking their time to ensure they had understood them correctly. Further details about completing the choice task are detailed below.

Different aspects of the regional resource

Overall, the information in this section of the survey was found to be clear, concise and easy to understand. For the first two phases (five interviews), the information was comprised of text only. In the last five interviews, the diagrams were added to make the information more appealing from a visual perspective. In total, there were six aspects of the plan presented to participants which will now be discussed in turn.

Improving the resilience of the system

For the first two waves of cognitive testing the question was constructed as 'how much do you think each of the following would impact on your life?' This related to the contextual information presented in Figures 1a and 1b below. Note, that in these first two stages the information was presented as 'emergency drought measures'. Following feedback from the first set of cognitive interviews where people were ambivalent towards some of the potential impacts of severe water restrictions, people often saying the restrictions would not have much impact, Figure 1b was used in the second set of interviews. This explained in more detail the potential disruption to schools, shops and businesses. It also explained that WCWRG could make the system more resilient against severe water restrictions.



Figures 1a & 1b - Emergency drought measures

Although the changes to Figure 1b helped with communicating the severity of the restrictions, people felt they could still tolerate the potential impacts to some extent. Part of the rationale was how people had managed through Covid-19 lockdowns and restrictions, and that if they can handle these, they can deal with restrictions to their water supply. Another reason for people's ambivalence was that people think that such *'restrictions are unlikely due to no impacts as a result of drought in recent years'*

Given that the full range of potential impacts was not communicated in the showcards (Figures 1a and 1b), a more detailed explanation in Figure 1c was used for the final set of interviews. As well as a visual representation of the potential impacts, more specific text was provided about household and non-household impacts; also, the focus moved from emergency drought measures to improving the resilience of the water supply system.

In addition to these showcard changes, the survey question was also altered to more adequately reflect real-life consequences on people's daily lives if severe water restrictions were introduced. Subsequently, in the final phase of interviews, people were more considered about how seriously they would be affected. And, there were differences by life stage; for example, the closure of schools and childcare services would not affect empty nesters.

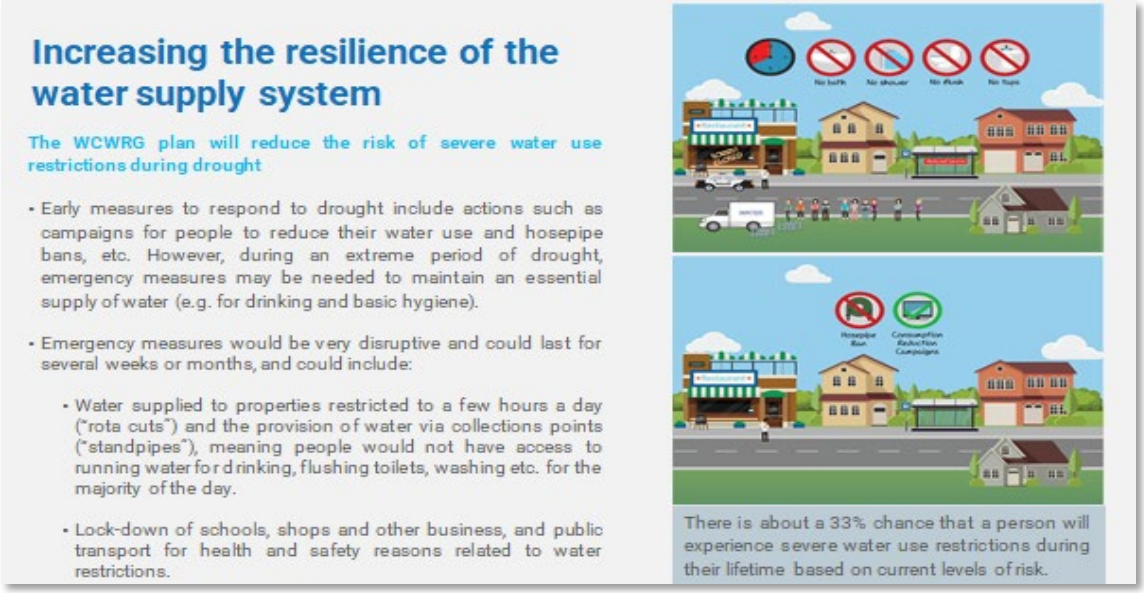
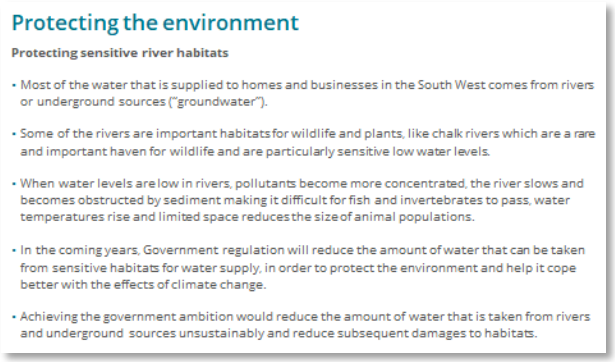
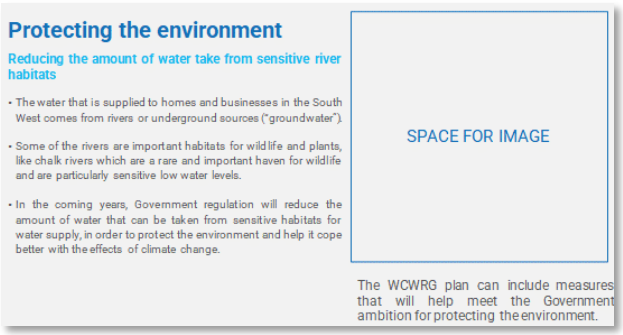


Figure 1c – Impact of severe water restrictions (3rd phase)

Protecting and improving the environment

In the first two phases of cognitive interviewing the emphasis of this attribute was about protecting the environment, improvement being added in for final stage of interviewing. The question utilised on this topic was a trade off between what was more important between '*protecting the environment by reducing water abstraction' or 'maintaining the water supply for people during a drought'.* To enable people to provide an informed answer, people were shown the information in Figures 2a and 2b. While broadly the same facts were presented, Figure 2b focused more on the impacts of water abstraction and what WCWRG could do to help protect the environment.





Figures 2a & 2b – Protecting the environment

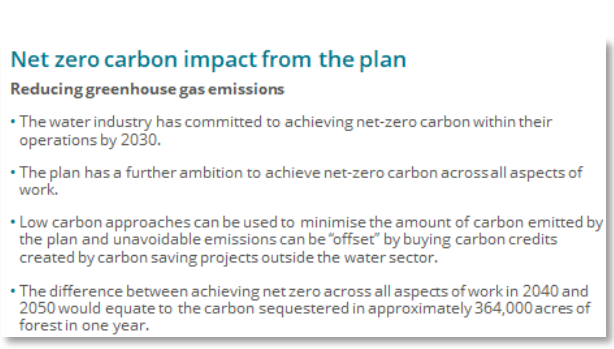
While people understood the trade-off question, it was considered too simplistic and too much of a binary choice. It was felt a third option was required which made allowance for how long the drought would go on for. For the third wave of interviewing however, the question was completely changed to utilise a Likert scale for various alternatives to protect the water environment. The statements resonated more with people and consequently, provided more meaningful information about people's priorities for protecting and improving sensitive habitats.

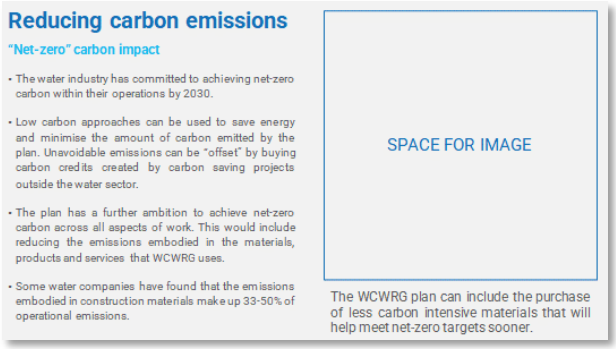
The information in Figure 2c was shown to participants to help people decide their answers. One of the key differences from the first two phases of interviewing was the introduction of biodiversity and its definition. Although people had some idea of biodiversity as a concept, they were not fully aware of what it involved, so the definition was very important. In addition, pictures were provided to show an unhealthy river environment versus a healthy one; these too, proved a helpful visual aid to communicate the difference.

Figure 2c – Protecting and improving the environment (3rd phase)

Reducing carbon emissions

In the first two phases of cognitive interviewing people were asked whether 'water companies should go beyond current commitments to meet carbon neutrality targets sooner than the current timeline'. The information provided to help people answer the question is shown in Figures 3a and 3b. While most people were able to answer the question quite comfortably, one felt that more facts were required.





Figures 3a & 3b – Carbon impact

For the last set of interviews, the question changed to elicit whether water companies should 'go beyond current commitments and invest in reducing their carbon emissions faster than current plans (even if it meant using resources that could be used to improve others services or reduce costs)'. Rather than providing an either / or answer, people were provided with a set of answers to ascertain the relative importance of reducing carbon emissions compared to investing in other priorities.

Figure 3c shows the information presented to people to help them decide on their relative priorities. This helped people understand how reducing carbon emissions ties in with protecting the environment, as well as the link to a potential increase in emissions to ensure a more resilient water supply system. Most said that while reducing carbon emissions was important, it was not the most important factor to consider.

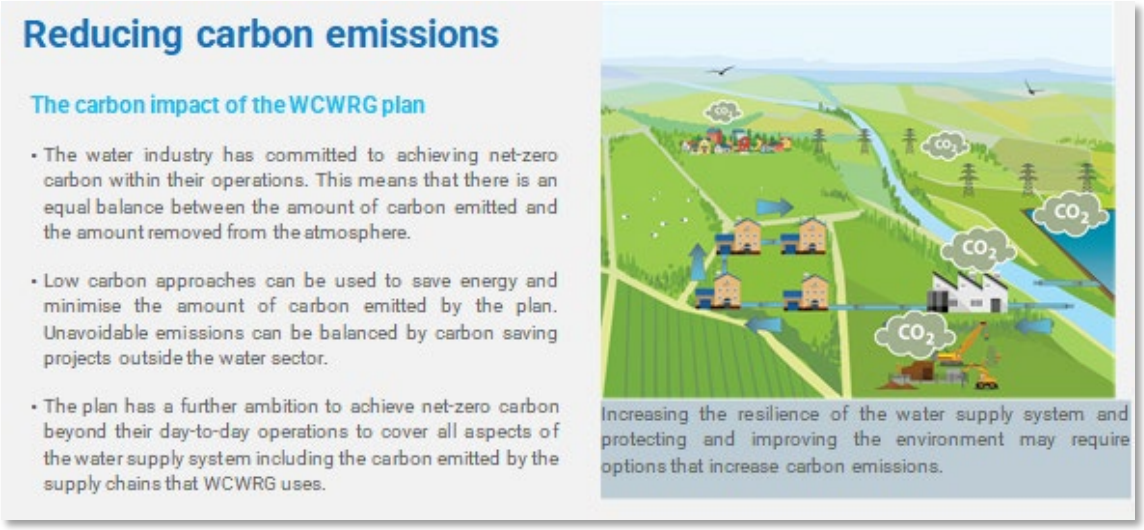
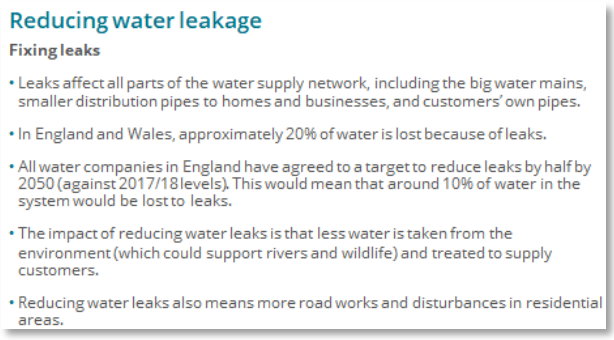
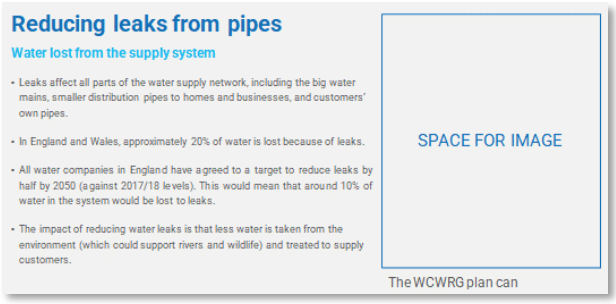


Figure 3c – Reducing carbon emissions (3rd phase)

Reducing leakage

All three phases of cognitive interviews utilised Likert scales to assess people's attitudes towards the level of leakage. fixing leaks and customers' responsibilities. The supporting information on reducing leakage in the first two phases is shown in Figures 4a and 4b, the main difference being the reference, in Figure 4a, to increased disruption in residential areas as a result of fixing leaks. In the third phase of interviews a more appealing showcard (Figure 4c) was presented to participants. As well as some of the information from the previous showcards, the information in Figure 4c went into more detail about leakage targets and the scale of work required to achieve zero leakage.





Figures 4a & 4b – Reducing water leakage

While people found the questions very straightforward to complete, the first two sets of cognitive interviews indicated that more leakage reduction should be carried out regardless of cost. Indeed, people didn't seem to make the connection between the considerable extra cost and disruption to them if they wanted more leakage reduction beyond the targets agreed already.

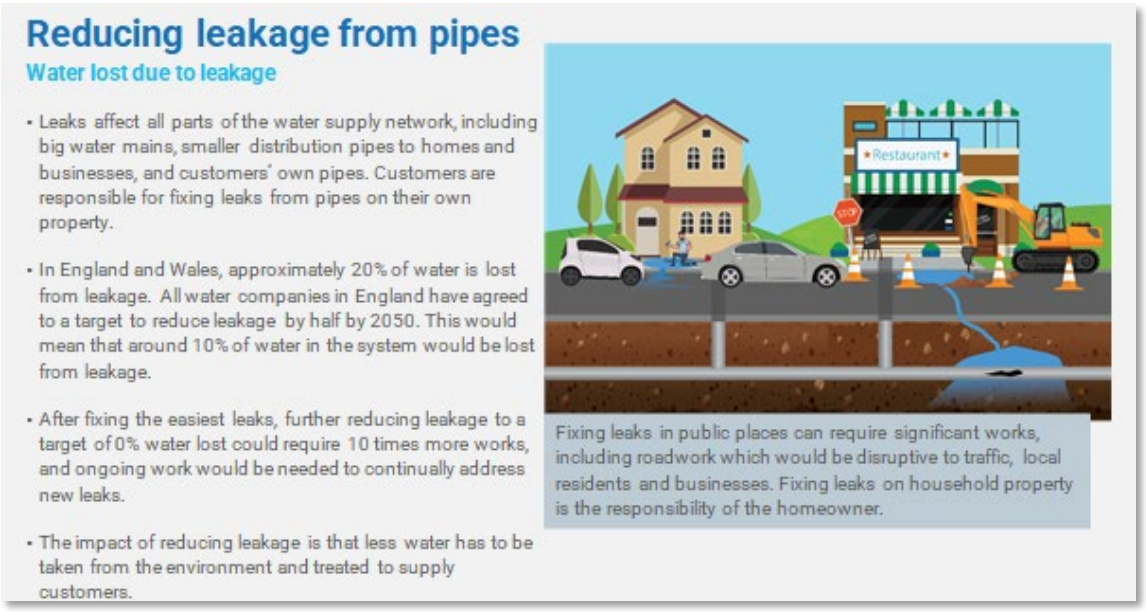


Figure 4c – Reducing leakage (3rd phase)

The information in Figure 4c seemed to elicit more considered responses, with people taking into account the likely levels of disruption and inconvenience. Some people still thought that the water companies should go further than the current leakage targets, justifying the extra cost and disruption as they perceived it would be more cost effective in the long run. However, this view was balanced against the reality that it is impossible to fix every leak.

"…not going to get rid of all leakage, not every leak is the same; do it smartly and fix those which cause the biggest impact" – Phase 3

"…nice to have zero leaks, but not do-able; there's always a crack and somewhere to fix" – Phase 3

To understand in more detail how people were thinking about leakage, people were asked in the debrief questions whether leakage was thought of in terms of a trade-off with disruptions and costs. Although people initially struggled to make the connection between a 50% leakage reduction and the significant increase in disruptions and costs, in retrospect they understood the likely road disruptions would be very frustrating. However, in the round, people still felt the benefits of investing in leakage reduction outweighed the disadvantages.

"It would be frustrating, but it's something we need to do and I would be prepared to put up with roadworks, plus if it means there's less impact on the environment, that's really important" – Phase 1

"…very used to it (roadworks), but we need to be making the effort because the volume of water saved will have a greater impact than the cost and repair of fixing leaks" – Phase 1

"It has to happen, the least money for a good job, but if it needs to done, so be it" – Phase 3

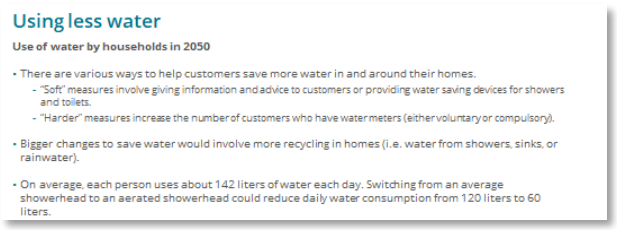
There were some caveats for people when answering this question which were centred on what information was available, as well as how much.

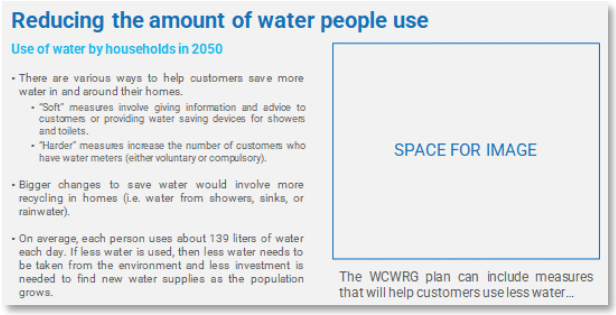
"There's so much missing information as an overriding aim…no reason for not having that balance between all the issues" – Phase 2

"As long as the information is good then I'm fine, it's going to be better in the end" – Phase 3

Reducing water usage

The final aspect of the water resource plan presented to customers was reducing customers' use of water. Contextual information (Figures 5a and 5b) was given to participants to help them understand the issues. In the first two rounds of testing, people were shown six statements and asked the extent to which they agreed or disagreed with them. Each statement was perfectly understandable and people had no issues with answering them.





Figures 5a & 5b – Reducing water usage

For the final set of cognitive interviews, the information shown in Figure 5c was provided to people. Much of the text provided was very similar as previous, such as average daily consumption and various ways to help reduce water usage, but more information was provided on customer behaviour. Furthermore, the title was softened to be more engaging, while the diagram provided visual appeal to show how customers could use less water.

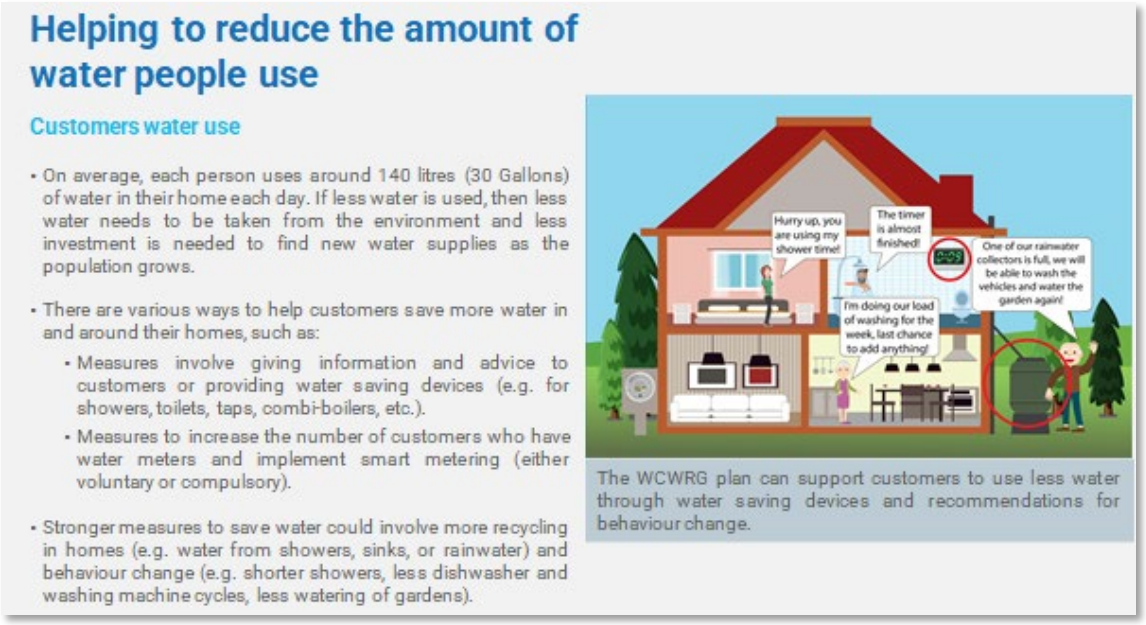


Figure 5c – Reducing water usage (3rd phase)

In the last phase of testing, eight statements were asked as opposed to six in the previous two phases. This was both to ensure broad coverage of all the pertinent issues, as well as taking account of the extra information provided in Figure 4c. It is also worth noting that some of the statements in the final phase were more nuanced and meaningful compared to the earlier phases, such as '*My household would be willing to install water changing devices or change our behaviour to save a little more water' (phase 3)* compared to *'My household would be willing to save a little more water' (phases 1 & 2);* or *'There is a need for everyone to do their part to use less water and reduce demand on the water supply system' (phase 3)* compared to *'There is a need for people to use less water' (phases 1 & 2).*

Regardless of which phase, people provided thoughtful and considered responses and were not just defaulting to what might be perceived as the obvious answer.

Choice task attributes

Prior to showing some example choice tasks, participants were asked to consider a number of attributes along with their definitions, which they would be trading off with each other. For the first two phases of testing the information in Figure 6a was presented.

Each of the attributes was fairly self-explanatory to respondents, although the wording around *'reducing dependency of water system on rivers and groundwater'* was perceived as being more complicated than it needed to be, as well as being somewhat inconsistent with what was presented in the earlier slide which was focused on 'protecting the environment'.

Attribute	Definition
Risk of emergency drought restrictions	The ability of the water system to withstand/endure the shocks associated with severe water shortages.
Reducing dependency of water system on rivers and groundwater	The government set ambition for the water system to reduce the amount of water taken from the environment to restore or maintain environmental health.
Carbon emissions reduction	The ability of the water system to deliver services whilst reducing the amount of greenhouse gas emissions released into the atmosphere.
Reducing leakage	Minimising the amount of water that is lost during the distribution of the water network through pipes.
Reduced water consumption	Reducing the amount of water used by individuals through behaviour change and efficiency improvements.
Cost	The hypothetical additional cost per year for your water services.

Figure 6a – Attribute definitions (1st & 2nd phases)

In addition to being fairly intuitive for people, the fact that they had already reviewed the information in the preceding part of the survey meant the attributes were all straightforward and easy to understand. Furthermore, the contextual information provided in the previous section was considered enough to inform people and enable them to make their choices.

"...yes, talking through these elements does feed you enough information provided you've read it" – Phase 1

"It's good to have the previous information at the beginning, it gave me a pictorial view as well" – Phase 3

For the third phase of cognitive of testing, the same attributes were shown to participants but the definitions were simplified, especially in terms of the *'protecting and improving the environment'* and *'reducing the carbon emissions'.* (Figure 6b). As such, all five participants thought the information in Figure 6b was very clear and easy to understand.

Attribute	Definition
Risk of severe water use restrictions during drought	The risk of needing severe water use restrictions during an extreme drought.
Protect and improve the environment	The level of action to reduce negative impact as well as protect and improve the environment, including biodiversity and benefits to people and communities.
Reducing carbon emissions	Reducing or balancing out carbon emissions while maintaining a reliable water supply.
Reducing leakage from pipes	Reducing the amount of water lost from pipes so that less water is required to be abstracted from the environment.
Helping to reduce the amount of water people use	Reducing the amount of water used at home by people through device installations and/or behaviour changes.
Cost	The permanent additional cost to consumer bills for water supply per household per year

Figure 6b – Attribute definitions (3rd phase)

Choice task - discrete choice experiment (DCE)

Clarity of instructions

Throughout the testing process, the majority of people found the instructions clear and easy to follow.

"It was straightforward and no problems choosing which was most important" – Phase 1

"…it was clear that I had to choose a first and second choice" – Phase 2

"Yes, providing you understand the attributes, it was fairly straightforward" – Phase 3

There was one person who was confused initially, thinking he had to compare each attribute individually across the three options. It was therefore worth re-iterating the need for people to trade one package of attributes with another.

Choice tasks

During the first two phases of testing, some example choice tasks like those in Figure 7a were presented.

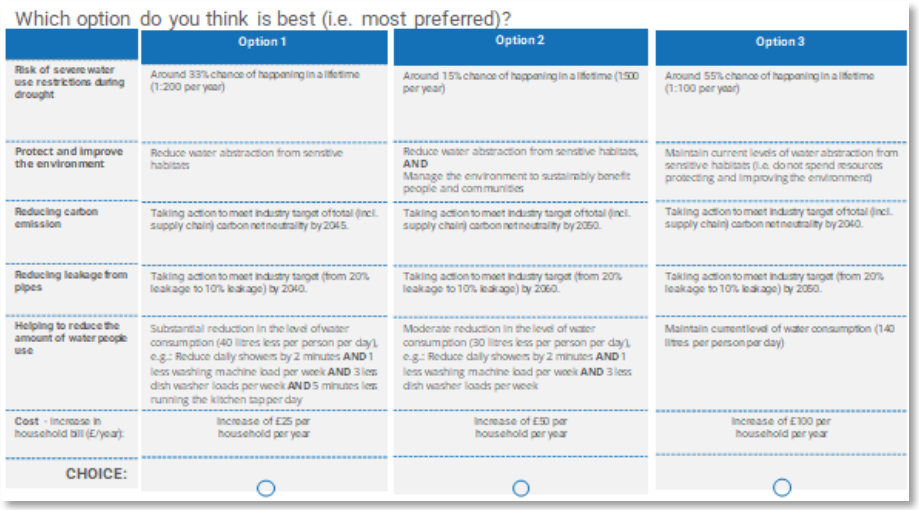
Which option do you think is best (i.e. most preferred)?

	Option 1	Option 2	Option 3
Risk of emergency drought restrictions – likelihood of emergency drought restrictions:	Around 40% chance of happening in a lifetime (1:200 per year)	Around 16% chance of happening in a lifetime (1:500 per year)	Around 80% chance of happening in a lifetime (1:100 per year)
Reducing dependency of water system on rivers and groundwater -	Achieving government ambitions	Doing slightly better than government ambitions	Doing slightly worse than government ambition
Carbon emissions reduction – achieve total carbon net neutrality by:	2040	2050	2035
Reducing leakage – achieve 50% leakage reduction by:	2030	2050	2040
Reduced water consumption -	Reduce by 25%	Reduce by 10%	Maintain current level of water consumption
Cost - impact on consumer bills	Increase of £14 per household per year	Increase of £18 per household per year	Increase of £10 per household per year
CHOICE:	○	○	○

Rollover: This cost is indicative of the change in water bills from the proposed plan. However, there are other aspects of water supply services that may increase your bills. All your household bills will also be affected by the rate of inflation each year.

Figure 7a – Example choice task (1st & 2nd phases)

In the last round of testing, the choices changed to reflect the revised wording and definitions of the attributes as shown in Figure 7b. One of the repercussions of these revisions was that the choice cards became much busier in terms of the amount of content. This was addressed subsequently by introducing rollovers that provided additional explanation for each attribute level.



Which option do you think is best (i.e. most preferred)?

	Option 1	Option 2	Option 3
Risk of severe water use restrictions during drought	Around 33% chance of happening in a lifetime (1:200 per year)	Around 15% chance of happening in a lifetime (1:500 per year)	Around 55% chance of happening in a lifetime (1:100 per year)
Protect and improve the environment	Reduce water abstraction from sensitive habitats	Reduce water abstraction from sensitive habitats, **AND** Manage the environment to sustainably benefit people and communities	Maintain current levels of water abstraction from sensitive habitats (i.e. do not spend resources protecting and improving the environment)
Reducing carbon emission	Taking action to meet industry target of total (incl. supply chain) carbon net neutrality by 2045.	Taking action to meet industry target of total (incl. supply chain) carbon net neutrality by 2050.	Taking action to meet industry target of total (incl. supply chain) carbon net neutrality by 2040.
Reducing leakage from pipes	Taking action to meet industry target (from 20% leakage to 10% leakage) by 2040.	Taking action to meet industry target (from 20% leakage to 10% leakage) by 2050.	Taking action to meet industry target (from 20% leakage to 10% leakage) by 2050.
Helping to reduce the amount of water people use	Substantial reduction in the level of water consumption (40 litres less per person per day), e.g.: Reduce daily showers by 2 minutes **AND** 1 less washing machine load per week **AND** 3 less dish washer loads per week **AND** 5 minutes less running the kitchen tap per day	Moderate reduction in the level of water consumption (30 litres less per person per day), e.g.: Reduce daily showers by 2 minutes **AND** 1 less washing machine load per week **AND** 3 less dish washer loads per week	Maintain current level of water consumption (140 litres per person per day)
Cost - Increase in household bill (£/year):	Increase of £25 per household per year	Increase of £50 per household per year	Increase of £100 per household per year
CHOICE:	○	○	○

Figure 7b – Example choice task (3rd phase)

Ease of completion

Most people found the choices straightforward to complete, some saying they were very easy. They understood what they were being asked to do in terms of choosing their preferred option.

"...pretty straightforward, although I tended to focus on the cost" – Phase 1

"Quite easy, I prioritised what I thought and then chose that consistently" – Phase 3

Sometimes it was a case of looking at them a couple of times to understand what was required.

"...fairly difficult to start with and then got easier because of repeating the process" – Phase 3

"I had to read it a couple of times to spot the difference" – Phase 3

There were some people who found the choices challenging, not because they didn't understand the concept, but because *'it was hard to decide what was most important';* also some felt there was a lot of information to assimilate in order to make informed choices. This was especially the case in the third phase where more information had to be considered and where some of the differences were perceived as quite small.

"The hardest part was the amount of information and then having to weigh up what was most important" – Phase 3

"The table format was logical and reasonable, but with 18 pieces of information, there's a lot to do" – Phase 3

"I think it was okay, but I can see why it might bamboozle some people" – Phase 3

With the added content in the third phase of testing, some participants also found some of the choices quite similar and therefore harder to pick out the differences. This was particularly the case with '*helping to reduce the amount of water people use*', where there were several different combinations of customer behaviour that had to be considered. Furthermore, in some attributes it was only the date that changed. To make it less onerous, it was suggested that the date be highlighted rather than reading the same text every time.

Overall, the choices made sense to people although in the earlier rounds of testing some people felt the ratio on '*severe restrictions*' was unnecessary. *Net neutrality* on carbon emissions was not clear and needed better definition and, it was felt the terminology of *slightly better / worse than government ambitions* (vis a vis protecting the environment) could be misinterpreted. Also, one person said it was not wholly clear what the government ambitions were. The revised attribute for *'protecting the environment*' meant that these uncertainties were removed allowing for a much clearer definition. Net neutrality was maintained for the third phase but with greater clarity about its meaning.

Trading behaviour

The way people were trading off their most and second most preferred choices would seem to confirm that people understood what they were asked to do in the choice task. A range of reasons were given for the various choice people made, and all of the attributes were considered in all choices, some to a greater extent than others. Indeed, lessening the chance of severe restrictions and protecting the environment were most frequently mentioned as most important.

General points

Water transfers

As part of the follow up questions to the choice tasks, people were asked to what extent they agreed with water transfers via a series of statements. In the first two phases of testing people were presented with two statements and then four in the last phase. Overall, participants were in favour of water transfers, with some caveats around cost and the ease of transportation.

"Yes, but not sure about the ease and expense of it" – Phase 1

"No problem, understand the mechanism of re-routing…." – Phase 1

"…absolutely, as a principle there's nothing wrong with it" – Phase 2

"…they already transfer, it's nothing new, but pumping water uphill is more ambitious" – Phase 3

As well as the possible cost and transportation issues, there were some caveats about people's water supply not being compromised by another region. There was a question relating to this in the survey where people were asked what assurances they would need to ensure water transfers were acceptable. In the first two phases of cognitive interviews the question was left as open ended, and people understandably wanted all the assurances. To provide more meaningful information therefore, people were asked to rank these assurances in the last phase of interviewing.

Bill impacts

A series of statements were asked about people's willingness to pay, as well as the affordability of future water bills. Participants provided a range of answers on the extent they agreed or disagreed with the statements indicating that the question and statements worked well. When asked how carefully people considered the bill impacts in the debrief questions, they understood that any investment needed to be paid for…

"I accept we've got to pay more…" – Phase 3

"…need to be proactive as it will be cheaper in the long term; prevention rather than cure and the latter will be more expensive" – Phase 3

…but there was a caveat in terms of how much the increase would be.

"£250 would be a substantial increase but £25 a year is not going to break the bank" – Phase 3

Altruism

As part of the debriefing questions in the cognitive interviews, people were asked whether they were thinking about the impact of the water resource plan on their household only or other households in the region. There was a broadly even split with people thinking about themselves…

"…more personal, things that I could influence myself" – Phase 1

"…my own household" – Phase 3

…and those who considered the wider impact on other households, businesses and organisations.

"…organisations and business, not just thinking about me" – Phase 1

"I would like to think I was thinking about society as a whole" – Phase 2

"The price might affect some more than others" – Phase 2

"Primarily my household, but also others in the local area" – Phase 3

"Impacts mostly on me, but some in the local area too…" – Phase 3

Survey credibility

There was unanimity that the both the survey general, and the choice tasks specifically were credible. This was due to the clarity of questions and the background information that was provided.

"What do people want and how much do they want to spend" – Phase 1

"There was a good range of information different areas…" – Phase 2

"It was in-depth enough to get people's true opinions" – Phase 3

And perhaps most encouragingly, it presented "some very real problems that we all have to think about".

Length of survey

Everyone thought the length of the survey was 'about right', 'absolutely fine' and 'not too long'.

"Fine, I didn't lose the ability to answer, and it didn't feel like you were reading pages and pages to get where you need to" – Phase 1

"It was reasonable, not too long…" – Phase 2

"Good length, not too long" – Phase 3

One person actually thought it was too short, feeling that they needed more time to take in all the information.

A1.4 Summary

Overall, the cognitive testing found that the survey worked well and was fit for purpose. People understood what was being asked of them and they had a good level of understanding of the various features of the regional plan. They also understood the choice task as well as being able to articulate clearly the reasons for their choices. Based on customer feedback, the changes described above were made to the survey as the cognitive testing unfolded, and final amendments were made prior to the pilot being launched.

Appendix 2 : Household survey

Appendix 2 - Household survey.pdf

Appendix 3 : Non-household survey

Appendix 3 - Non-Household surve

Appendix 4 : Onscreen layout

Appendix 4 - Onscreen layout.zip

Appendix 5 : Summary statistics

Appendix 5 - Summary Statistics.xls

Appendix 6 : Choice model estimations

Appendix 6 - Choice Model Estimations.xls:

Appendix 7 : Preference weights for best value planning

This appendix presents customer preference weights for use in best value planning, which requires weights for alternative planning criteria such as resilience, environment, leakage, etc. The weights are calculated from the choice model estimations in line with the analysis described in Section 5, using a linear model specification (see Appendix 6). Weights are combined from the separate household and non-household models according to the proportion of household customers (93%) versus non-household customers (7%) across the overall WCRWG customer base:

$$Combined\ customer\ preference\ weights_{ij} = 0.93 * HH\ Preference\ weight_{ij} + 0.07 * NHH\ Preference\ weight_{ij}$$

Where *i* represents the water company and *j* denotes the plan outcome or constraint from the choice model estimation. The respective customer base numbers are:

	Household (no.)	Non-household (no.)
Bournemouth Water	195.5k	14.1k
Bristol Water	512.5k	33.2k
South West Water	782.3k	70.9k
Wessex Water	577.7k	47.8k
Total	2,068.0k (93%)	166.3k (7%)
	2,234.3k (100%)	

The combined weights for best value planning (%) are:

	Preference weight calculation						Combined Weight (%)
	Household			Non-household			
	β	exp(β)	Weight (%)	β	exp(β)	Weight (%)	
Risk of severe water use restrictions during drought (1-in-100 – 1-in-500)	0.007	1.007	15.7%	-0.005	0.99	16.8%	**15.8%**
Protect and improve the environment (no action - enhanced)	0.212	1.237	19.3%	0.071	1.07	18.0%	**19.2%**
Reduce carbon emissions (2050)	-0.042	0.959	15.0%	-0.073	0.93	15.6%	**15.0%**
Reduce leakage from pipes (50% by 2050)	0.197	1.218	19.0%	-0.034	0.97	16.2%	**18.8%**
Help to reduce the amount of water people use (110l/p/d)	-0.001	0.999	15.6%	-0.002	1.00	16.7%	**15.7%**
Increase in bill from 2025	-0.017	0.983	15.4%	-0.008	0.99	16.6%	**15.5%**
Total	-	6.390	100.0%	-	5.970	100.0%	100.0%

Notes: see Appendix 6 for full model estimation results.

eftec
economics for
the environment

10F Printing House Yard, Hackney Road
London E2 7PR
+44 (0) 20 7580 5383
eftec@eftec.co.uk
eftec.co.uk
@eftecUK

Customer Research to Inform the Best Value Water Resource Plan for the South West – Wessex Water

Quantitative Research - Results

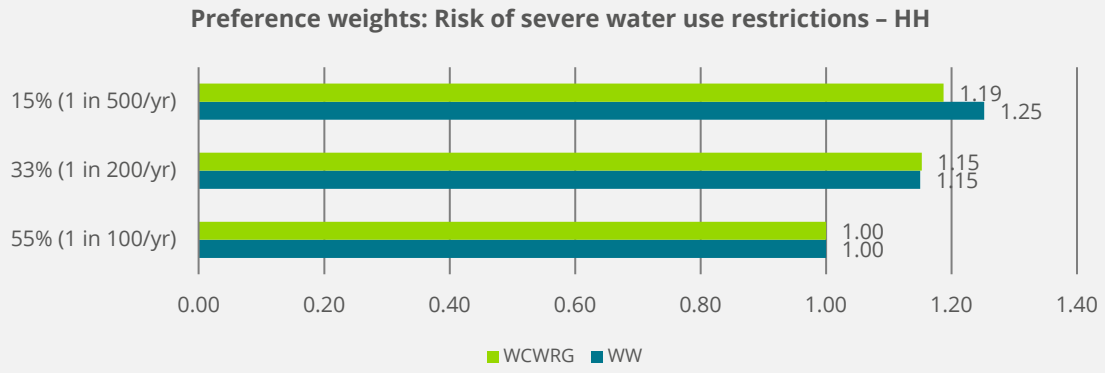
May 2022

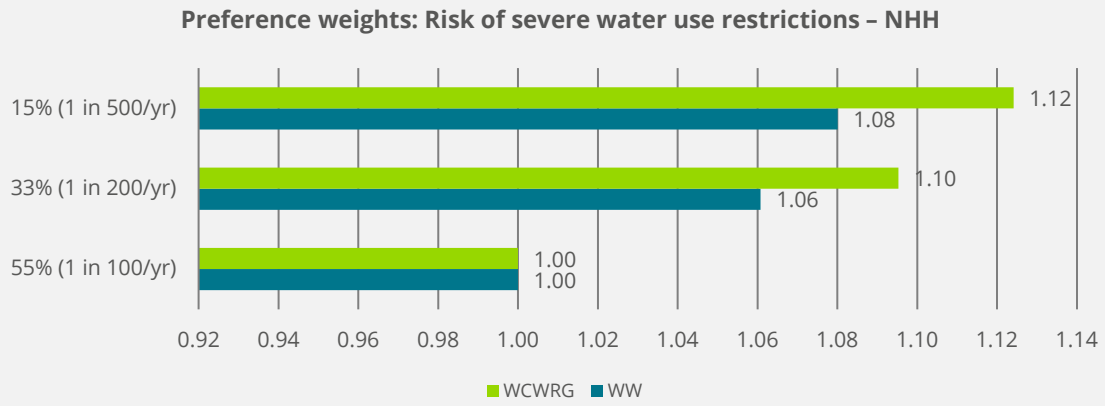
Main model estimations

Attribute	Level	Household (coefficient)	Non-Household (coefficient)
Risk of severe water use restrictions during drought	55% (1 in 100/yr) (base)	-	-
	33% (1 in 200/yr)	0.140***	0.059
	15% (1 in 500/yr)	0.225***	0.077
Protect and improve the environment	No action (base)	-	-
	Minimum action	0.155***	0.034
	Moderate action; biodiversity	0.315***	-0.030
	Moderate action; local communities	0.411***	0.003
	Enhanced action	0.393***	0.228**
Reducing carbon emissions	Achieve target by 2050 (base)	-	-
	Achieve target early by 2040	-0.018	0.019
Reducing leakage from pipes	Focus on other priorities (base)	-	-
	Achieve 2050 target	0.151***	0.023
Helping to reduce the amount of water people use	No reduction (base)	-	-
	Minor reduction	0.090**	0.106
	Moderate reduction	0.074*	0.165*
	Major reduction	0.084**	0.072
Increase in bill from 2025	Cost (linear)	-0.016***	-0.017***
No. observations	-	4059	747
Log-likelihood	-	-6620.54	-1293.36
Likelihood ratio $\chi 2$ (p-value)	-	0.000	0.000
Pseudo-R2	-	0.0895	0.0337

- The overall model estimation shows a good fit to the data given the respective sample sizes for household and non-household respondents.
- The cost variable has a negative and statistically significant coefficient. This indicated that the respondent are price sensitive and therefore their choices regarding the regional plan were constrained by the respective cost.
- In general, the household results (n = 492) are consistent with expectations and the main model estimations of the WCWRG pooled sample.
- Non-household results are limited due to sample size (n = 83) and should be interpreted with caution.

Preferences for reducing risk of severe water use restrictions



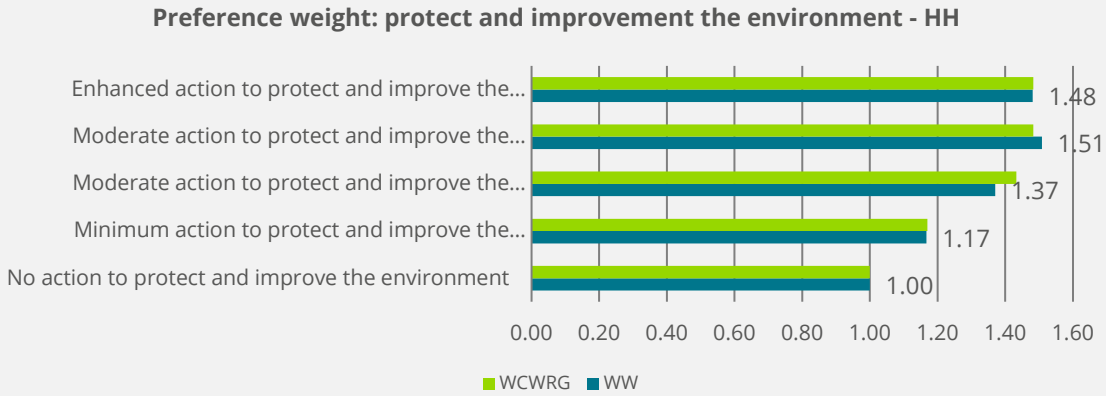


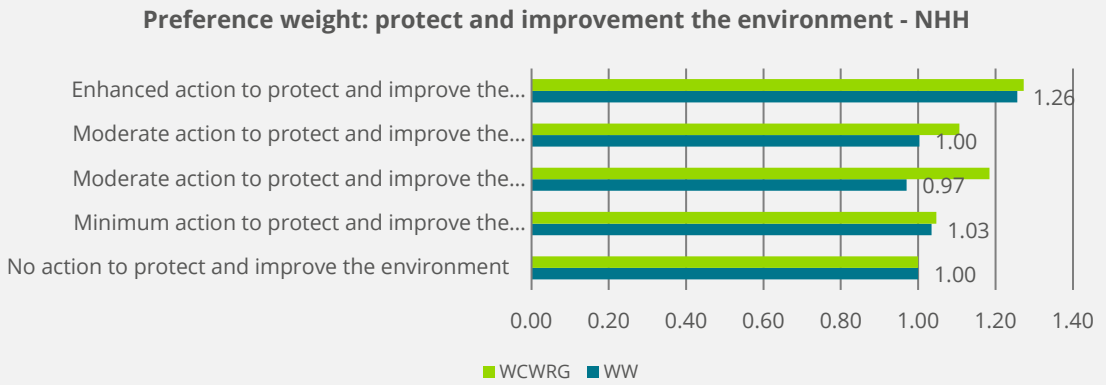
- Results for Wessex Water customers are similar to those for WCWRG overall, although HH respondents placed higher weight on reducing the risk of severe water use restrictions to 15% (1 in 500/year).
- NHH results shown for completeness, but sample size limits interpretation vs. WCWRG overall.

Interpretation of results

Preference weights are calculated "odds ratios" from the main model estimation. Here they can be interpreted as quantifying the relative strength of preference (i.e. priority) that customers assign to each attribute level. The odds ratios show the relative weight of the level compared to a 'base case' or reference point (e.g. 1.15x "better"). The base case has an odds ratio of 1: an odds ratio greater than 1 indicates that the level is preferred relative to the base; conversely an odds ratio less than 1 indicates that a level is not preferred relative to the base. The difference in odds ratio between each level shows the step changes (i.e. how much a level is preferred over another).

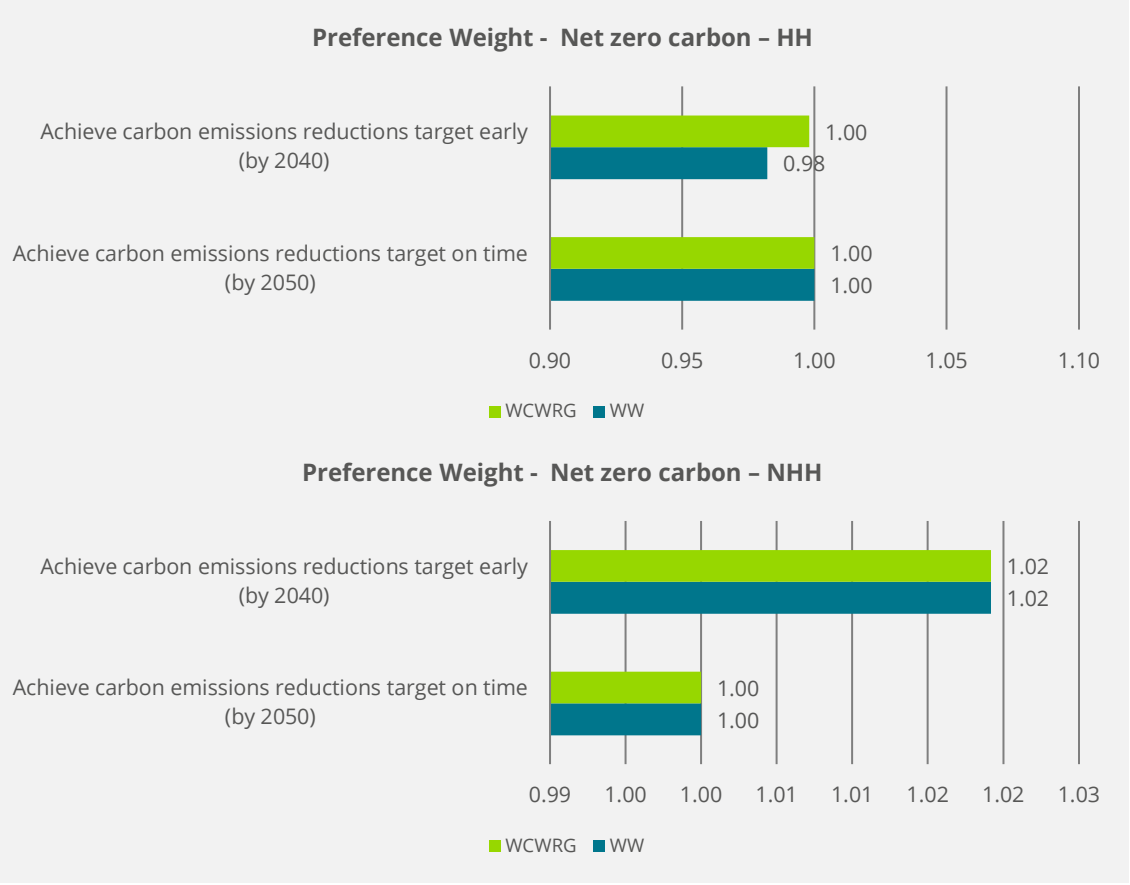
Preference for protecting and improving the environment





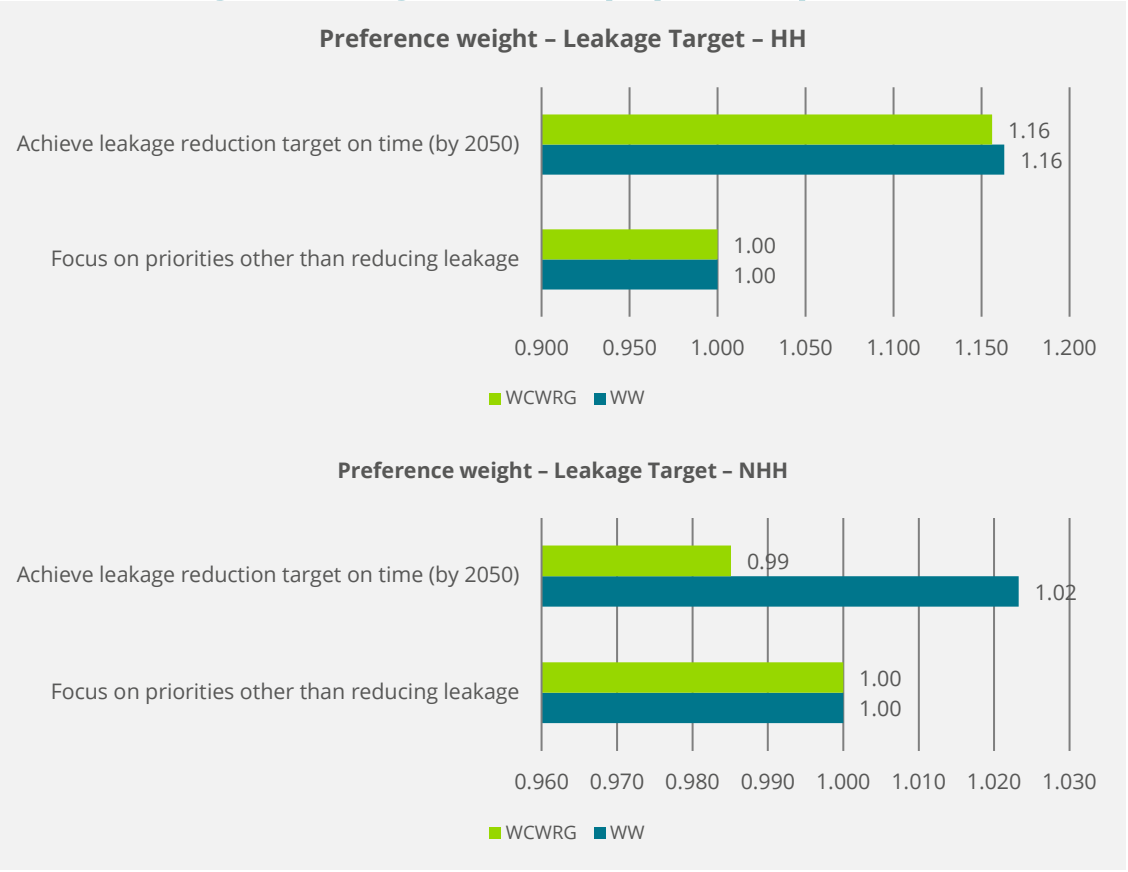
- In line with overall WCWRG result, Wessex Water customers prefer to go beyond the minimum level of action.
- Wessex Water HH respondents had a marginally stronger preference for actions to protect and improve the environment, with focus on local communities.
- NHH results shown for completeness, but sample size limits interpretation vs. WCWRG overall.

Reducing carbon emissions – preference weights



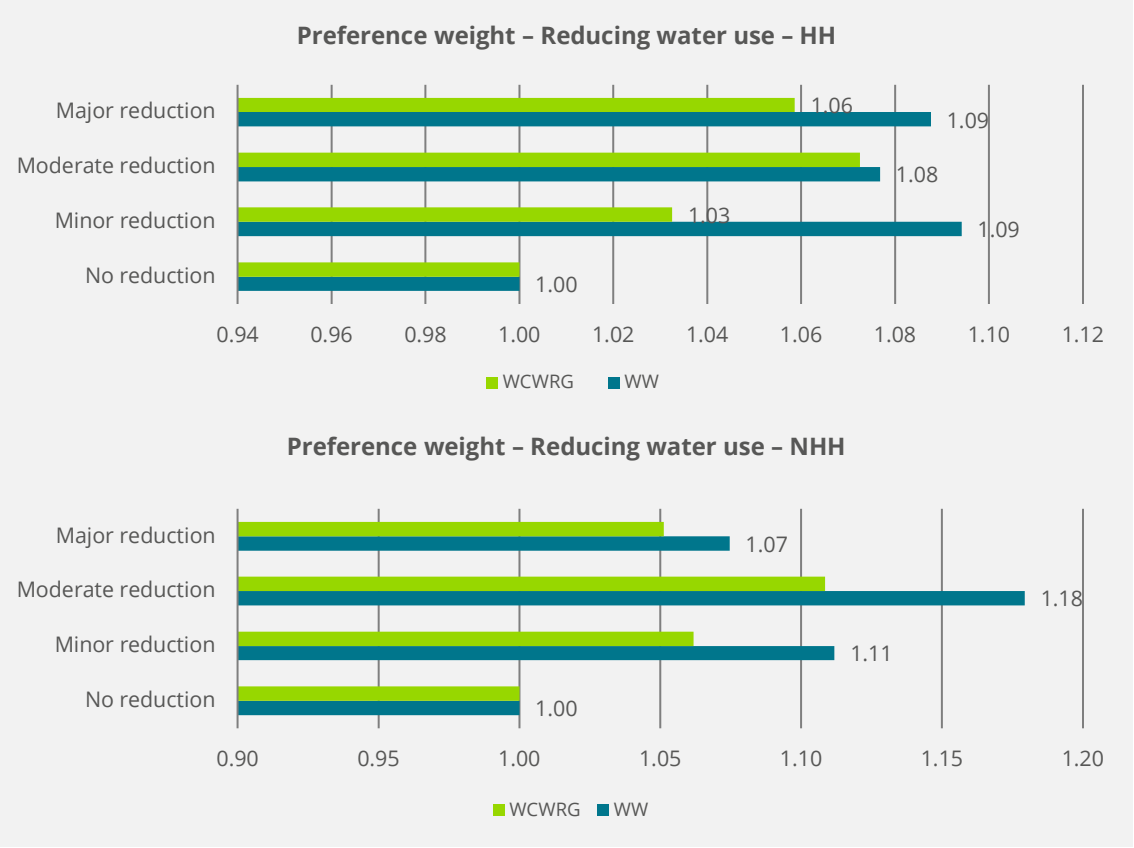
- Preferences regarding net zero are consistent with overall WCWRG result.
- NHH results shown for completeness, but sample size limits interpretation vs. WCWRG overall.

Reducing leakage from pipes – preference weights



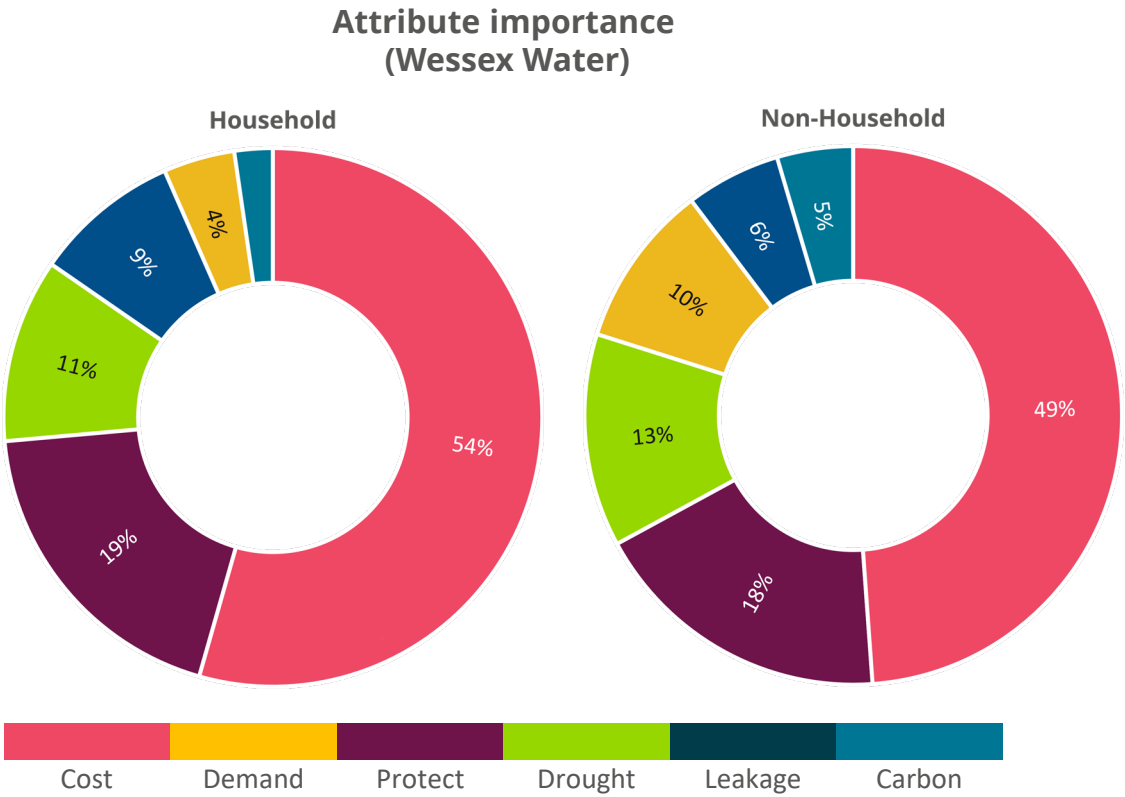
- HH results for Wessex Water are consistent with WCWRG overall and preference to achieve leakage reduction target on time (by 2050).
- NHH results shown for completeness, but sample size limits interpretation vs. WCWRG overall.

Reducing water use – preference weights



- Result for Wessex Water HH respondents places higher weight on minor reduction in use compared to WCWRG overall (but note there is limited distinction with higher levels of reduction).
- Non-household results shown for completeness, but sample size limits interpretation vs. WCWRG overall.

Attribute Importance



- Consistent with overall WCWRG result, impact on customer bill had the strongest influence on the choice of preferred regional plan.
- HH respondents placed around the same weight on environment (19%) compared to WCWRG overall and leakage reduction (9%).

Interpretation of results

"Attribute importance" shows how much weight respondents assigned to each attribute when making their choice; i.e. how important each attribute was in making a scenario more appealing.

Regional plan outcomes – customer willingness to pay (WTP)

Attribute	Level	HH – WCWRG (£/hh/yr)	NHH – WCWRG (%/nhh/yr)	HH – WW (£/hh/yr)	NHH – WW (%/nhh/yr)
Risk of severe water use restrictions during drought	55% (1 in 100/yr) (base)	-	-	-	-
	33% (1 in 200/yr)	8.92 (6.74 - 11.10)	4.90 (1.05 - 8.74)	8.78 (4.97 - 12.59)	3.42 (-4.52 - 11.36)
	15% (1 in 500/yr)	10.81 (8.62 - 13.00)	6.31 (2.40 - 10.22)	14.18 (10.28 - 18.08)	4.49 (-3.54 - 12.52)
Protect and improve the environment	No action (base)	-	-	-	-
	Minimum action	9.89 (6.88 - 12.90)	2.47 (-2.88 - 7.82)	9.74 (4.46 - 15.02)	1.96 (-9.13 - 13.05)
	Moderate action; biodiversity	22.68 (19.55 - 25.81)	9.07 (3.58 - 14.56)	19.80 (4.46 - 15.02)	- (-13.00 - 9.45)
	Moderate action; local communities	24.81 (21.63 - 27.99)	5.42 (-0.06 - 10.89)	25.86 (4.46 - 15.02)	- (-11.13 - 11.49)
	Enhanced action	24.83 (21.69 - 27.97)	12.99 (7.41 - 18.58)	24.73 (19.16 - 30.30)	13.29 (1.72 - 24.86)
Reducing carbon emissions	Achieve target by 2050 (base)	-	-	-	-
	Achieve target early by 2040	- (-2.02 - 1.74)	1.04 (-2.28 - 4.36)	- (-4.45 - 2.13)	- (-5.77 - 8.01)
Reducing leakage from pipes	Focus on other priorities (base)	-	-	-	-
	Achieve 2050 target	9.13 (7.22 - 11.04)	- (-4.14 - 2.55)	9.50 (6.13 - 12.87)	1.33 (-5.64 - 8.30)
Helping to reduce the amount of water people use	No reduction (base)	-	-	-	-
	Minor reduction	1.99 (-0.68 - 4.66)	3.22 (-1.55 - 8.00)	5.69 (1.00 - 10.38)	6.18 (-3.85 - 16.20)
	Moderate reduction	4.38 (1.70 - 7.06)	5.52 (0.76 - 10.29)	4.66 (-0.04 - 9.36)	9.61 (-0.45 - 19.66)
	Major reduction	3.59 (0.90 - 6.28)	2.70 (-2.05 - 7.46)	5.25 (0.51 - 9.99)	4.19 (-5.66 - 14.05)

- Wessex Water HH results follow a similar pattern to the WCWRG results.
- Main observed difference is higher value placed on minor reductions in water use compared to WCWRG overall.
- NHH results shown for completeness, but sample size means limited statistical significance of WTP estimates

Interpretation of results

WTP estimates are reported for the "step change" from the base level for an attribute – i.e. the benefit of moving from no reduction in PCC to minor reduction is £1.99/hh/yr (WCWRG result). The benefit of moving from a minor reduction to a moderate reduction is the difference between the respective WTP estimates – i.e. £2.39/hh/yr (= £4.38 – £1.99).