# SSC WRMP: MCDA

Quantitative Insights

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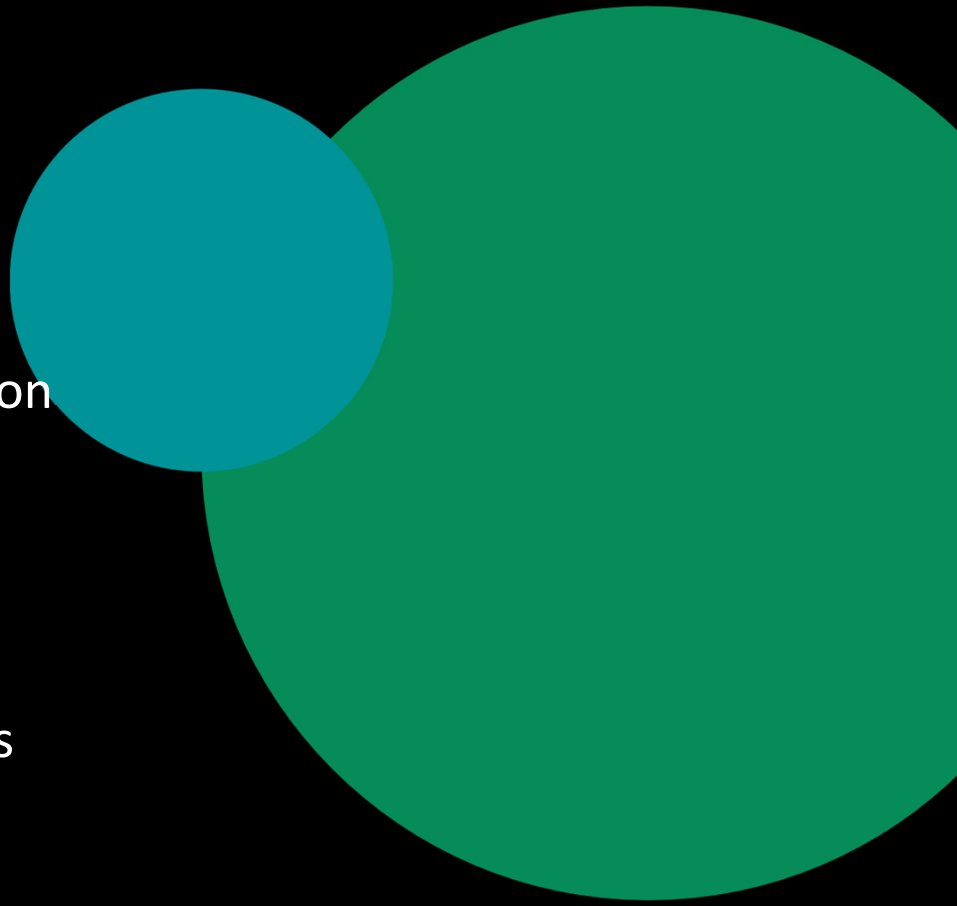

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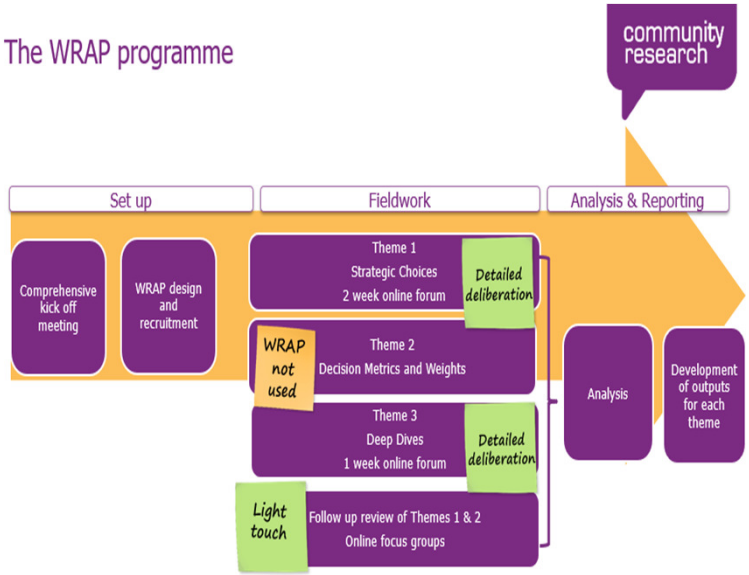
# Research Background

# BACKGROUND

SSC requires customer input to support the development of their draft WRMP24.

**ACCENT/PJM** developed a core programme based on four themes to support development of SSC's draft WRMP24. Work undertaken since has included a qualitative WRAP programme and two phases of quantitative work


## THEME 2: DECISION METRICS AND WEIGHTS – QUANTITATIVE STUDY

### THEME 2: PURPOSE

- Core purpose is to support development of a Best Value Plan via an MCDA process/ tool
- This involves selection of decision metrics to characterise plan alternatives, and development of weights to determine how those metrics should be balanced against one another in decision making
- These decision weights will be incorporated within the common WRW MCDA tool and the Cambridge Water MCDA model
- New weights will replace those derived via stakeholder workshop



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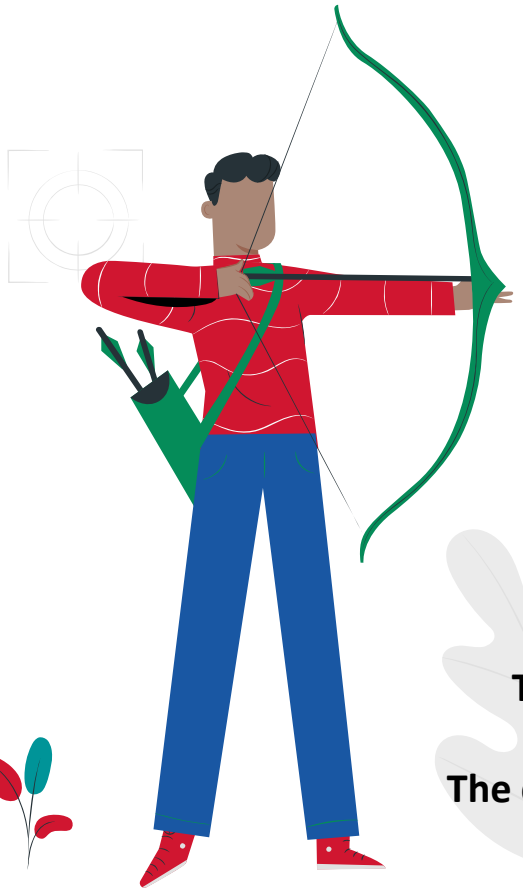
# OBJECTIVES

**QUANTITATIVE** study explored through stated preference choice exercises conducted with a representative sample of SSW and CAM customers



Explore customers' attitudes and views regarding the natural environment and SSC's approach to planning

Explore customers' ranking of SSC's water supply options to meet demand over the next 25 years

Explore customers' preferences for WRMP options to obtain weights for WRW MCDA decision metrics

**This chart pack illustrates our customer research process and quantitative insights**

**The quantitative phase was developed after an extensive qualitative process, the outputs of which were used to guide and shape the quantitative material development**



**Statistically signinfcant differences between customer populations are called out in the deck, where they exist.**

# Methodology and Sample

# Method: 1,015 online interviews: 570 with SSW and 445 in CAM

Quotas set to ensure sample is representative of customer base in each of the two supply areas – South Staffs Water and Cambridge Water
Final data set **weighted** according to targets. Minimum targets missed highlighted. Fieldwork conducted: 20th December 2021 to 4th March 2021

## Meter Status

| SSW | Target | Status |
|---|---|---|
| Metered | 239 | 265 |
| Unmetered | 331 | 271 |
| CAM | | |
| Metered | 274 | 297 |
| Unmetered | 106 | 96 |

## Gender

| SSW | Target | Status |
|---|---|---|
| Female | 291 | 275 |
| Male | 279 | 215 |
| CAM | | |
| Female | 190 | 196 |
| Male | 190 | 193 |

## Social Grade

| SSW | Target | Status |
|---|---|---|
| AB | 97 | 136 |
| C1C2 | 291 | 203 |
| DE | 182 | 129 |
| CAM | | |
| AB | 133 | 151 |
| C1C2 | 182 | 121 |
| DE | 65 | 100 |

## Age

| SSW | Target | Status |
|---|---|---|
| 16-34 | 108 | 92 |
| 35-49 | 171 | 124 |
| 50-64 | 143 | 147 |
| 65+ | 148 | 127 |
| CAM | | |
| 16-34 | 68 | 49 |
| 35-49 | 118 | 82 |
| 50-64 | 103 | 122 |
| 65+ | 95 | 139 |

## Bill Payer Status

| Total | Target | Status |
|---|---|---|
| Bill payer | n/a | 965 |
| Non payer | n/a | 33 |

## Sample Source

| SSW | Target | Status |
|---|---|---|
| Panel | 300 | 281 |
| SSC | 300 | 312 |
| CAM | | |
| Panel | 200 | 190 |
| SSC | 200 | 281 |

## Type

| Total | Target | Status |
|---|---|---|
| HH | n/a | 887 |
| NHH | n/a | 128 |

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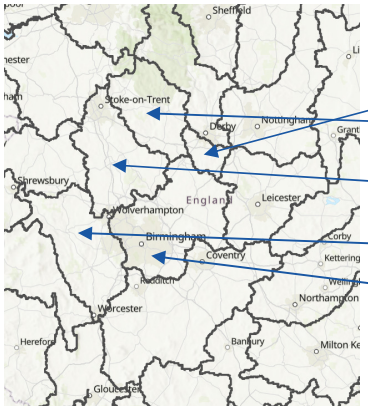
# Method: 1,015 online interviews: 570 with SSW and 445 in CAM

## Catchment Area

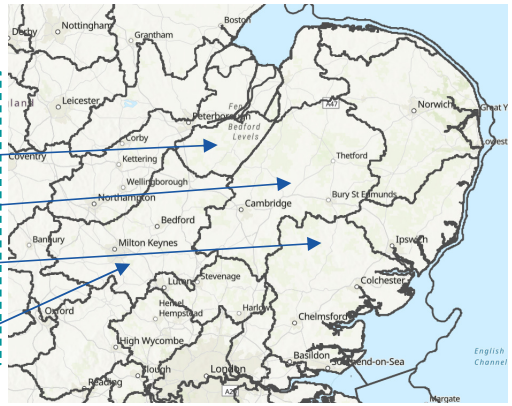



SSW catchment completes:

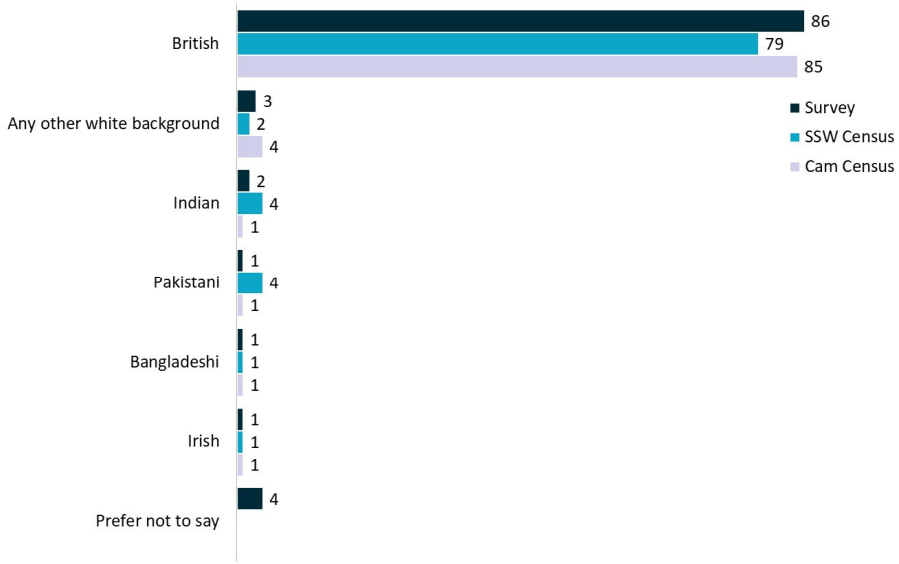
- Dove: 18
- Trent Valley Staffs: 68
- Lower Trent & Erewash: 6
- Severn Middle Worcs: 71
- Tame Anker & Mease: 243

CAM catchment completes:

- Upper & Bedford Ouse: 46
- Cam and Ely Ouse: 239
- Combined Essex: 2
- Old Bedford & Middle Level: 36




## Ethnicity




## Quality checks:

- Minimum completion time imposed
- Minimum time to review information and descriptions
- Straightliners removed
- Logit checks

## Follow ups:

- 15% opted in to H2Online signup
- 63% requested a summary of results

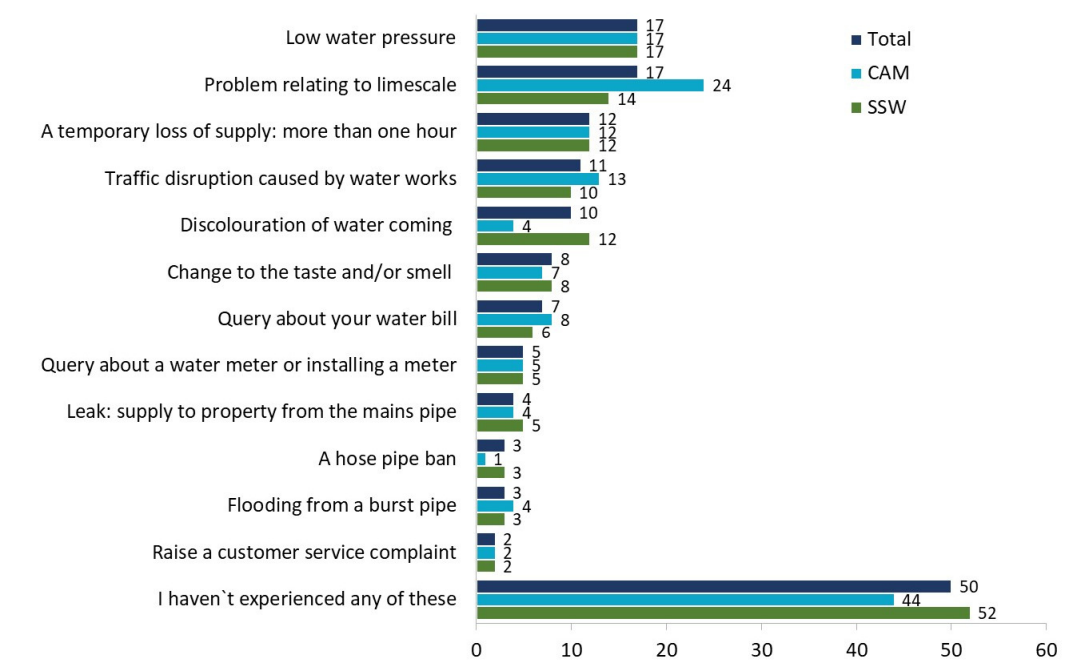
# SAMPLE CHARACTERISTICS

# SERVICE ISSUE EXPERIENCE/VULNERABILTIY

All participants completed the survey online – a mix of SSC supplied customer sample and from commercial panels

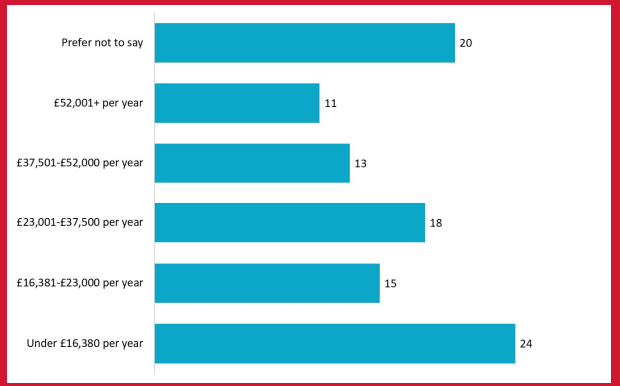
## SERVICE ISSUE EXPERIENCE

50% had some form of service experience over the last 2 to 3 years
49% HH and 51% NHH

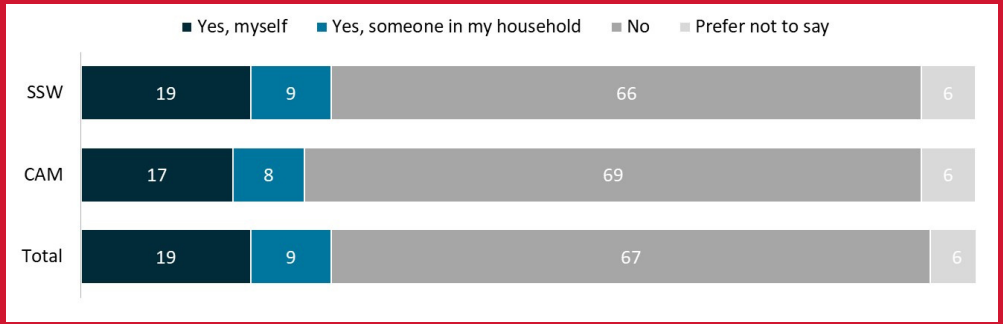



## VULNERABILITY: 40% OF TOTAL SAMPLE

- 24% live in a household with an annual income under £16,380 pa
- And 12% of the sample live in a household where someone is on the SSC PSR




Approx. one in three live in a household where one or more person is in receipt of benefits



# Due to the impacts of COVID pandemic at the time of the research, an additional 20 depth interviews were conducted to replace the planned 100 face to face quantitative interviews

## Fieldwork timings

- Fieldwork was conducted at a time when Plan B Covid-19 restrictions were announced
- Fieldwork was conducted during a period of bad whether in December 2021
- The online interview length averaged over 20 minutes meaning a face to face interview length was estimated at over 30 minutes
- These factors made face to face fieldwork difficult
- The planned 100 face to face interviews were replaced with a higher number of online interviews……
- ……. and a small number of depth interviews with customers from groups less likely to be represented through an online approach:
  - Those in the highest age groups
  - Those in social group E
  - Those from non-white ethnic groups
  - Those who are digitally disengaged

## Interviews Achieved

- 8 interviews with those over the age of 70
- 4 interviews with those from Asian ethnic groups
- 3 interviews with those from Caribbean/African ethnic groups
- 8 interviews with those from social group E
- 3 interviews with those who are digitally disengaged

- Note: numbers add up to more than 20 as some participants fell into more than 1 group.

## Qualitative feedback from the 20 depth interviews:

## Views from the depth interviews broadly reflect the quantitative sample findings. For a majority cost was at fore-front of customers' mind, they are aware of the importance of protecting the environment and a sustainable future

A qualitative majority of the 20 customers interviewed indicated that they are conscious about the environment and the future. However, only a few showed spontaneous concern about the levels of water in their regions or the lack of water

Despite the cost pressures felt by the majority of the qualitative sample, there was a willingness to pay slightly more for solutions that help address water surety whist also having a positive environmental impact

Very few were prepared to opt for solutions/options that delivered the lowest bill impact, but were damaging towards the environment

*I don't have money to throw away, but if I have to pay £32 more for something, I want to pay for something good.*

*So much out there killing our wildlife, we gotta do what we can to limit it (even if it means paying more)*

*You need to focus on major impacts to water quality and rivers - this all builds into damages to the environment. Emissions need focus on but less so from a water company, instead they should focus on water.*

*Price is most important to me but I am willing to pay more if it means better water quality for people's health.*

# SATISFACTION, TRUST AND VALUE MONEY
# CUSTOMER PERCEPTIONS

## OVERALL SATISFACTION: MEAN = 7.77
**NO SIG DIFFERENCES**


7.77

- Overall satisfaction scored 0 to 10 where 0 = extremely satisfied and 10 = extremely satisfied
- C-Sat = 7.44 (online sample)
- Priorities = 7.91

## TRUST
**NO SIG DIFFERENCES**


7.79

- Trust scored 1 to 10 where 1 = I don't trust them at all and 10 = I trust them completely
- C-Sat = 7.47 (online sample)
- Priorities = 8.15

## SATISFACTION WITH VALUE FOR MONEY: MEAN = 4.04
**METERED SIG MORE LIKELY TO RESPOND "4" COMPARED TO UNMETERED – 40% CF 29%**
**65+ SIG MORE LIKELY TO RESPOND "5" THAN 18-34 – 47% CF 28%**

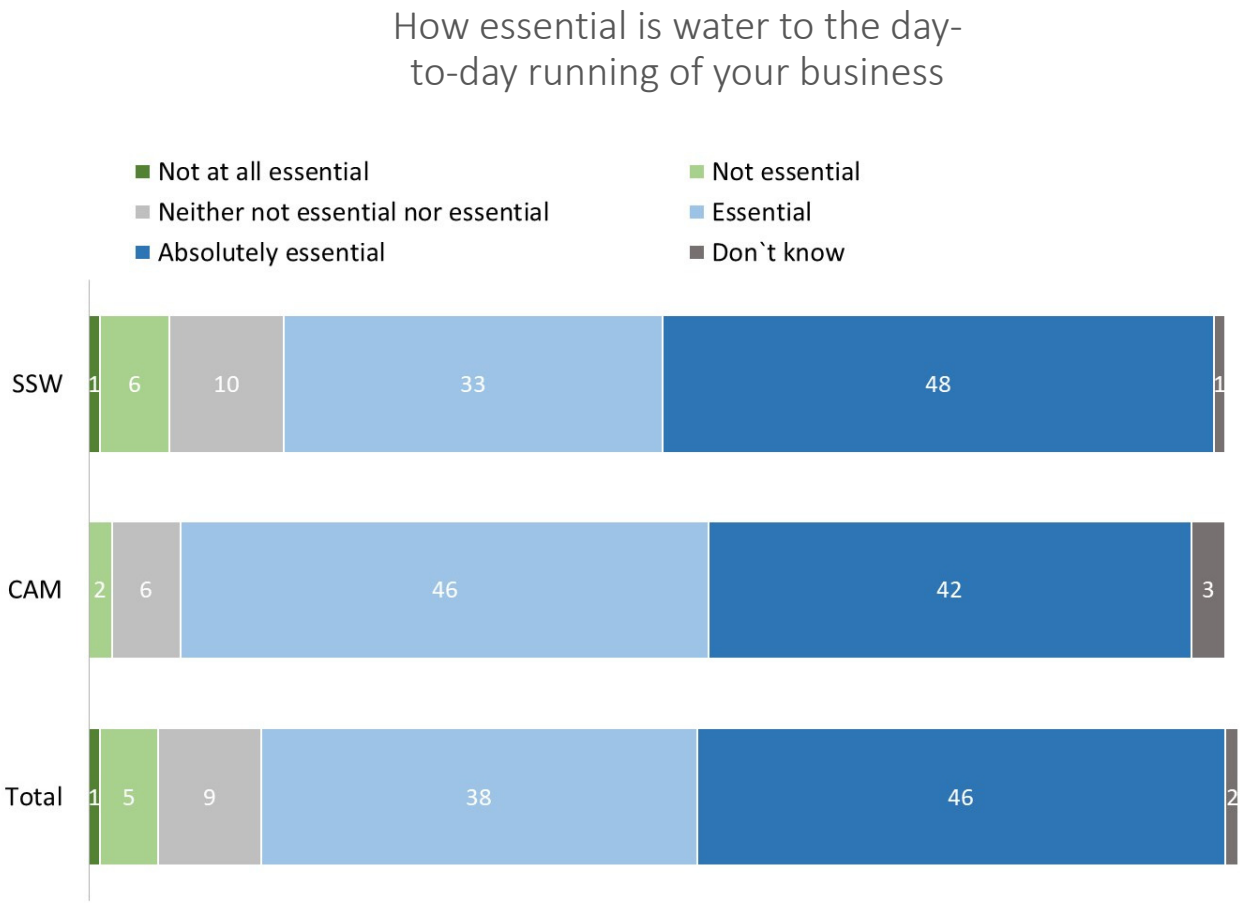

4.04

- VFM scored 1 to 5 where 1 = very dissatisfied and 5 = very satisfied
- C=Sat = 3.59 (online sample)
- Priorities = 3.95

**LOW TRUST/SATISFACTION** → **HIGH TRUST/SATISFACTION**

## **BUSINESS PROFILE:** Overall 128 interviews, 76 for SSW, 52 for CAM

## Majority of NHH participants state that water is essential to the day to day running of their business. More so in CAM than SSW (although this difference is not statistically significant)




| Number of employees | ONS % | Survey % |
|---|---|---|
| 1-49 | 34.2 | 26 |
| 50-249 | 13.8 | 11 |
| 250-499 | 5.5 | 6 |
| 500+ | 4.6 | 41 |
| DNA | | 16 |

| Sector | % |
|---|---|
| Health and social work | 15 |
| Education | 14 |
| Retail, Wholesale, Motor Trades | 10 |
| Professional, scientific and technical activities | 9 |
| Government and Defence | 7 |
| Construction | 6 |
| Transport and Storage | 6 |
| Hotel, catering, Camp sites, restaurants, cafes, accommodation, pubs | 4 |
| Information, Telecommunications | 3 |
| Utilities and Energy | 2 |
| Banking, Finance, Insurance | 2 |
| Business Admin and support services | 2 |
| Other service activities | 2 |
| Agriculture, forestry and fishing | 1 |
| Mining, quarrying | 1 |
| Food, Drink and Tobacco Manufacturers and Other Manufacturing | 1 |
| Arts, Recreation, Entertainment | 1 |

Due to the difficult nature of collecting business responses (they are less engaged than HH), we have accepted the natural fall out of the sample, which is not in line with ONS data. NHH recruited via carefully targeted screening questions from online panels and SSC's household database. Of the 128 completes – 56 came from SSC supplied sample and 72 from commercial panels.

ONS % does not equal 100% as sole traders excluded.

Q61. How essential would you say the supply of water is to the day-to-day running of your business? (n=128)

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# Executive Summary

# Executive Summary

## Context:

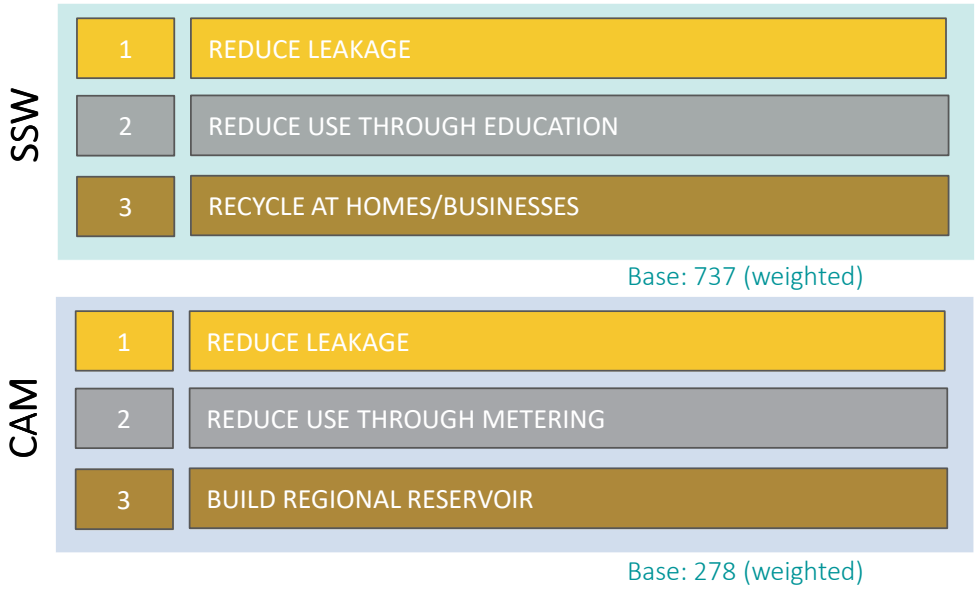
- The research was undertaken at a time of uncertainty:
  - The CV-19 pandemic was entering a second winter with Plan B restrictions announced
  - Customers were beginning to feel the impact of rapid increases in gas and electricity prices
  - Prominent news stories about CSOs pollution incidents
  - COP26 summit in September 2021

  - These issues may have had an impact on participants' views – for example CSO activity could decrease customers' trust in water companies and COP26 news could increase customers' carbon valuations given the prominence of the summit.

- Results from this study suggest that customers are engaged with and concerned about the environment/climate change, BUT they are also concerned about the impact of the cost of living crisis
- In response to planning balances, customers in the South Staffs region lean more towards keeping bills as low as possible for customers compared with customers in the Cambridge region.

# Executive Summary

## 1. Supply-demand option preferences




➢ Leakage reduction most preferred option type for both SSW and CAM, but other differences emerged between regions.

## 2. Decision metric weights

- CAM customers had higher valuations compared to SSW customers
- Carbon emissions weights substantially higher for both SSW and CAM customers than the original SEA and NCA values
- Ecosystem resilience/habitats weights lower for both SSW and CAM customers than the original SEA and NCA values (substantially so for SSW)
- For SSW customers, weights for flood risk and human & social wellbeing in line with NCA, weight for multi-abstractor benefits in line with SEA
- For CAM customers, weights for flood risk higher than SEA and NCA, weights for human & social wellbeing and multi-abstractor benefits in between SEA and NCA values

➢ Metric weights delivered in a form that can be used directly in WRW ValueStream tool for selecting Best Value options.

**Good levels of content and construct validity found, and good statistical models, hence results are meaningful and reliable.**

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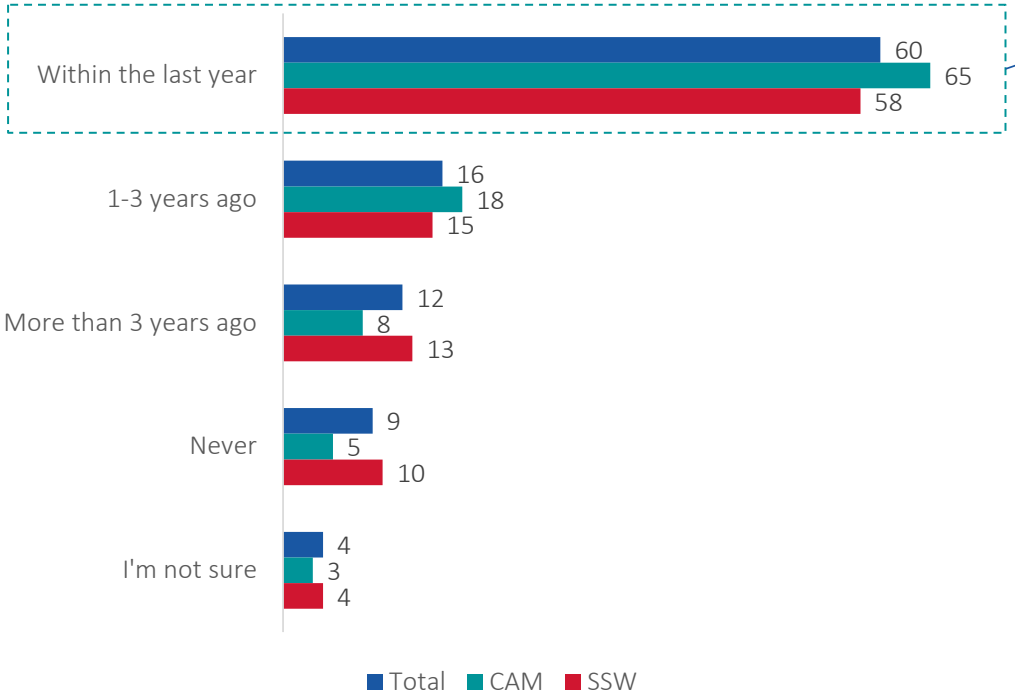
# Planning Balances and Environment Consideration

# 6 in 10 visit rivers, lakes or reservoirs in the last year. This figure is significantly higher among Cambridge customers (65%)

When you last visit rivers, lakes or reservoirs in your area for recreational purposes

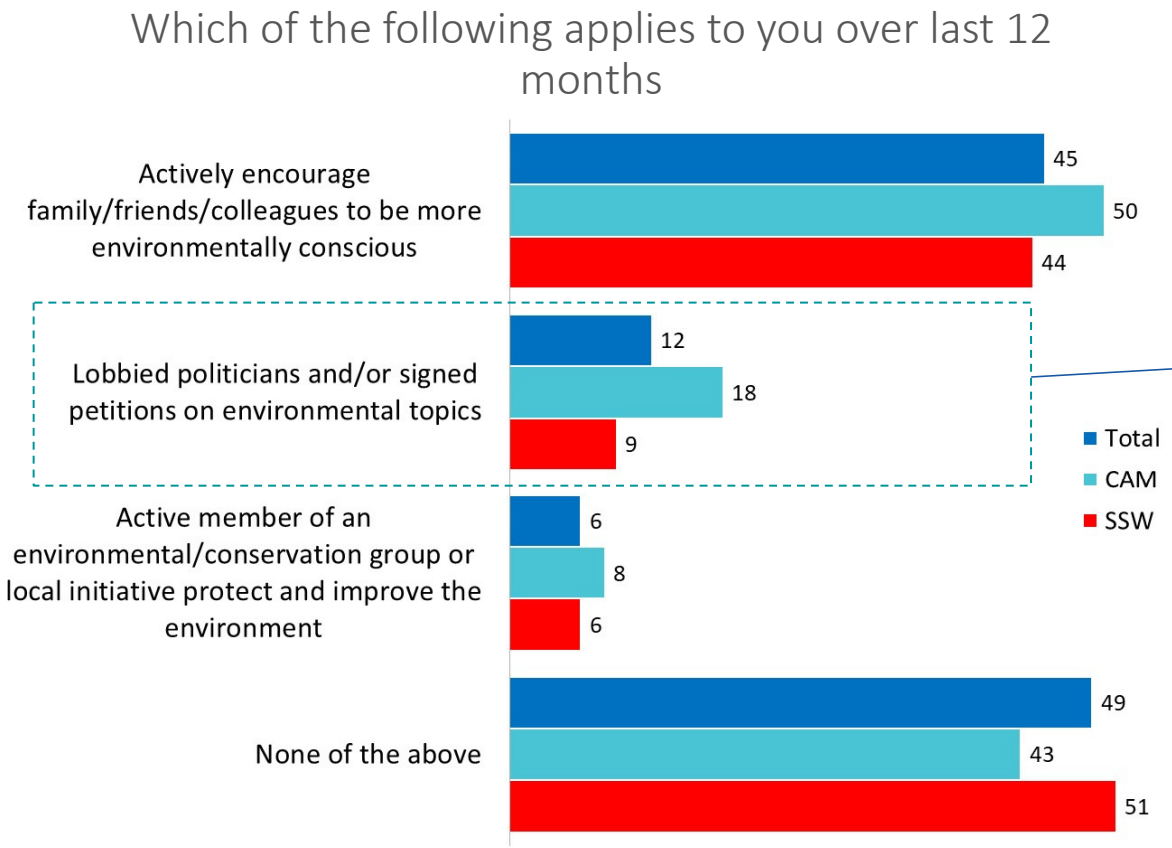



**Within the last year** - Sig higher among:

- CAM (65%)
- Cam & Ely Ouse (70%), Trent Valley Staffordshire (75%)
- Bill payers (58%) when compared to non bill payers (39%)
- NHH (74%) when compare to HH (58%)
- AB (69%) & C1C2 (59%) when compared to DE (48%)

Q29. When did you last visit rivers, lakes or reservoirs in your area for recreational purposes e.g. walking, cycling, fishing, (n=1015)

# Over half of all customers claim to be actively involved in some type of environmental activity




**Lobbied politicians and/or signed petitions on environment topics** - Sig higher among:

- CAM (18%)
- Younger – 18-34% (19%)
- Females (14%)

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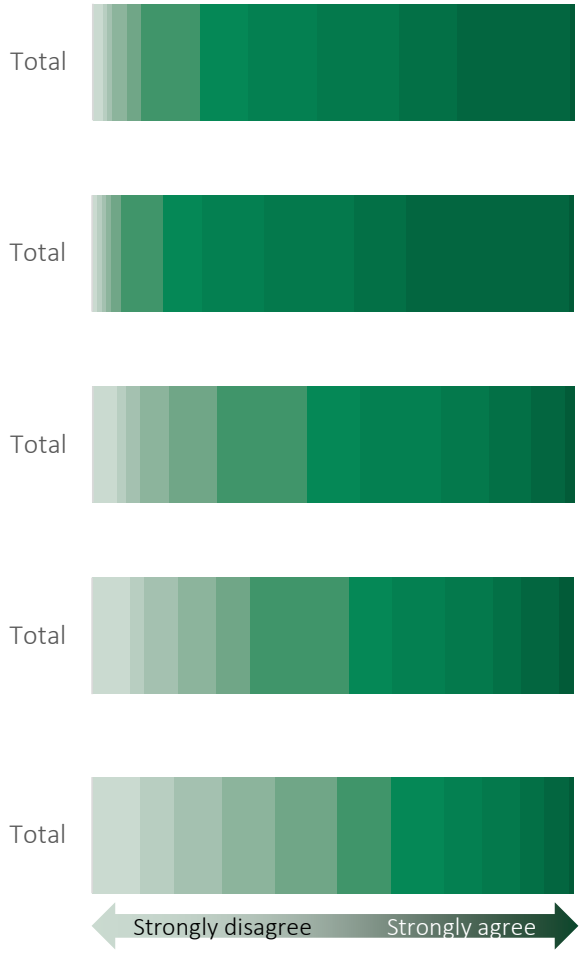
Q52. Which of the following statements applies to you over the last 12 months? (n=887)

# The local environment – both the impact of climate change and protecting lakes/rivers etc – are important to the majority of customers

*I am concerned about the impact of climate change on the natural environment in my area*




| | Total | CAM | SSW |
|---|---|---|---|
| Top 3 box | 52% | 61% | 48% |
| Mean score | 7.3 | 7.8 | 7.1 |

Sig higher in CAM

*Protecting lakes, rivers, reservoirs, fish and other aquatic plants and wildlife is really important to me*

| | Total | CAM | SSW |
|---|---|---|---|
| Top 3 box | 64% | 70% | 63% |
| Mean score | 8.0 | 8.3 | 7.9 |

Sig higher in CAM

*I do more to save energy than I do to save water in my home**

| | Total | CAM | SSW |
|---|---|---|---|
| Top 3 box | 26% | 20% | 28% |
| Mean score | 5.8 | 5.3 | 6.0 |

Sig higher in SSW

*I worry about the amount of water available for use in my local area*

| | Total | CAM | SSW |
|---|---|---|---|
| Top 3 box | 24% | 28% | 22% |
| Mean score | 5.3 | 5.7 | 5.2 |

Sig higher in CAM

*I don`t think much about saving water, I just take it for granted really**

| | Total | CAM | SSW |
|---|---|---|---|
| Top 3 box | 18% | 17% | 20% |
| Mean score | 4.6 | 4.1 | 4.7 |

Sig higher in SSW

Q30. How much do you agree or disagree with the following statements:(n=1015) (* - Online Panel only , n= 503)

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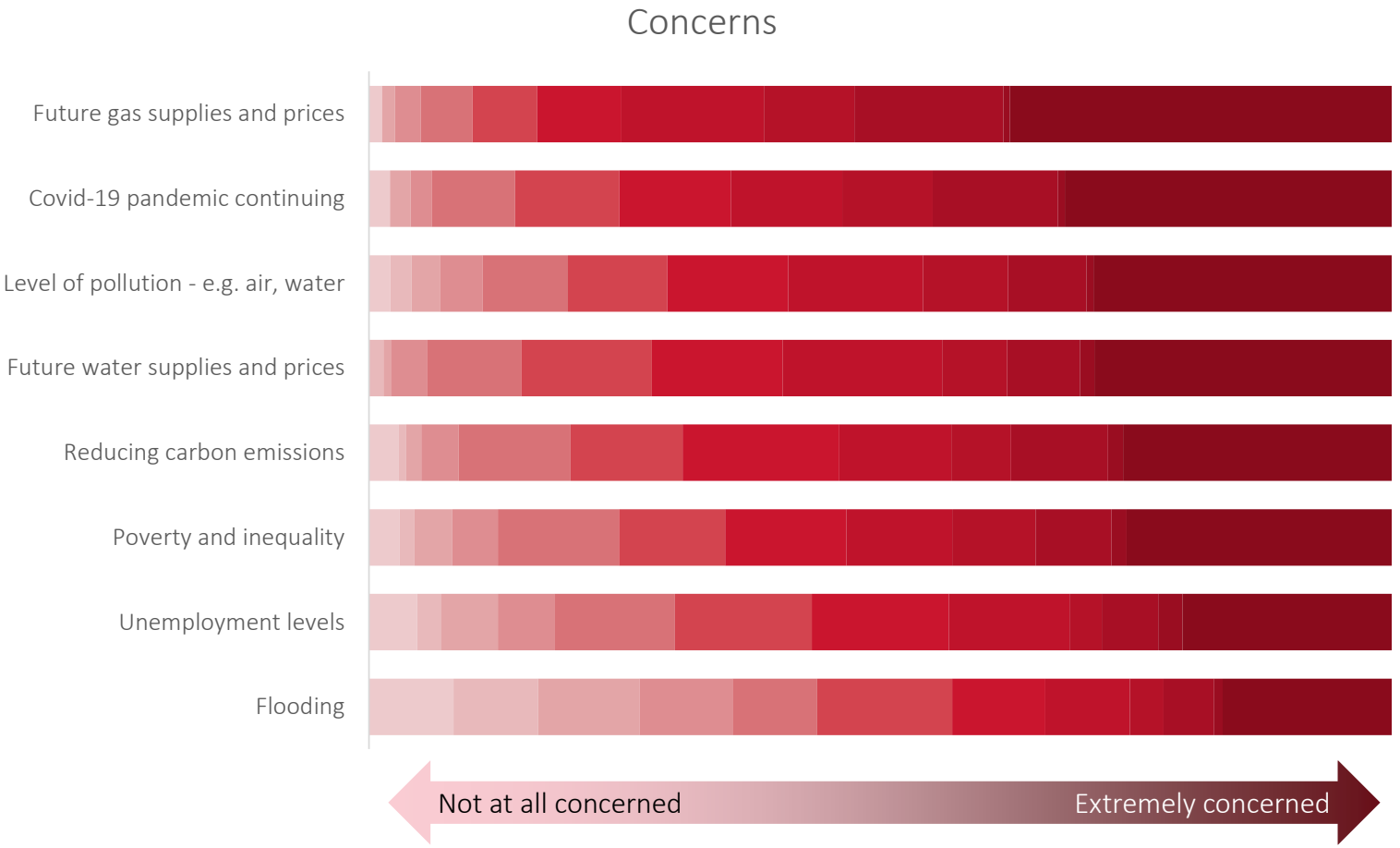
# But are, understandably, more important to those who are actively engaged in some sort of environmental activity

| | Total | I am an active member of an environmental/conservation group | I actively encourage family/friends/colleagues to be more environmentally conscious | I have lobbied politicians and/or signed petitions on environmental topics | None | |
|---|---|---|---|---|---|---|
| *I am concerned about the impact of climate change on the natural environment in my area* | Top 3 box | 52% | 71% | 68% | 74% | 36% | Sig lower than others |
| | Mean | 7.3 | 8.3 | 8.1 | 8.5 | 6.5 | |
| *Protecting lakes, rivers, reservoirs, fish and other aquatic plants and wildlife is really important to me* | Top 3 box | 64% | 70% | 74% | 80% | 56% | Sig lower than others |
| | Mean | 8.0 | 8.7 | 8.5 | 9.0 | 7.5 | |
| *I do more to save energy than I do to save water in my home** | Top 3 box | 26% | 25% | 29% | 19% | 24% | |
| | Mean | 5.8 | 6.2 | 5.9 | 5.6 | 5.9 | |
| *I worry about the amount of water available for use in my local area* | Top 3 box | 24% | 37% | 28% | 26% | 17% | Sig lower than others |
| | Mean | 5.3 | 6.4 | 5.8 | 5.7 | 4.8 | |
| *I don`t think much about saving water, I just take it for granted really** | Top 3 box | 18% | 40% | 16% | 10% | 18% | |
| | Mean | 4.6 | 6.7 | 4.1 | 3.7 | 4.8 | |
| | | | | | Sig lower than 1st option (active member) | | |

Q30. How much do you agree or disagree with the following statements:(n=1015) (* - Online Panel only , n= 503)

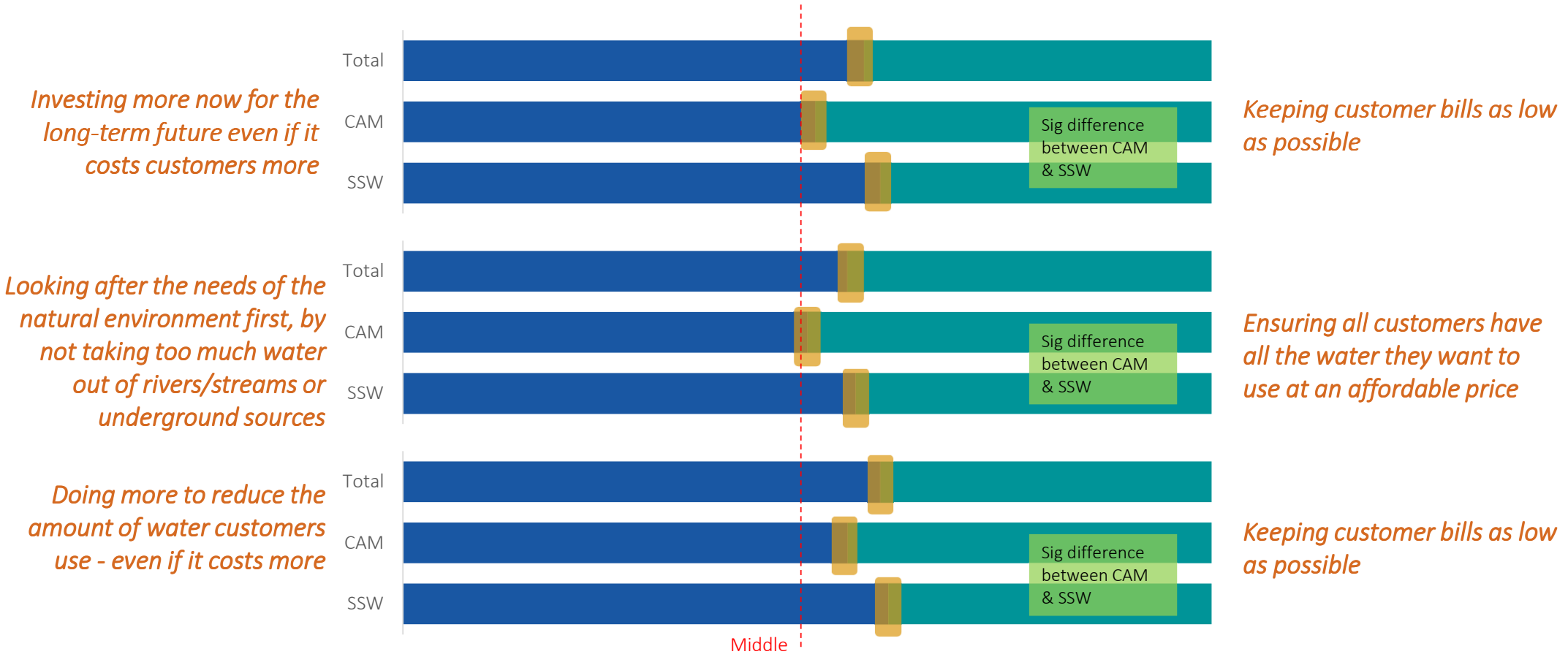
# Customers are most concerned about future energy prices and issues relating to the CV-19 pandemic




| | Top 3 box | Mean | |
|---|---|---|---|
| Future gas supplies and prices | 59% | 7.6 | Sig higher in Bill payers |
| Covid-19 pandemic continuing | 47% | 7.2 | |
| Level of pollution - e.g. air, water | 42% | 6.7 | |
| Future water supplies and prices | 41% | 6.9 | Sig higher in Bill payers |
| Reducing carbon emissions | 36% | 6.7 | |
| Poverty and inequality | 35% | 6.5 | |
| Unemployment levels | 26% | 6.0 | |
| Flooding | 20% | 5.1 | Sig higher in CAM |

Q34. On a scale of 1-10 how concerned are you about the following in the area where [HH] you live [NHH] your organisation is located? ( Online Panel only , n= 503)

# Planning balances: sig differences between CAM & SSW
# SSW more likely to lean towards keeping bill low/affordable




Q33. We'd like to understand your initial reaction to some key balances in terms of the company's general approach to planning and where you stand on each. Please indicate the point on the scale that that most closely reflects how you feel: , (n=1015)

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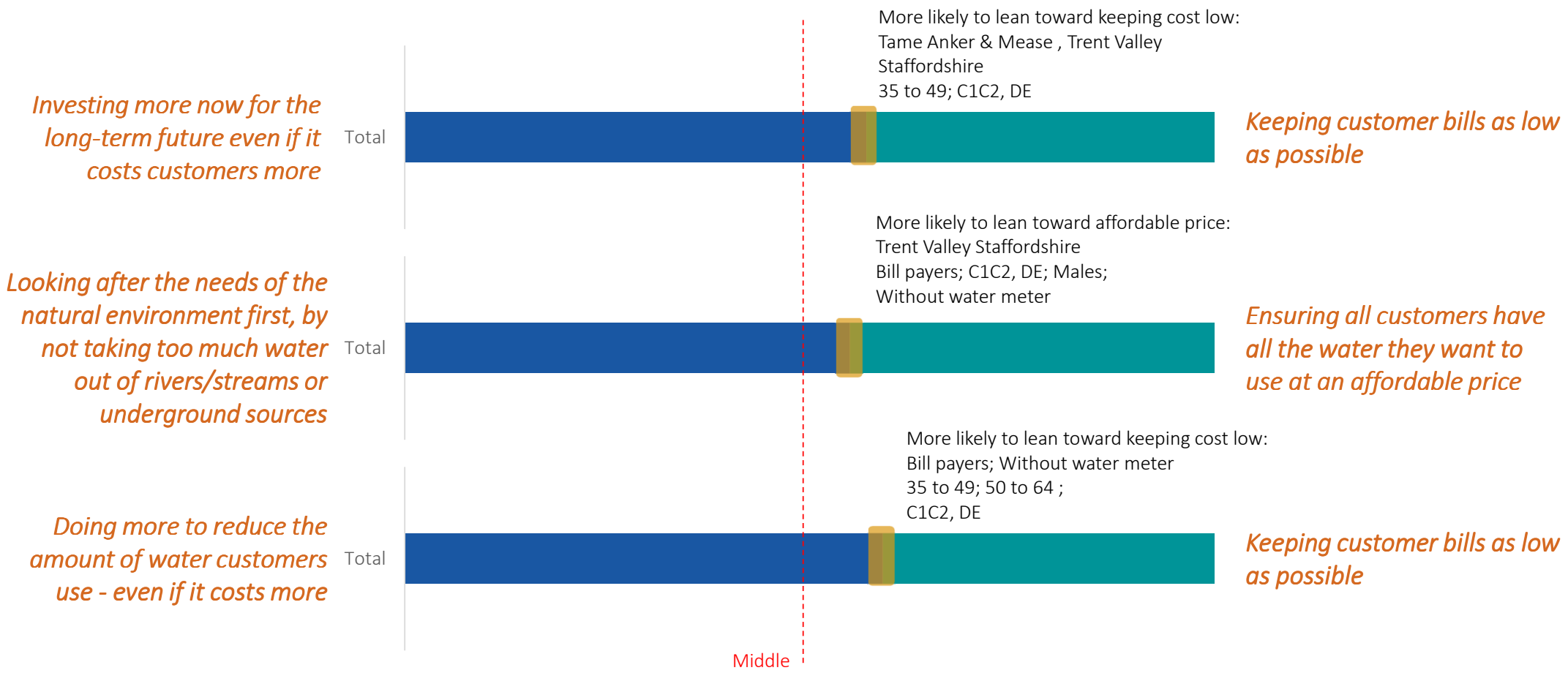
# Total: Planning balances: sig differences between sub groups
# Lower social grades more likely to lean towards keeping bill low/affordable




Q33. We'd like to understand your initial reaction to some key balances in terms of the company's general approach to planning and where you stand on each. Please indicate the point on the scale that that most closely reflects how you feel: , (n=1015)

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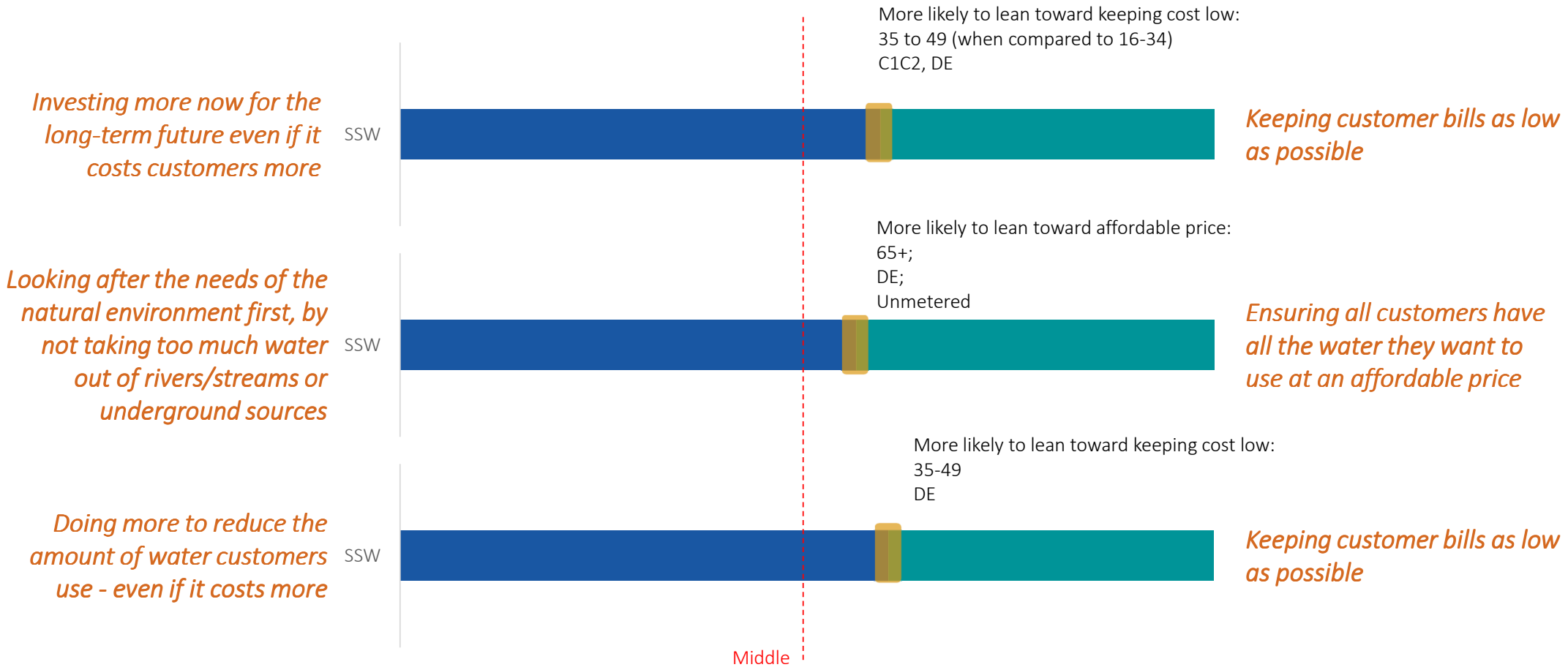
# SSW: Planning balances: sig differences between sub groups
# Similar to the total sample, lower social grades and those 35-49 are more likely to prefer affordable bills




Q33. We'd like to understand your initial reaction to some key balances in terms of the company's general approach to planning and where you stand on each. Please indicate the point on the scale that that most closely reflects how you feel: , (n=1015)

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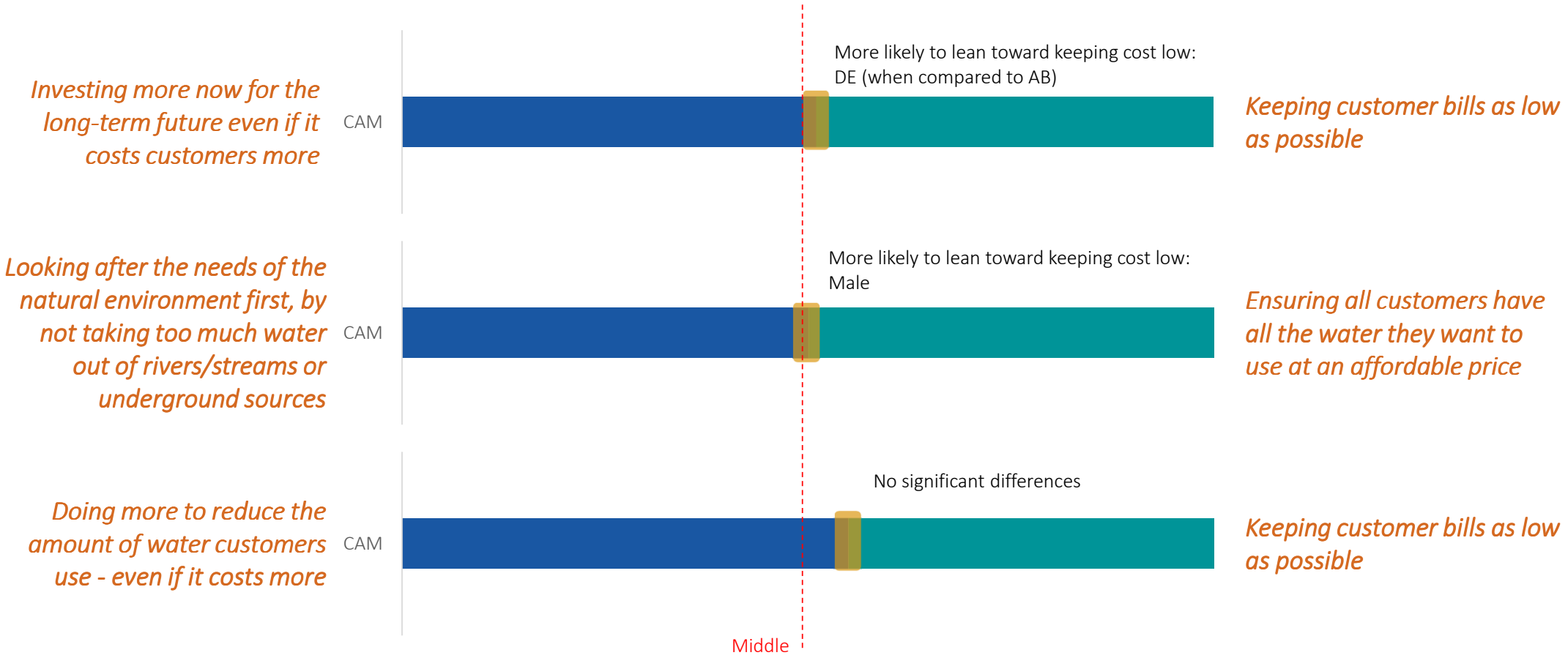
# CAM: Planning balances: sig differences between sub groups
# Very little significant differences can be seen among the CAM sample




Q33. We'd like to understand your initial reaction to some key balances in terms of the company's general approach to planning and where you stand on each. Please indicate the point on the scale that that most closely reflects how you feel: , (n=1015)

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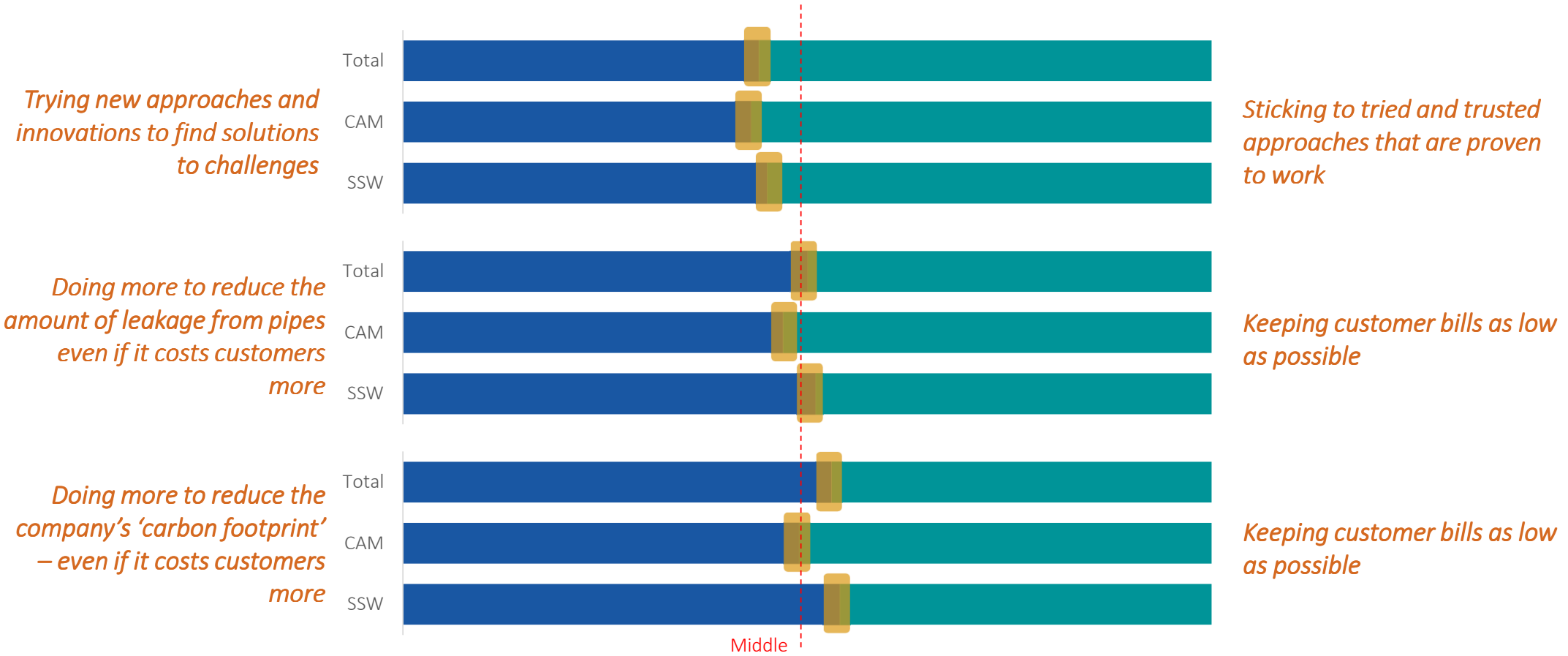
# Planning balances. Customers more likely to favour low bills than look for innovation. No sig differences between SSW and CAM




Q33. We'd like to understand your initial reaction to some key balances in terms of the company's general approach to planning and where you stand on each. Please indicate the point on the scale that that most closely reflects how you feel: , (n=1015)

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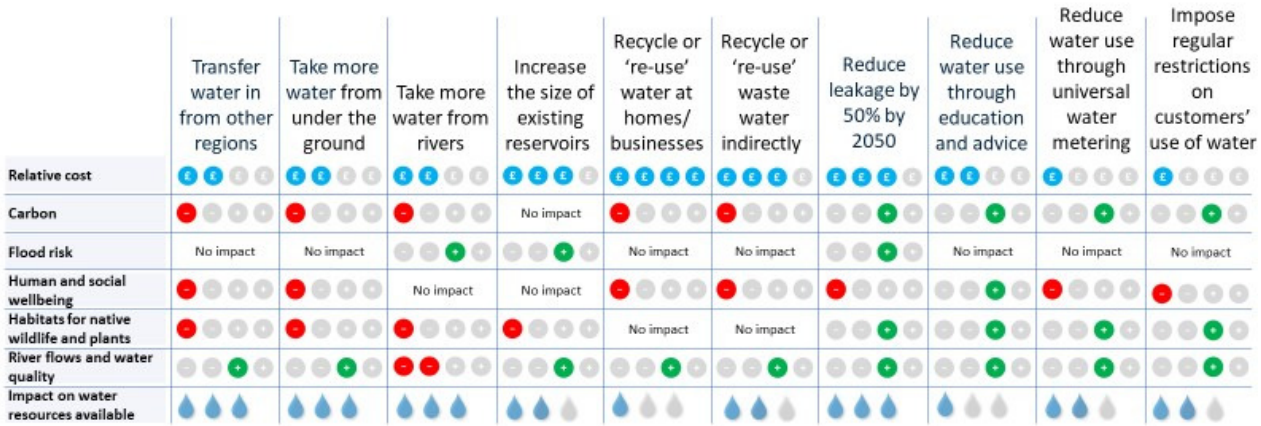
# Supply/Demand Options: SSW Region

# Ten supply/demand options shown to SSW customers



| | Transfer water in from other regions | Take more water from under the ground | Take more water from rivers | Increase the size of existing reservoirs | Recycle or 're-use' water at homes/ businesses | Recycle or 're-use' waste water indirectly | Reduce leakage by 50% by 2050 | Reduce water use through education and advice | Reduce water use through universal water metering | Impose regular restrictions on customers' use of water |
|---|---|---|---|---|---|---|---|---|---|---|
| Relative cost | £ £ | £ £ | £ £ | £ £ £ | £ £ £ £ | £ £ £ | £ £ £ | £ £ | £ | £ |
| Carbon | - | - | - | No impact | - | - | + | + | + | + |
| Flood risk | No impact | No impact | + | + | No impact | No impact | + | No impact | No impact | No impact |
| Human and social wellbeing | - | - | No impact | No impact | - | - | - | + | - | - |
| Habitats for native wildlife and plants | - | - | - | - | No impact | No impact | + | + | + | + |
| River flows and water quality | + | + | - - | + | + | + | + | + | + | + |
| Impact on water resources available | 💧💧💧 | 💧💧💧 | 💧💧💧 | 💧💧 | 💧 | 💧💧 | 💧💧💧 | 💧 | 💧 | 💧 |

**Key:**

- £ This is the cost to South Staffs Water but will impact on customer bills further down the line. The more blue £ signs shown, the higher the cost and the greater the likelihood this will impact on customer bills
- \+ The amount of increase in each measure the option will result in. The more green plus signs, the more the positive impacts or reduction in negative effects!
- \- The amount of reduction in each measure this option will result in. The more red minus signs, the more the negative impact or increase in negative effects!
- 💧 The more water drops shown, which are coloured blue, the more effective the option is at providing the amount of water needed to meet future demand

See Appendix A for more details of the modelling process

## Reduce leakage by 50% by 2050

| Option description | Impact |
|---|---|
| In 2020-21 leakage was 65.5 million litres per day, or 26 Olympic swimming pools. Leaks can occur on the water company's pipe network (70% of the total) or in pipe found on customers' homes (30% of total). Methods used to reduce leakage include; preventing leaks, raising awareness of leaks, locating leaks and mending leaks. | Relative cost: £ £ £ £<br>Carbon: - - + +<br>Flood risk: - - + +<br>Human and social wellbeing: - - + +<br>Habitats for native wildlife and plants: - - + +<br>River flows and water quality: - - + +<br>Impact on water resources available: 💧💧💧 |

**Key:**

- £ This is the cost to South Staffs Water but will impact on customer bills further down the line. The more blue £ signs shown, the higher the cost and the greater the likelihood this will impact on customer bills
- \+ The amount of increase in each measure the option will result in. The more green plus signs, the more the positive impacts or reduction in negative effects!
- \- The amount of reduction in each measure this option will result in. The more red minus signs, the more the negative impact or increase in negative effects!
- 💧 The more water drops shown, which are coloured blue, the more effective the option is at providing the amount of water needed to meet future demand

## Reduce water use through universal water metering

| Option description | Impact |
|---|---|
| Water meters help people understand and reduce their usage and help identify leaks in pipes. Customers pay for the water they use. Meters would be installed at all customer properties. 55% of household properties and 90% of business premises have a meter. Water meters are installed in all new builds and customers can ask for a meter to be installed. South Staffs Water does not have a policy of installing a meter when a property changes hands, which some water companies do. | Relative cost: £<br>Carbon: - - + +<br>Flood risk: No impact<br>Human and social wellbeing: - - + +<br>Habitats for native wildlife and plants: - - + +<br>River flows and water quality: - - + +<br>Impact on water resources available: 💧💧 |

**Key:**

- £ This is the cost to South Staffs Water but will impact on customer bills further down the line. The more blue £ signs shown, the higher the cost and the greater the likelihood this will impact on customer bills
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- \- The amount of reduction in each measure this option will result in. The more red minus signs, the more the negative impact or increase in negative effects!
- 💧 The more water drops shown, which are coloured blue, the more effective the option is at providing the amount of water needed to meet future demand

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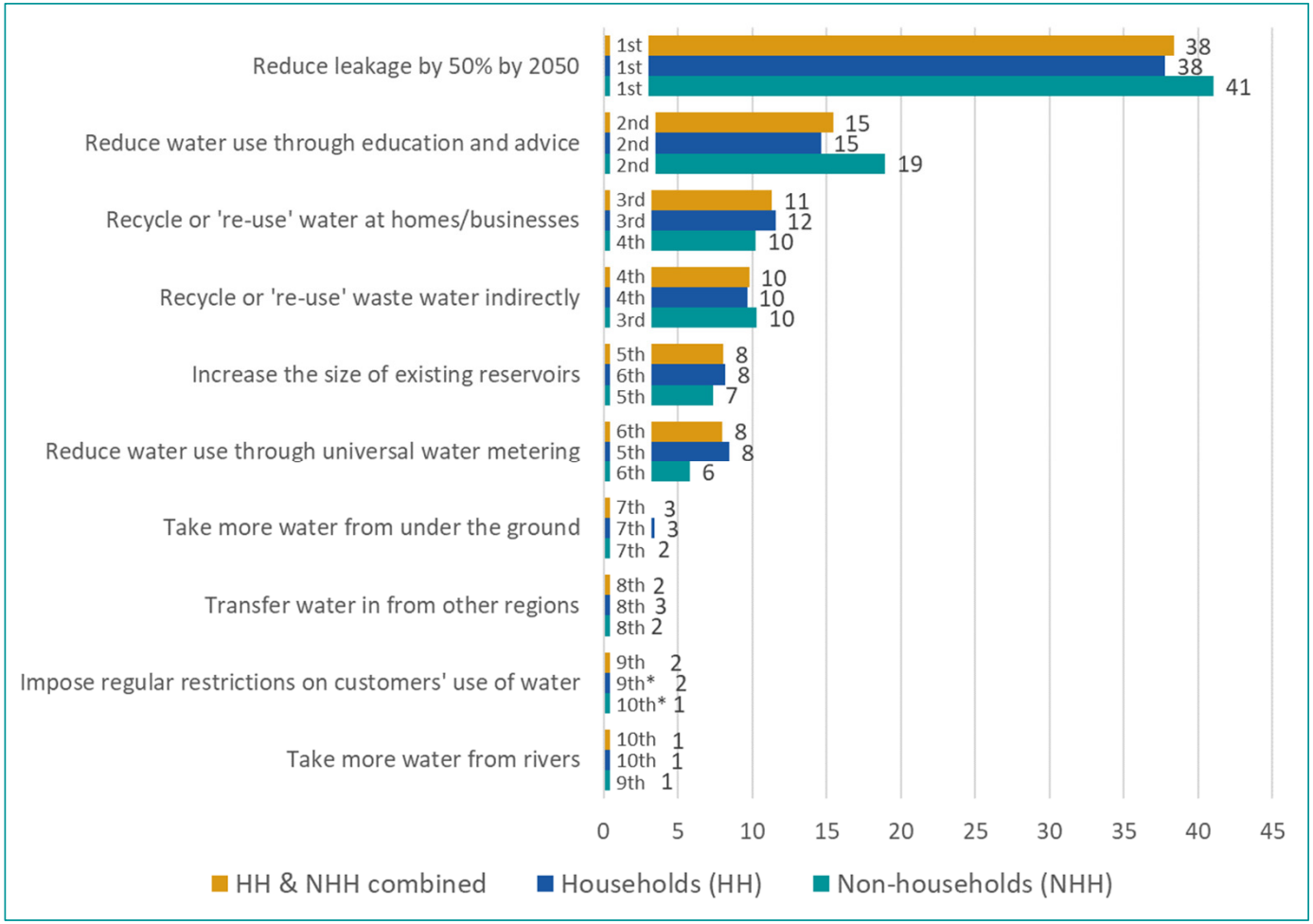
# SUPPLY/DEMAND OPTIONS: PRIORITY SCORES AND RANKS

## SSW REGION: HOUSEHOLDS AND NON-HOUSEHOLDS




- Priority scores: A measure of preference intensity on a 0-100 scale
- Same options ranked 1st and 2nd by both HH and NHH customers:
  - Reducing leakage
  - Reducing water use through education
- The rankings are very similar between HH and NHH
- The top three options account for around two thirds of the total 'preference weight'

Significant differences marked by *: a) rank difference of at least one place; and b) difference between priority scores statistically significant at the 5% level


Base: Households=661; Non-households=76 (weighted)

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# SUPPLY/DEMAND OPTIONS: Community Research qualitative insights form customer forum (informed view)

SSW REGION




- Top option consistent across qualitative and quantitative studies
- Difference in ordering of other options could be due to research approach, such as methodological differences – customers were instructed that they must select one supply option to meet future demand balance

Demand management options come first for many. Supply solutions a last resort for some

Abstracting more water was an unpopular choice in both areas

Many want a balance between demand management and increasing supply

Negative environmental impacts are to be avoided

Stronger support for compulsory metering in Cambridge than in South Staffs

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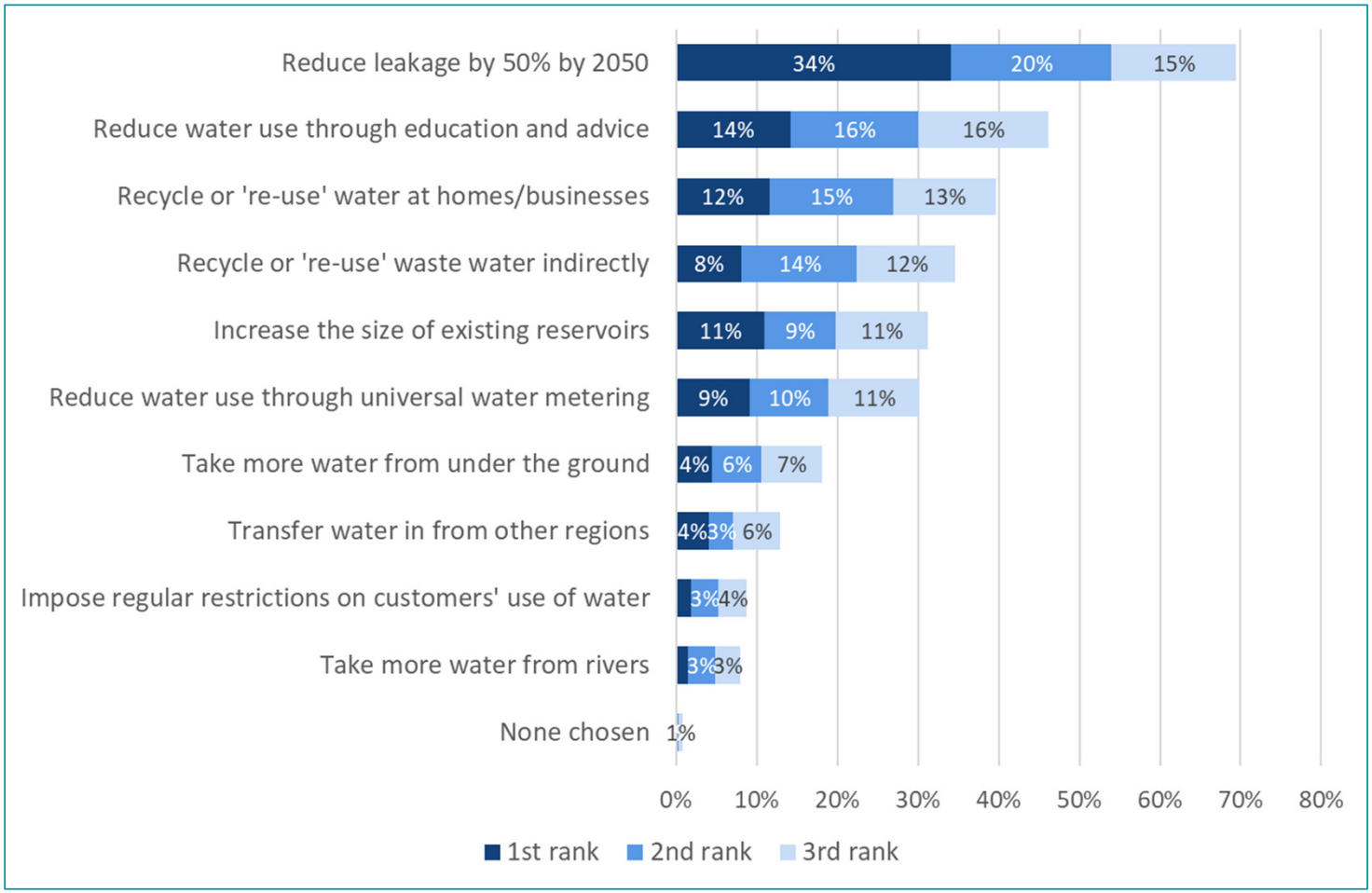
# SUPPLY/DEMAND OPTIONS: CHOICES PROPORTIONS

## SSW REGION: HOUSEHOLDS AND NON-HOUSEHOLDS COMBINED




Base: 737 SSW customers (weighted)

The combined HH & NHH ranking of options obtained by summing the proportions picking each option for 1st, 2nd, and 3rd rank is identical to that obtained from the econometric models



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# TOP THREE PRIORITIES BY CATCHMENT AREA

## SSW REGION: HOUSEHOLDS & NON-HOUSEHOLDS COMBINED

### SSW region

| | |
|---|---|
| 1ST | REDUCE LEAKAGE |
| 2ND | REDUCE USE THROUGH EDUCATION |
| 3RD | RECYCLE AT HOMES/BUSINESSES |

Base: 737 (weighted)

### Tame Anker and Mease

| | |
|---|---|
| 1ST | REDUCE LEAKAGE |
| 2ND | REDUCE USE THROUGH EDUCATION |
| 3RD | RECYCLE AT HOMES/BUSINESSES |

Base: 327 (weighted)

### Severn Middle Worcestershire

| | |
|---|---|
| 1ST | REDUCE LEAKAGE |
| 2ND | REDUCE USE THROUGH EDUCATION |
| 3RD | RECYCLE AT HOMES/BUSINESSES |

Base: 90 (weighted)

### Trent Valley Staffordshire

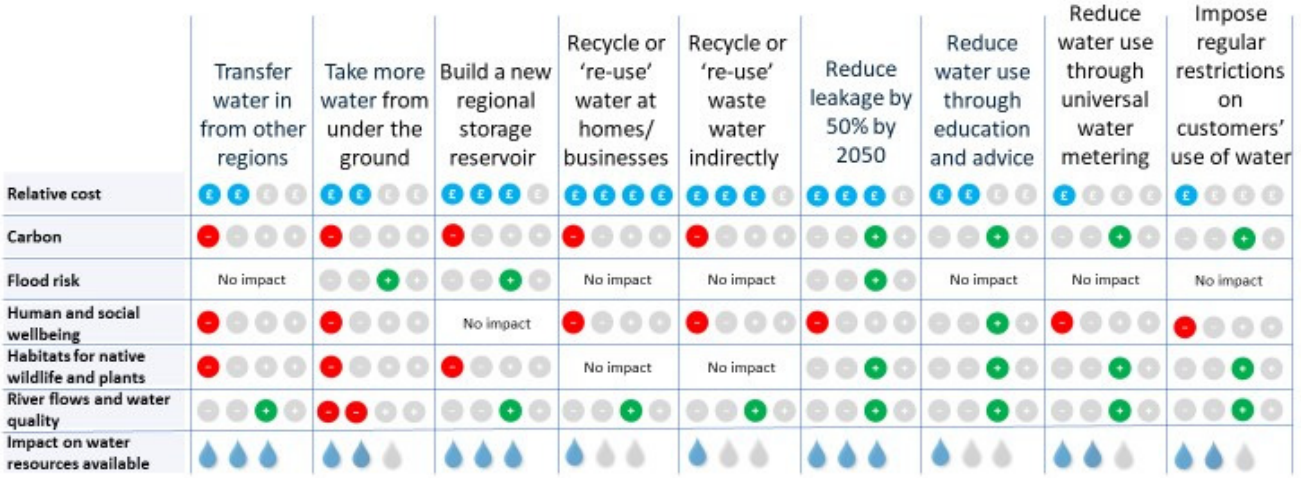
| | |
|---|---|
| 1ST | REDUCE LEAKAGE |
| 2ND | REDUCE USE THROUGH EDUCATION |
| 3RD | RECYCLE AT HOMES/BUSINESSES |

Base: 84 (weighted)

Note: Catchment area missing for 200 participants (weighted). Not included: 1 participant (unweighted) from the Tame, Anker and Mease area whose region was coded as CAM

# Supply/Demand Options: CAM Region

# Nine supply/demand options shown to CAM customers



| | Transfer water in from other regions | Take more water from under the ground | Build a new regional storage reservoir | Recycle or 're-use' water at homes/ businesses | Recycle or 're-use' waste water indirectly | Reduce leakage by 50% by 2050 | Reduce water use through education and advice | Reduce water use through universal water metering | Impose regular restrictions on customers' use of water |
|---|---|---|---|---|---|---|---|---|---|
| Relative cost | £ £ | £ £ | £ £ £ | £ £ £ £ | £ £ £ | £ £ £ | £ £ | £ | £ |
| Carbon | − | − | − | − | − | + | + | + | + |
| Flood risk | No impact | + | + | No impact | No impact | + | No impact | No impact | No impact |
| Human and social wellbeing | − | − | No impact | − | − | − | + | − | − |
| Habitats for native wildlife and plants | − | − | − | No impact | No impact | + | + | + | + |
| River flows and water quality | + | − − | + | + | + | + | + | + | + |
| Impact on water resources available | 💧💧💧 | 💧💧 | 💧💧💧 | 💧 | 💧 | 💧💧💧 | 💧 | 💧💧 | 💧💧 |

£ This is the cost to Cambridge Water but will impact on customer bills further down the line. The more blue £ signs shown, the higher the cost and the greater the likelihood this will impact on customer bills

\+ The amount of increase in each measure the option will result in. The more green plus signs, the more the positive impacts or reduction in negative effects!

− The amount of reduction in each measure this option will result in. The more red minus signs, the more the negative impact or increase in negative effects!

## Transfer water in from other regions

| Option description | Impact |
|---|---|
| Cambridge Water could receive water from one or more water companies in order to meet demand. The supply would most commonly be already treated and come through a pipeline or could be untreated water using a canal or river to move the water and treated by Cambridge Water at its own works | Relative cost: £ £<br>Carbon: −<br>Flood risk: No impact<br>Human and social wellbeing: −<br>Habitats for native wildlife and plants: −<br>River flows and water quality: +<br>Impact on water resources available: 💧💧💧 |

**Key:**

£ This is the cost to Cambridge Water but will impact on customer bills further down the line. The more blue £ signs shown, the higher the cost and the greater the likelihood this will impact on customer bills

\+ The amount of increase in each measure the option will result in. The more green plus signs, the more the positive impacts or reduction in negative effects!

− The amount of reduction in each measure this option will result in. The more red minus signs, the more the negative impact or increase in negative effects!

💧 The more water drops shown, the more effective the option is at providing the amount of water needed to meet future demand.

## Recycle or 're-use' water at homes/businesses

| Option description | Impact |
|---|---|
| Cambridge Water could help support developers and existing home and business owners to install systems to capture rainwater, treat and re-use water locally for uses like flushing toilets and watering plants. This could be done at an individual property level, or on a much larger community or development scale | Relative cost: £ £ £ £<br>Carbon: −<br>Flood risk: No impact<br>Human and social wellbeing: −<br>Habitats for native wildlife and plants: No impact<br>River flows and water quality: +<br>Impact on water resources available: 💧 |

**Key:**

£ This is the cost to Cambridge Water but will impact on customer bills further down the line. The more blue £ signs shown, the higher the cost and the greater the likelihood this will impact on customer bills

\+ The amount of increase in each measure the option will result in. The more green plus signs, the more the positive impacts or reduction in negative effects!

− The amount of reduction in each measure this option will result in. The more red minus signs, the more the negative impact or increase in negative effects!

💧 The more water drops shown, the more effective the option is at providing the amount of water needed to meet future demand

See Appendix A for more details of the modelling process

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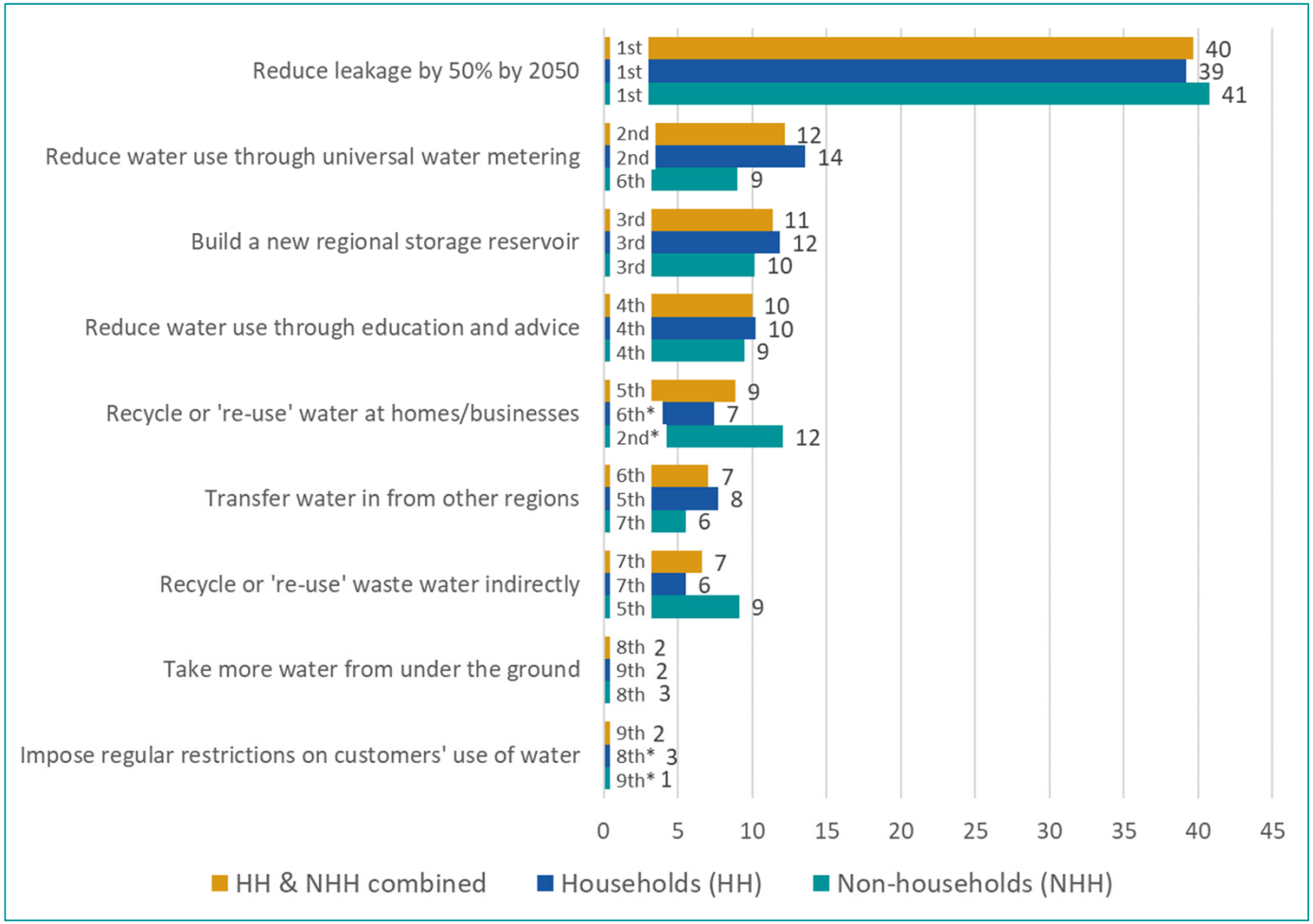
# SUPPLY/DEMAND OPTIONS: PRIORITY SCORES AND RANKS

## CAM REGION: HOUSEHOLDS AND NON-HOUSEHOLDS




36 Base: Households=226; Non-households=52 (weighted)

- Priority scores: A measure of preference intensity on a 0-100 scale
- Same options ranked 1st and 3nd by both HH and NHH customers:
  - Reducing leakage
  - Build regional reservoir
- HH gave higher priority to reducing water use through metering (borderline statistically significant), whereas NHH gave higher priority to recycling water at homes/businesses

Significant differences marked by *: a) rank difference of at least one place; and b) difference between priority scores statistically significant at the 5% level

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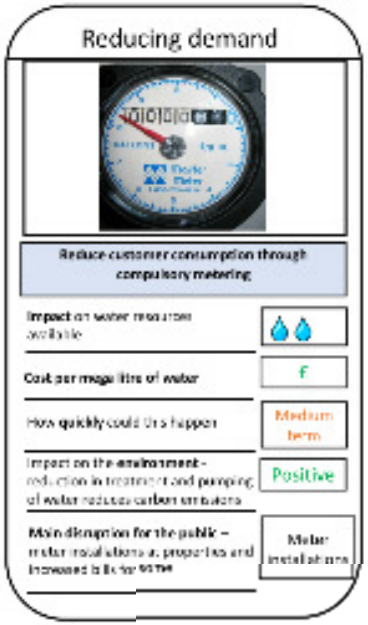
# SUPPLY/DEMAND OPTIONS: Community Research qualitative insights form customer forum (informed view)

CAM REGION






- Top two options consistent across qualitative and quantitative studies (although ordering reversed)
- Recycling was ranked 5th in the quantitative study, although there was only a 2% difference between this and the 3rd ranked option Difference in ordering of other options could be due to research approach, such as methodological differences – customers were instructed that they must select one supply option to meet future demand balance

Demand management options come first for many. Supply solutions a last resort for some

Abstracting more water was an unpopular choice in both areas

Many want a balance between demand management and increasing supply

Negative environmental impacts are to be avoided

Stronger support for compulsory metering in Cambridge than in South Staffs

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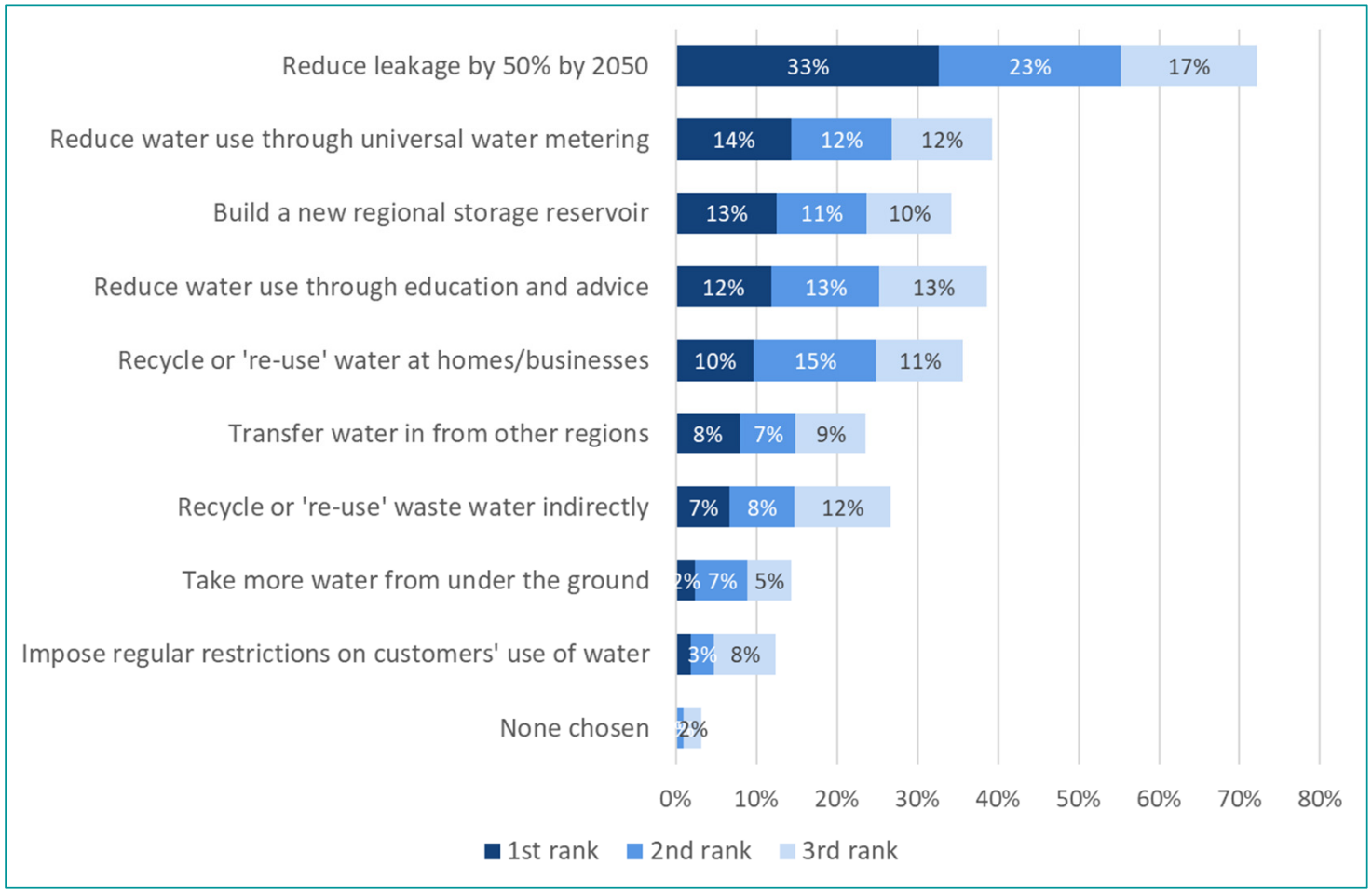
# SUPPLY/DEMAND OPTIONS: CHOICES PROPORTIONS

## CAM REGION: HOUSEHOLDS AND NON-HOUSEHOLDS COMBINED




Base: 278 CAM customers (weighted)

The combined HH & NHH ranking of options obtained by summing the proportions picking each option for 1st, 2nd, and 3rd rank broadly agrees with the ranking obtained from the econometric models especially considering that 'Reduce use through metering', 'Build a regional reservoir', 'Reduce use through education', and 'Recycle at homes/businesses' have similar priority scores



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# TOP THREE PRIORITIES BY CATCHMENT AREA

## CAM REGION: HOUSEHOLDS & NON-HOUSEHOLDS COMBINED

### CAM region

| | |
|---|---|
| 1ST | REDUCE LEAKAGE |
| 2ND | REDUCE USE THROUGH METERING |
| 3RD | BUILD REGIONAL RESERVOIR |

Base: 278 (weighted)

### Cam and Ely Ouse

| | |
|---|---|
| 1ST | REDUCE LEAKAGE |
| 2ND | BUILD REGIONAL RESERVOIR |
| 3RD | REDUCE USE THROUGH METERING |

Base: 153 (weighted)

Note: Catchment area missing for 72 participants (weighted). Not included: 3 participants (unweighted) from the Cam and Ely Ouse area whose region was coded as SSW

# Reasons for Selecting Supply/Demand Options

# Reduce leakage by 50% by 2050

SSW:
1st choice = 34%
2nd choice = 20%
3rd choice = 15%

CAM:
1st choice = 33%
2nd choice = 23%
3rd choice = 17%

| Waste is unwanted | No negative environmental impact | Easy & quick win | Helps customer understand SSW/CW's roles | Reduce bill cost |
|---|---|---|---|---|
| *Leakage is just plain waste, the ambition should be a greater than 50% reduction!*<br><br>*This seems the most logical option and the most sustainable for long term. Waste is needless and should be remedied.*<br><br>*Because as I have experience of a leak I know how much is wasted before it is fully resolved. Needs to be dealt with quicker.*<br><br>*It is such a terrible waste of precious water and should be possible to achieve*<br><br>*We should not be wasting water that we have already paid to extract, purify, and transport. It is pure waste of both money and water.* | *Long term gains with no additional environmental cost*<br><br>*Because, if your chart is to be believed, it will a high impact on the amount of water available, while not having a large adverse impact on the environment*<br><br>*This saves water and is the logically the best solution towards improving the environment (mitigating climate change, increasing biodiversity etc.) But repairs should be checked regularly too!* | *Seems like any 'easy win' and doesn't cost as much as some of the other options*<br><br>*Leakage reduction is a quick win - letting water leak for days in many cases to allow for effective use of contractor resources creates the impression that leakage isn't important and the water industry is not committed to reducing waste. The public sees that you don't care* | *This is cost effective and ensures your customers understand that you are doing your bit.*<br><br>*In terms of people's attitude to water companies, loss through leakage seems to infuriate them most, plus leads to disregard of education about water use. So in terms of customer relations would be good thing.*<br><br>*Water companies are notorious for losing millions of litres a day as they haven't updated the pipe system in years. More concerned with lining investors pockets* | *By reducing leakage, more water should be available to customers keeping costs down.*<br><br>*if you fix the pipes with new ( not patched ) then that will cut the loss of water allowing longer water usage it will also keep the bills down*<br><br>*This would impact the reduction in customer bills.* |

Themes broadly consistent with no one area dominating

# Reduce water use through education and advice

SSW:
1st choice = 14%
2nd choice = 16%
3rd choice = 16%

CAM:
1st choice = 12%
2nd choice = 13%
3rd choice = 10%

| The right knowledge can help change behaviour | Cost effective | Start education early | Positive long term impact | Teach to respect the environment & appreciate water |
|---|---|---|---|---|
| *I chose this answer because there should be more information that people need to know a out the uses of water so then people will know how to try and save water as well as save money*<br><br>*If people understand water wastage from simple use at home then they might change how they use their water in the first place. Like turning their tap off instead of leaving a tap running while brushing their teeth. Simple things.*<br><br>*Educating people is the best place to start as I'm sure most people would be surprised how much water we actually use in different areas* | *Cost effective. Seen too much unnecessary waste of water by ill-informed companies/people*<br><br>*In the information this had low cost and high benefits. I think by educating people about water use they can understand and use water responsibly.*<br><br>*In the charts and information shown this had the most positives and was cost effective* | *Children can be taught in school. I used to think water was free .*<br><br>*It all starts if we are educated as early as possible in life*<br><br>*If more people are educated as to the effects and the dangers of excessive consumption, primarily from a younger age they will grow up to be conscious of their consumption and take an active stance.* | *It has a more positive long-term impact without negatively effecting customers by higher bills. It is a long-term solution that should be more effective with each generation.*<br><br>*By educating people on better ways to do things it allows them to understand why it's a good idea and gives them to options and knowledge to make long lasting changes*<br><br>*Dry simple to do and provides a long term solution*<br><br>*Would have a bigger impact in the long run as people change their habits* | *It will teach people to respect water as we need it to survive if the environment and the ozone continued to threaten us we will have no water*<br><br>*I feel we are not educated enough about this. I have always just thought it was expensive as water is vital to live and should be a basic human right that everyone has free water.*<br><br>*General public need to appreciate that water is a valuable resource and shouldn't be taken for granted.*<br><br>*We take too much for granted. A turn of a tap, and the water is there. It doesn't take too much to influence water users to rethink, and save wastage.* |

Themes broadly consistent with no one area dominating

# Recycle or ‘re-use’ water at homes/businesses

SSW:
1st choice = 12%
2nd choice = 15%
3rd choice = 13%

CAM:
1st choice = 10%
2nd choice = 15%
3rd choice = 11%

| Avoid taking water from nature & new infrastructure | Save more, waste less | If every one contributes it will add up | Quicker result |
|---|---|---|---|
| *Long-term this seems like the best solution for the environment as less water will need to be taken from the ground and does not involve building large-scale new infrastructure like a new reservoir.*<br><br>*Because I do not agree with a new reservoir! I think environment and biodiversity and water saving are vital ... and this way will ensure that used water is not simply going to waste!*<br><br>*It prevents further water being drawn from the surrounding area, and has the lowest overall impact* | *by reusing water we can save more water and waste less which is good for environment*<br><br>*I think its important to recycle or re use as much water as possible to save money and the environment*<br><br>*Recycling and not use/use/use/consume/destroy/take...seem s to be the best option. The world resources are limited and the number of humans is growing. We need to learn to take less, be more eco-friendly.*<br><br>*Because wasting water for single use is unnecessary for quite a few tasks.* | *Small changes turn into positive actions*<br><br>*'As this affects everyone who uses water. If we all do our bit to help then we can make a big difference whether it be at work or at home. If we all contribute and make changes to help this cause then we can have a big effect on how much we use.* | *Water supply is not infinite. Education will take time to filter down. Recycling and re-using are the best options for immediate effect.* |

Themes broadly consistent with no one area dominating

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# Recycle or ‘re-use’ water indirectly

SSW:
1st choice = 8%
2nd choice = 14%
3rd choice = 13%

CAM:
1st choice = 6%
2nd choice = 8%
3rd choice = 12%

| Avoid taking water from nature & new infrastructure | Use water further / more use of water | Environmental friendly | Sustainable solution |
|---|---|---|---|
| *Surely would be better than spending to get underground*<br><br>*The water is already there. With correct cleaning it should be fine to reuse*<br><br>*Waste water is there and available and not dependant on rainfall or rivers and aquifers*<br><br>*Recycling seems logical and cheap! No new infrastructure or harming the environment*<br><br>*If the water is already there and available. Just clean it and reuse*<br><br>*Because I like to save money and as little destruction as possible* | *Because at the moment a lot of water is being wasted whereas could be used further, eg water from the washing machine could have flush the toilet*<br><br>*Using treated clean water to flush toilets is wasteful. There could be some kind of system where ‘waste’ shower or bath water could be used to do this.*<br>*because it is wicked to waste water. I believe some countries use re-cycled, waste water for use in toilet systems. This makes complete sense to me. We do not need water of drinking water quality to flush toilets* | *Appears to be most eco friendly and doable*<br><br>*More environmentally sensitive*<br><br>*Overall best balance of costs (positive and negative) to customers, environment and society*<br><br>*I think this is a key way to reduce the impact upon the environment*<br><br>*Recycling of any raw material is a sound environmental aspect and impact moving forward*<br><br>*Because of the devastating environmental impact mismanaged waste water can have, finding new efficient ways to handle potentially harmful waste is very important* | *No more water needed is sustainable*<br><br>*i think this is the best long term decision as it provides a sustainable solution.*<br><br>*To become more sustainable*<br><br>*Long term sustainability* |

Themes broadly consistent with no one area dominating

# SSW: Increase the size of existing reservoirs

SSW:
1st choice = 11%
2nd choice = 9%
3rd choice = 11%

| Increase capacity = hold more water | Taking less water from rivers | Future supply – a more efficient option | Reduce flooding | Less impact than other option |
|---|---|---|---|---|
| *if a you can increase the size and capacity of an existing reservoir then it can hold more water so there is more water there in storage for use*<br><br>*Hold larger amount of water*<br><br>*With what was mentioned about more rainfall in winter and less in summer, the larger reservoir could give more room to store more as a back up during dryer periods, more so than now. also wasn't the biggest cost to be imposed on company or customer* | *Use more rainwater rather than taking from rivers, this should need less cleansing than rivers, not effect nature and use more natural resources*<br><br>*Long term best solution to water supply not affecting rivers* | *Recycling is the future and building bigger reservoirs is the answer to guarantee future supply.*<br><br>*Larger reservoirs will surely help the surrounding areas manage water supplies more efficiently* | *With flooding taking place more and more regularly it would be the most logical choice*<br><br>*You have already stated that rainfall has substantially increased. This has caused flooding in a number of areas, so why not capture this rainfall in larger reservoirs.*<br><br>*'This for me had less impact all round, and would potentially reduce the risk of flooding for some and its the one that made the most sense.*<br><br>*This would help reduce flooding by storing more water when it is plentiful and provide more water when it's not. We need to keep as much of the winter excess water as possible.* | *'Using the already "adapted" natural area, reservoirs and the overall impact of being dug deeper in dryer spells, or controlled emptying it seems as the longest lasting solution.*<br><br>*'As demand increases, more water will need to be stored to meet it. This won't impact on river flow but will increase the capacity to meet demand. It won't penalise poorer families as it won't restrict their use of water which could result in water poverty for the less well off. It will temporarily provide employment.* |

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Themes broadly consistent with no one area dominating

# CAM: Build a new regional storage reservoir

CAM:
1st choice = 13%
2nd choice = 11%
3rd choice = 16%

| It makes sense to capture rain water | Stop taking water from rivers | Future supply - Less reliant on other sources | Reduce flooding | Can become an attraction |
|---|---|---|---|---|
| *The autumn and winter seasons are getting much wetter, so much rain. It makes sense to collect the rain and also create wildlife areas to balance the excessive number of houses being built.*<br><br>*We need to capture as much rainfall as possible*<br><br>*Good to save excess rainfall* | *You need to stop over-extracting from rivers and aquifers. Water supply (i.e. rain) is variable across the country and by season. You need to bring water from where and when it is plentiful and store it for distribution when needed.*<br><br>*Longevity of such a facility; initial cost but hopefully not continuing costs; should provide new habitats for wildlife; will take strain of demand away from the river system.* | *This would provide a permanent reserve with less reliance from other sources*<br><br>*So the region is more independent & can possibly sell excess*<br><br>*It guarantees future water supply in times of drought*<br><br>*This seems to be the best way in the long term to ensure a consistent supply and will be beneficial to the environment and nature.* | *I believe that by locating a new reservoir near a ny flood plane or any area that is prone to flash floods does two services. One , if designed correctly, any sudden flood can be channelled directly into the new reservoir and two if designed with the public in mind it can be furnished with play areas and beaches etc and other services ie; toilets, cafe's, car parks, nature areas.*<br><br>*Looks to be cost effective to ensure sufficient water being available. Also improves flood risk situation generally.* | *A reservoir makes sense. If planned properly Can become even a nature reserve in fact…..Letting people visit, see wildlife etc* |

Themes broadly consistent with no one area dominating

# Reduce water use through universal water metering

SSW:
1st choice = 9%
2nd choice = 10%
3rd choice = 11%

CAM:
1st choice = 14%
2nd choice = 12%
3rd choice = 12%

| Low cost with minimal environmental impact | Pay for what you use | Make people more conscious of water usage |
|---|---|---|
| *This is a low cost option with minimal effects on the environment.*<br><br>*We need to be using less not just getting resources from elsewhere, and this seemed relatively cheap option that benefits most households as well as the planet.*<br><br>*This seems like a relatively non-invasive and cheap method, with the only negatives being in the social category (i.e. in my opinion the least important). There are also reportedly some benefits to the consumer in terms of lower bills.* | *Customers should pay for what they use. Having a meter enables customers to be aware of what they use and make economies if necessary.*<br><br>*I am a single pensioner with a disability and should pay less than a family and this will be achieved by metre use*<br><br>*Generally if you have to pay for what you use you will waste less. Friends that don't have a meter don't care how much they waste.*<br><br>*Seems one the fairest and cheapest options and some people will save money by having a meter because I have found my water bills cheaper since I had a meter* | *I feel it would make people think more about how much water they are using and is a cost effective method*<br><br>*Changes behaviours and makes individuals consider the amount of water they are using by directly charging them for it.*<br><br>*During the past year I had a water meter installed. This has made me conscious of how much water I waste. I consider water meters in all households would help households focus on how much water they are using / wasting*<br><br>*I think it's important for customers to take some responsibility for water wastage and I believe a water meter will help them do that* |

Themes broadly consistent with no one area dominating

# Take more water from under the ground

SSW:
1st choice = 4%
2nd choice = 6%
3rd choice = 7%

CAM:
1st choice = 2%
2nd choice = 7%
3rd choice = 5%

| Use the resources here | Keep cost down | A balance option with the least impact on the environment |
|---|---|---|
| *We need to use what we've got. Once we've got water then we need to make it useable*<br><br>*If its there and not being used to its full extend then why not? Easiest and cheapest option.*<br><br>*just feel we should use the resources that are there*<br><br>*Because there is 1000x more water underground*<br><br>*Because I think we do have quiet a lot of reserves underground and there it's more likely already filtered clean and healthy for using.* | *Keeps the cost down low*<br><br>*Because it would keep cost down and a natural resource*<br><br>*Smallest increase to customers bills.* | *From the tables my understanding was that this would have least impact on the environment*<br><br>*Cost effective solution with minimal environmental impact using a natural untapped resource*<br><br>*Balance of customer cost and protecting environment* |

Themes broadly consistent with no one area dominating

Accent

# Transfer water in from other regions

SSW:
1st choice = 4%
2nd choice = 3%
3rd choice = 6%

CAM:
1st choice = 8%
2nd choice = 7%
3rd choice = 9%

| Lower cost than other options | Effective at providing water | Take excess from elsewhere | Other options have negative impacts | A balanced option |
|---|---|---|---|---|
| *low cost and this operation has been used successfully before.*<br><br>*It's the cheapest option that provides the most water.*<br><br>*one of the cheaper options*<br><br>*Sounds inexpensive, relatively simple and effective* | *It is less expensive than the other options which means customer prices will not have to rise too much to cover it. It also provides a decent increase in water available. There is a good balance of costs and benefits with this option.* | *Seems the most logical option. If some areas have an excess, why not use it*<br><br>*There are other parts of England that have excessive rainwater.*<br><br>*If there is water somewhere that is not needed then we should make use of it.*<br><br>*It rains more in different parts of the country and there are lots of areas with flood waters that can be used*<br><br>*We know that in 1976 a hose pipe ban was imposed in this area but in Scotland and Wales they were running excess water into the sea during this period* | *Because building a reservoir will impact on land needed for land needed for food production. Taking land and homes from people. Losing history and village life in some places. Causing trauma , mental health problems and much stress to people. Stop building so many houses now 50,000 no more hospitals have been built to cope with these numbers.* | *Because it seems like a good trade off in terms of cost versus environmental impact and the perceived benefits.*<br><br>*One of the most cost effective measures with minimal impact to consumer.* |

Themes broadly consistent with no one area dominating

# Impose regular restrictions on customers' use of water

SSW:
1st choice = 2%
2nd choice = 3%
3rd choice = 4%

CAM:
1st choice = 1%
2nd choice = 3%
3rd choice = 8%

| Some people have no consideration when it come to using water | It stops people from wasting water | Less impact on nature |
|---|---|---|
| *Fed up of seeing neighbours using hosepipes to fill enormous paddling/swimming pools, using sprinklers to water front lawn in the height of summer*<br><br>*People tend to be wasteful with water. Filling huge pools for children...washing cars... watering gardens ... its unnecessary.. it may encourage people to consider what is REALLY needed.* | *to stop them wasting water*<br><br>*Because we need to restrict usage to focus people's minds on how much is wasted.* | *Most effective way of managing water consumption as to not negatively impact future reserves and allows agency total control*<br><br>*LESS HARM TO THE ENVIRONMENT AND LESS COST TO SS WATER AND CUSTOMERS IN THE LONG RUN.* |

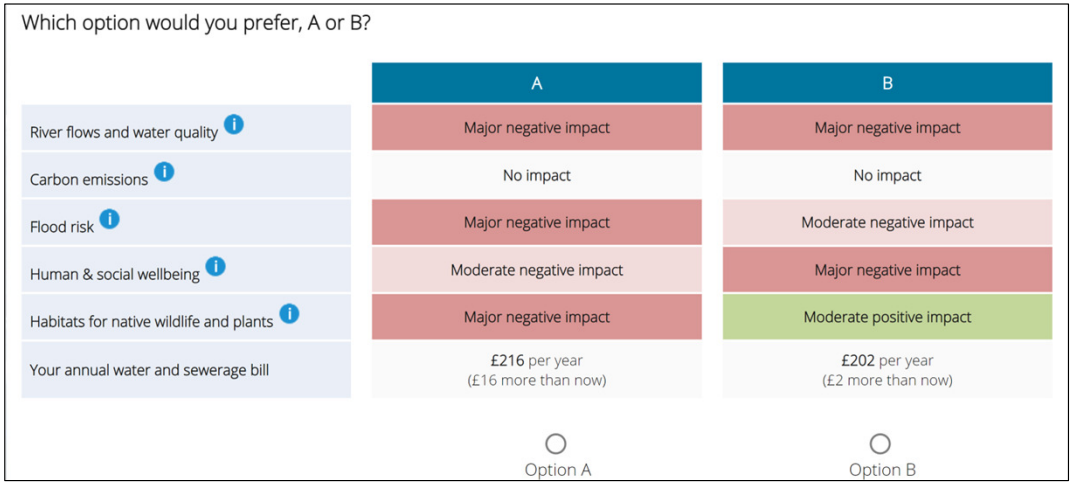
Themes broadly consistent with no one area dominating

# Decision Metric Weights

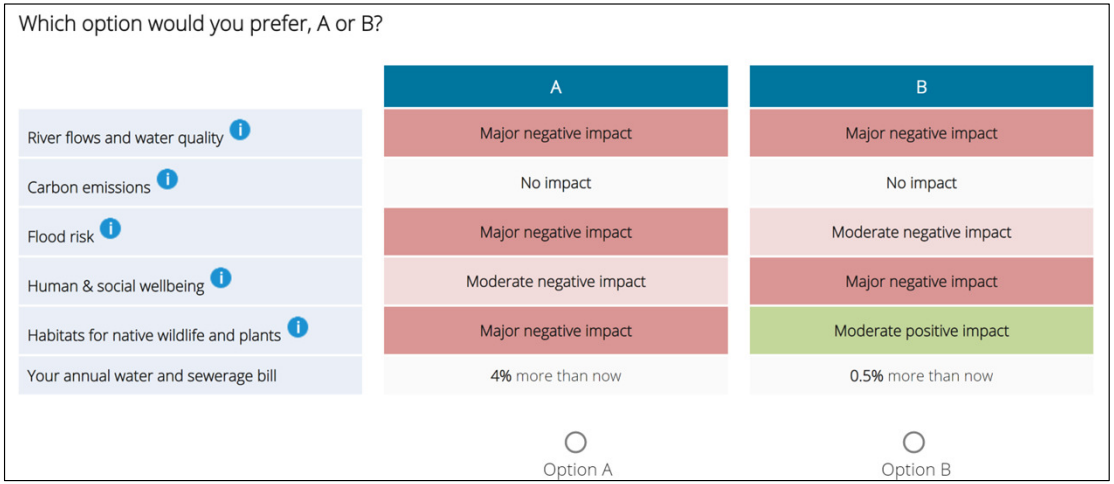
Accent

# Stated Preference Choice Exercise: Options for the Water Resources Plan

## SP CHOICE FORMAT FOR HOUSEHOLD CUSTOMERS




## SP CHOICE FORMAT FOR NON-HOUSEHOLD CUSTOMERS




- Survey participants saw eight question screens each.
- Attribute levels for each metric shown varied according to an experimental design.
- Difference between HH and NHH choice formats : HH bill impact shown in £s while non-household bill shown in %.
- Outcome from exercise is a measure of customer WTP for each metric attribute level.



Accent

# Measures of Content Validity

## HIGH LEVEL OF VALIDITY

- Very few instances of non-trading behaviour i.e., where participants always choose the same alternative throughout the exercise.
- Positive participant feedback: people were  able to make comparisons between the options presented to them.

### SP Non-traders

| Measure | HH | NHH | Total |
|---|---|---|---|
| Number of participants | 887 | 128 | 1,015 |
| % | **87%** | **13%** | **100%** |
| Always chose Option A | 11 | 3 | 14 |
| % | **1.2%** | **2.3%** | **1.3%** |
| Always chose Option B | 5 | 1 | 6 |
| % | **0.5%** | **0.7%** | **0.6%** |

### SP Participant feedback

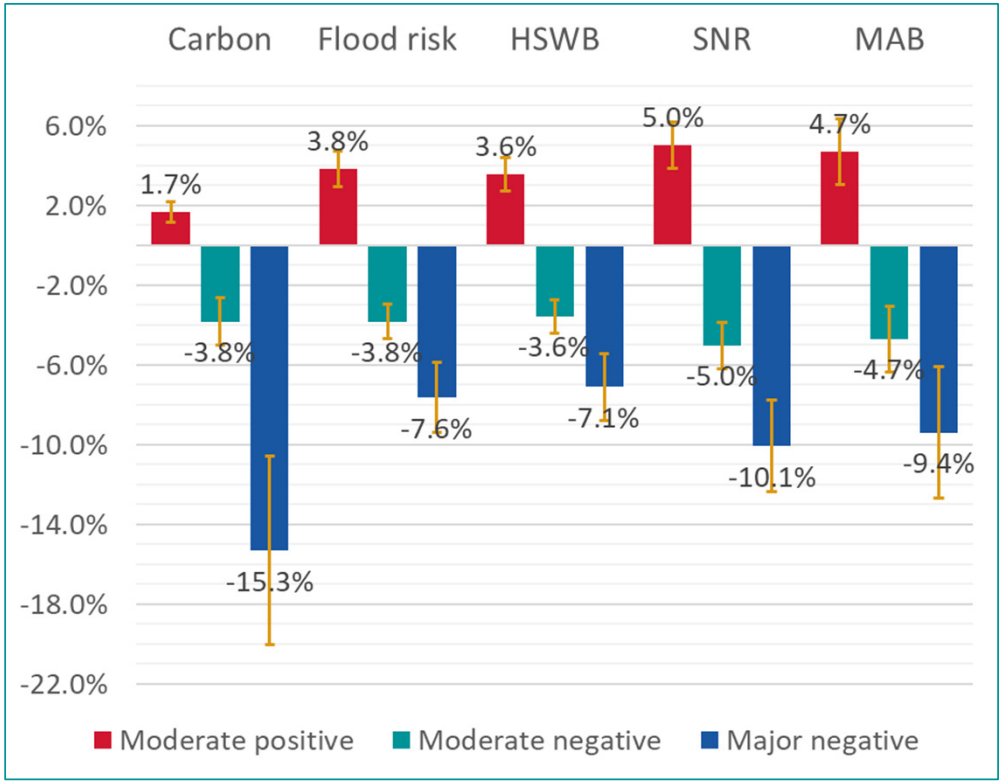
| Measure | Yes | No | Total |
|---|---|---|---|
| HH: Did you generally feel able to make comparisons between the choices presented to you? | 766 | 121 | 887 |
| % | **86%** | **14%** | **100%** |
| NHH: Did you generally feel able to make comparisons between the choices presented to you? | 111 | 17 | 128 |
| % | **87%** | **13%** | **100%** |

Accent

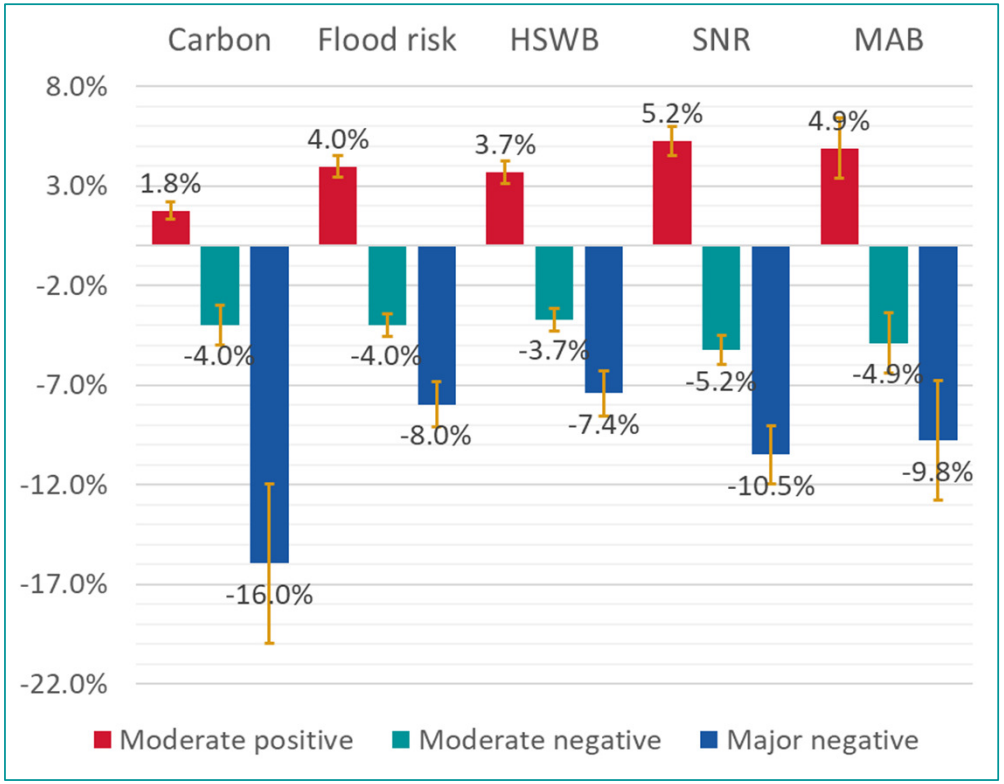
# Willingness to Pay

## SSW REGION: HOUSEHOLDS AND NON-HOUSEHOLDS

### Households




### Non-households




Note: The percentages indicate mean WTP referred to the annual water only bill. The vertical bars indicate 90% confidence intervals calculated using the Delta method. See Appendix for details on the calculation of WTP values. HSWB = Human & social wellbeing; SNR = Habitats for native wildlife and plants; MAB = River flows and water quality.

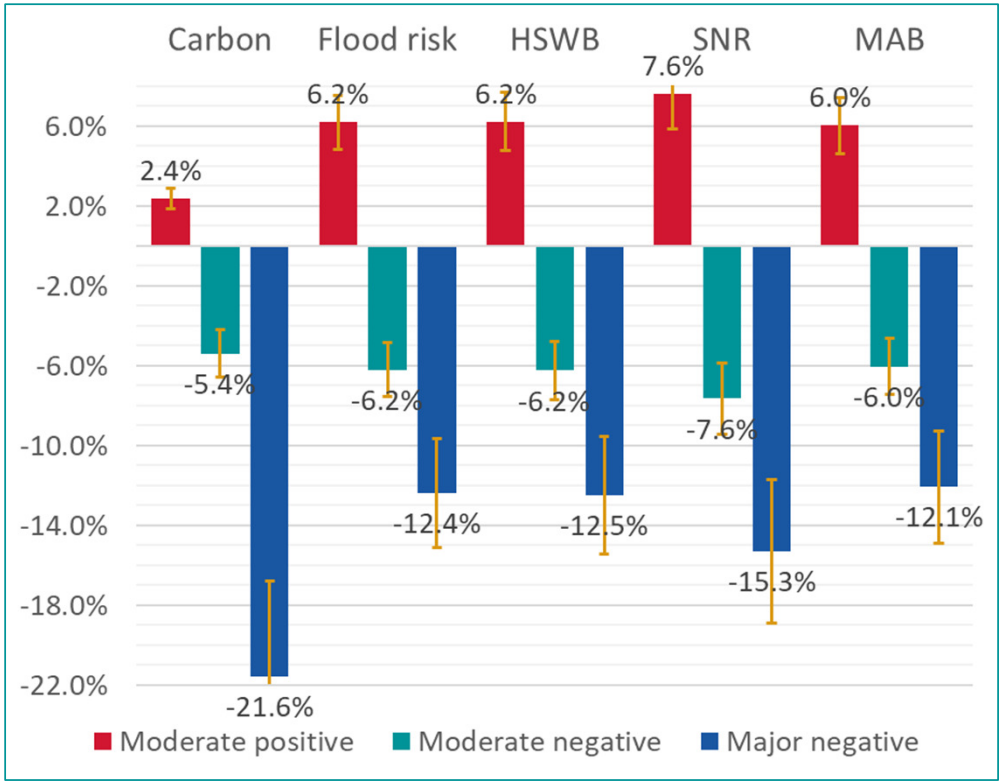


Accent

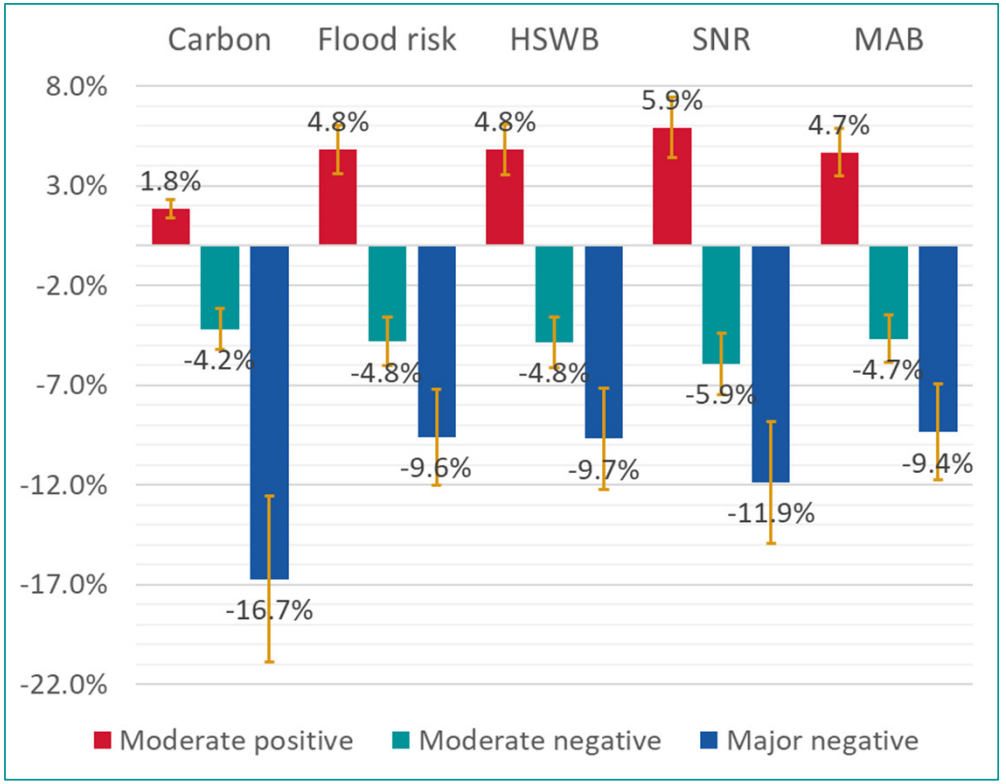
# Willingness to Pay

## CAM REGION: HOUSEHOLDS AND NON-HOUSEHOLDS

### Households




### Non-households




Note: The percentages indicate mean WTP referred to the annual water only bill. The vertical bars indicate 90% confidence intervals calculated using the Delta method. See Appendix for details on the calculation of WTP values. HSWB = Human & social wellbeing; SNR = Habitats for native wildlife and plants; MAB = River flows and water quality.



Accent

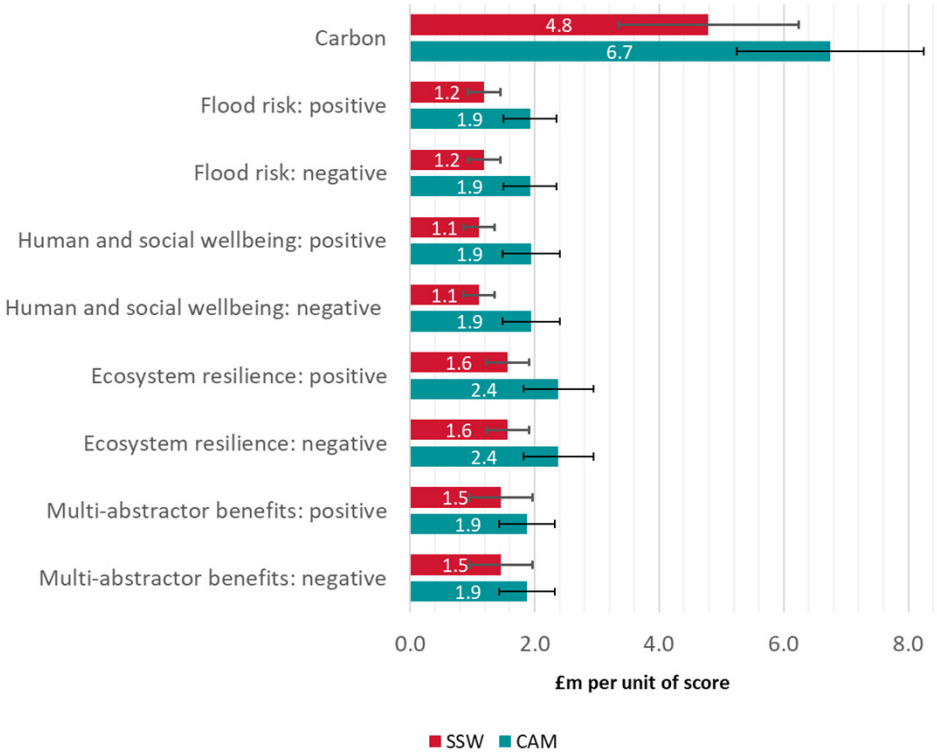
# Differences in valuations by demographics, attitudes and views

In many cases, differences in valuations between customer segments are in line with prior expectations, where held, or at least make intuitive sense

- Customers struggling to pay household bills had lower valuations, on average, of 'Carbon emissions' (SSW), 'Flood risk' (SSW and CAM), 'Human & social wellbeing' (CAM), and 'Habitats for native wildlife and plants' (CAM) than those who always paid their bills on time
- Customers (both SSW and CAM) who preferred keeping customer bills as low as possible to investing more now for the long-term future (8 or above on a 0-10 slider scale) had lower valuations of most attributes relative to those who were less concerned about keeping bills down
- SSW customers who were concerned about reducing carbon emissions (8-10 on a 1-10 scale) had a higher valuation of 'Carbon emissions' than those who were less concerned*
- 'Habitats for native wildlife and plants' was valued more highly by customers (both SSW and CAM) who agreed (8-10 on a 0-10 scale) that 'protecting lakes, rivers, reservoirs, fish and other aquatic plants and wildlife was really important to me' and by CAM customers who preferred 'looking after the needs of the natural environment first, by not taking too much water out of rivers/streams or underground sources' (8-10 on a 0-10 slider scale) compared to 'ensuring all customers have all the water they want to use at an affordable price'
- 'River flows and water quality' was valued more highly by CAM customers who preferred 'looking after the needs of the natural environment first, by not taking too much water out of rivers/streams or underground sources' (8-10 on a 0-10 slider scale) compared to 'ensuring all customers have all the water they want to use at an affordable price'.

* This question was not asked of participants from the CAM and SSW customer panels to shorten the questionnaire for these participants

# WRW ValueStream tool: Decision metric weights by SSC supply region




Note: See Appendix for details on the calculation of preference weights. The bars indicate 90% confidence intervals.

## INTERPRETATION OF WEIGHTS

- Weights indicate the cost equivalent (in £m) of a one unit change in the score of each metric.
- E.g. Carbon is measured in £m using BEIS shadow prices of carbon; hence values greater than 1.0, as here, indicate that customers valued carbon emissions more than the BEIS shadow prices.
- For all other metrics, scores range from -100 (Major negative impact) to 0 (No impact) to +100 (Major positive impact).
- So, an option with a Major negative impact on Flood risk would have to be at least £69m cheaper (in SSW region) than an option with No impact on Flood risk to be selected by ValueStream, all else equal.

## KEY FINDING

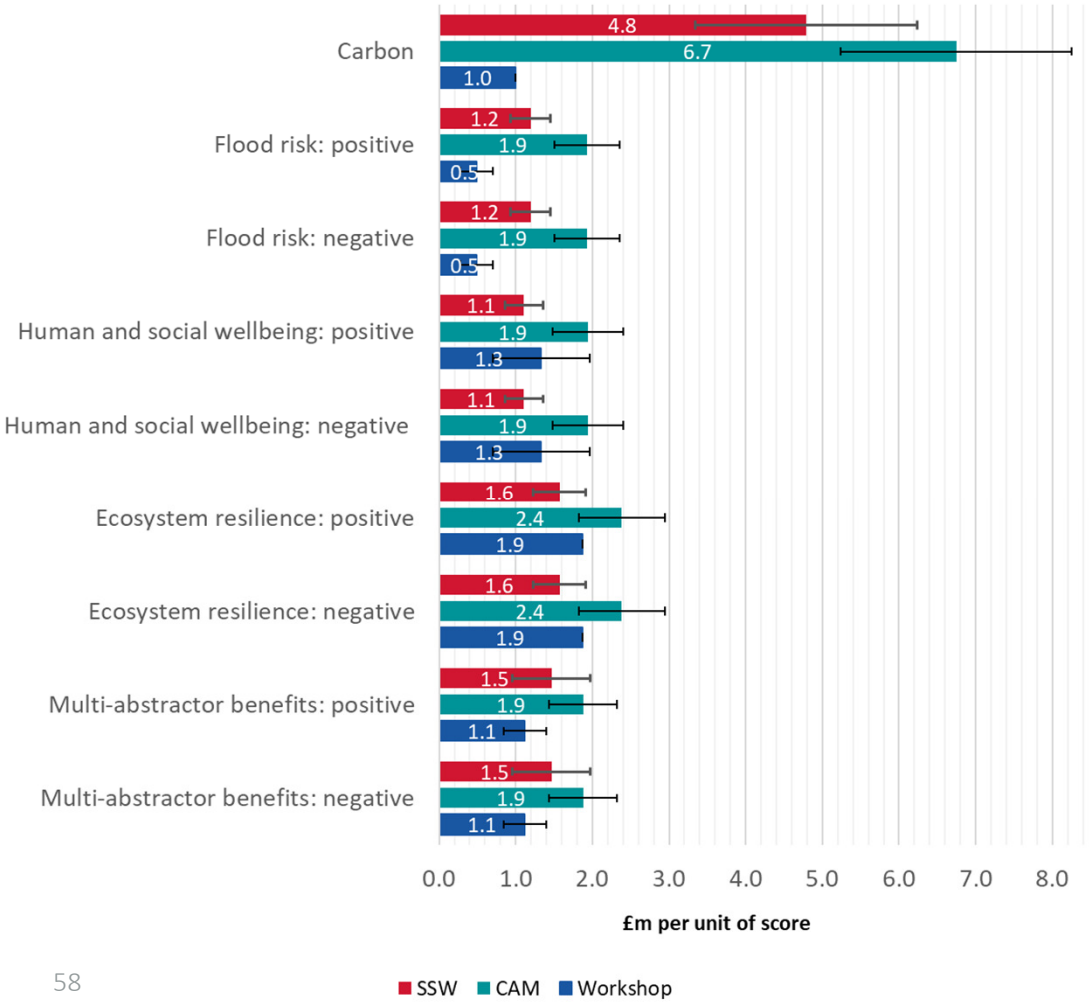
- CAM customers had higher valuations compared to SSW customers



Accent

# Survey-derived weights compared to stakeholder workshop-derived weights

## See Appendix B and C for details of methodology




### INTERPRETATION

- Different weights were established at the WRW workshop held in 2021 depending on whether metrics were scored using the Strategic Environmental Assessment (SEA) or the Natural Capital Assessment (NCA). This is because weights were agreed to be proportional to the number of sub-metrics, and these often differed between SEA and NCA.
- The Workshop results in the chart show the mid point of the SEA-based and NCA-based weights, with the error bar showing the range between the two.

### KEY FINDINGS

- Carbon weights substantially higher than workshop weight (which was based directly on BEIS shadow prices of carbon)
- Flood risk weights higher than workshop for CAM customers
- Human & social wellbeing weights lower than workshop for SSW
- Ecosystem resilience weights lower for both SSW and CAM customers
- Multi-abstractor benefits weights in line with those from workshop.



Accent

# What impacted on option selection:

| Strong environmental outlook | Desire to limit flooding risk | Local environment trumps carbon emissions |
|---|---|---|
| *I'd rather pay more if the natural habitat and animals have to suffer/pay the price. Enough of taking from them!*<br><br>*Because having a positive impact on natural habitats and wildlife is of primary importance, and the additional cost per year is not excessive. Although moderate negative impact of river flows and water quality is a concern.*<br><br>*With global warming having affecting all life and plants we need to ensure the future of the planet.*<br><br>*Flood risk was major in B so didn't want that. Carbon impact on A wasn't too bad.*<br><br>*Environment is a top priority with me and I think that we need to support measures that can ensure that environment and climate change/emergency are not exacerbated.*<br><br>*Minimising impact on the environment is important to me - the environment will be around long after we are gone, it needs protecting for future generations.*<br><br>*I am really into wild life and reserving it at all cost and I believe option a had the least negative impact on nature and wildlife in the long run.* | *NO improvement for flood risk with Option B. In this area this needs to be addressed. We have all seen the maps of a rise in sea level and how it will affect East Anglia - and yet a MILLION new dwellings to be built here - these are not just buildings- they will contain families whose lives will be impacted by flood!! Not very keen on the Carbon Reduction major impact of Option A because it doesn't say if this will be offsetting- which can be a wriggle out of ACTUALLY reducing Carbon- but overall Option A.*<br><br>*I don't want to increase the risk of flood.*<br><br>*As I live near River Cam I'm always looking at flood risk first so there was no other choice.*<br><br>*Worried about flooding.* | *Improving carbon emissions doesn't seem a good enough reason to have major negative impacts on water quality, humans, and wildlife. I would prefer to minimise the damage to the local ecology.*<br><br>*River flow and water quality with no increased risk of flooding are more the important criteria. And, whilst you have to be seen to consider it, carbon issues are minimal and in the whole scheme of things, should be dismissed.*<br><br>*The two most important categories in my opinion are water quality/flow and wildlife/environment; option B was worse in the two categories. Although carbon emissions were worse in option A, this was only a moderate change.*<br><br>*Whilst option B shows that it would significantly reduce carbon emissions, it also says it would have a negative impact on wildlife and plants. This is why I have chose option A as it will have a more positive effect on wildlife and plants.* |

## What impacted on option selection:

### A desire not to increase bills

*We haven't had any problems, the service that we have is adequate for our needs. No need to spend more if we don't need to.*

*At this time there is a large squeeze on incomes therefore prudence in raised costs are what I prefer.*

*I am retired and rely on my pension to live. Heating or eating!*

*All utilities are going up. Need to be realistic.*

*The cost of living is so high that every option within water companies needs to be considered before passing on bill increases to the customer.*

*At the moment will rising costs in most areas I have had to select the cheaper option as a single mum working for the NHS and on universal credit I cannot afford increasing prices.*

*Mainly price as a pensioner money is tight.*

*For a lot of people bills are the most worrying thing of all so to keep them down is a must this is why I selected this option.*

*Think we pay enough as it is it's about the water companies managing the budget and repairing leaking pipes.*

*Because of cost of bills and people being able to afford the cost of living. Wages don't go up more than 1 or 2percent and utilities go up 20percent overall putting people in poverty. Putting people before prices isn't good.*

*'I bet deep inside everyone cares about the environment but the reality affords you only to think about what you gonna put on the table for dinner first. That's why I selected this option. The 4% is more affordable than 8%.*

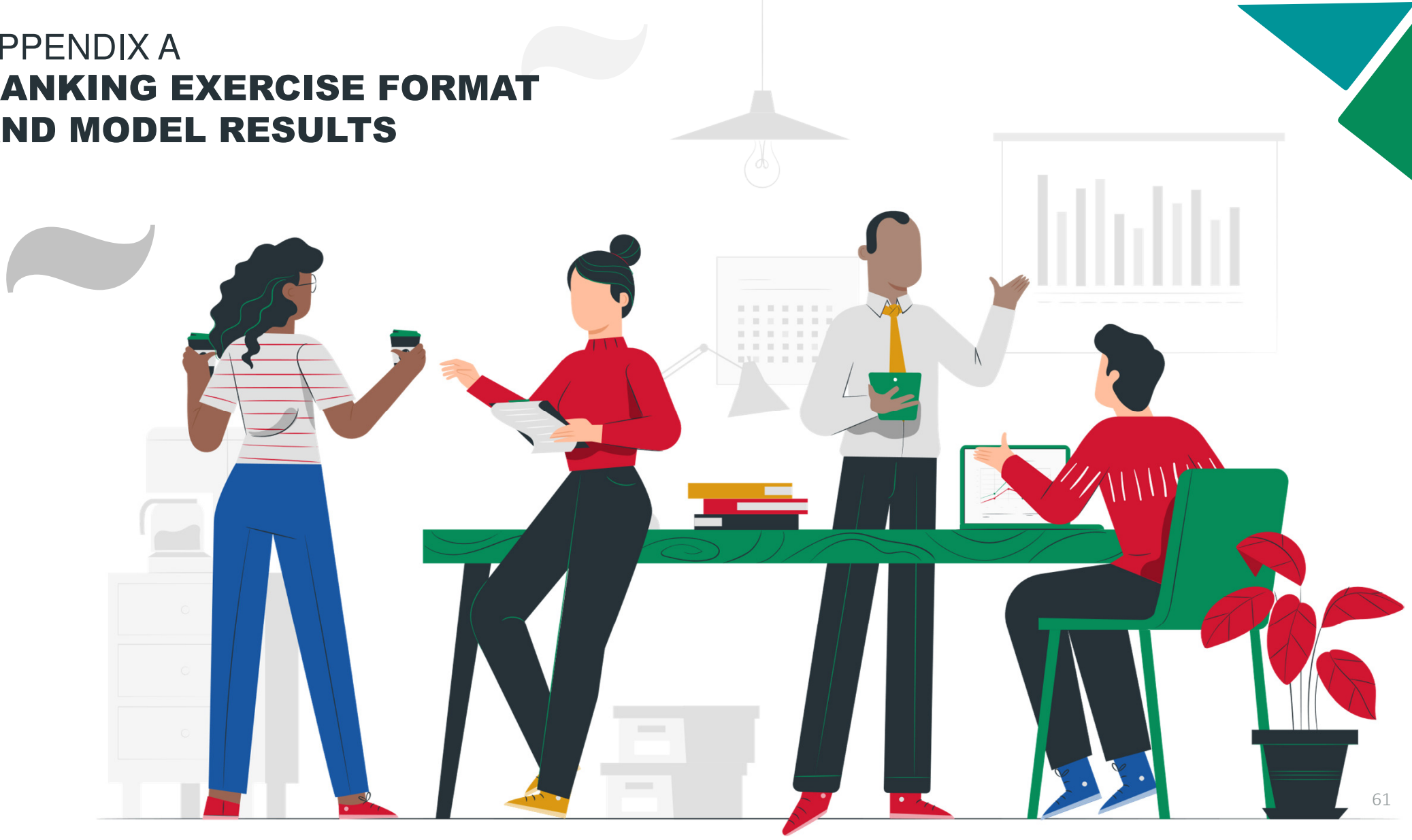
## Reassurance needed that the additional money will be spent on stated improvements

*I don't mind payments increasing as long as it's for the environment and not profit*

*Even though bills will go up, which I'm not particularly happy about, the overall benefits outweighs that additional cost. Although I feel water companies should share the burden via their profits and dividend payments to shareholders. And not spend the extra money on profits*

*We are facing a climate crisis and need to act now even if it means paying more. Unfortunately water has been privatised and the interests of shareholders are more important to water companies than the environment. They have to make a profit and get away with poor environmental performance. The Environment Agency doesn't have the staff to police infringements. Rivers in a shameful state. Water companies supporting unsustainable development by over abstraction. I need to know this increase is doing to be spent in the stated way*

# APPENDIX A
# RANKING EXERCISE FORMAT AND MODEL RESULTS



# Options Ranking Econometric Model Results

## SSW REGION: HOUSEHOLDS

| Choice | Coef. | Std.Err | Z | P value | Lower | Upper |
|---|---|---|---|---|---|---|
| Mean | | | | | | |
| Transfer from other regions | -0.846 | 0.6555 | -1.29 | 0.197 | -2.131 | 0.438 |
| Take more from ground | -0.045 | 0.5891 | -0.08 | 0.939 | -1.199 | 1.110 |
| Take more from rivers | -0.788 | 0.7102 | -1.11 | 0.267 | -2.180 | 0.604 |
| Increase size of reservoirs | 0.860 | 0.2836 | 3.03 | 0.002 | 0.304 | 1.416 |
| Recycle at homes/businesses | 1.541 | 0.2026 | 7.60 | 0.000 | 1.144 | 1.938 |
| Recycle indirectly | 1.411 | 0.1718 | 8.21 | 0.000 | 1.074 | 1.748 |
| Reduce leakage | 2.720 | 0.1885 | 14.43 | 0.000 | 2.351 | 3.089 |
| Reduce use through education | 1.773 | 0.1797 | 9.87 | 0.000 | 1.421 | 2.126 |
| Reduce use through metering | 0.987 | 0.2676 | 3.69 | 0.000 | 0.462 | 1.511 |
| | | | | | | |
| Std deviation | | | | | | |
| Transfer from other regions | 2.170 | 0.6401 | 3.39 | 0.001 | 0.915 | 3.424 |
| Take more from ground | 1.597 | 0.7461 | 2.14 | 0.032 | 0.135 | 3.059 |
| Take more from rivers | 1.419 | 0.6937 | 2.05 | 0.041 | 0.060 | 2.779 |
| Increase size of reservoirs | -1.565 | 0.4465 | -3.51 | 0.000 | -2.440 | -0.690 |
| Recycle at homes/businesses | 0.641 | 0.5524 | 1.16 | 0.246 | -0.442 | 1.724 |
| Recycle indirectly | 0.061 | 0.7226 | 0.08 | 0.933 | -1.356 | 1.477 |
| Reduce leakage | 1.063 | 0.2615 | 4.07 | 0.000 | 0.551 | 1.576 |
| Reduce use through education | -0.809 | 0.4033 | -2.01 | 0.045 | -1.599 | -0.019 |
| Reduce use through metering | 1.482 | 0.4456 | 3.33 | 0.001 | 0.608 | 2.355 |
| | | | | | | |
| No of observations | 13,253 | | | | | |
| No of respondents | 493 | | | | | |
| Pseudo $R^2$ | 0.12 | | | | | |

Mixed logit estimates. The sign of the estimated standard deviations is irrelevant.

- Participants asked to indicate top three priorities
- Omitted option: Impose restrictions (serves as base)
- Data organised as 'exploded choice sets', yielding three choices for each participant (preferred option from a set of 10 options; preferred option from the remaining 9 options; etc.) and 13,253 observations for n = 493 household participants (a few participants did not indicate all three ranks)
- The model fits the data relatively well (pseudo $R^2$ = 0.12)
- Individual-level coefficients were derived for each random coefficient and every participant
- Priority scores were calculated at the individual level by dividing each option's exponentiated coefficient by the sum of exponentiated coefficients over all options (including the omitted base option), giving a measure on a 0-100 scale
- Individual-level priority scores were averaged over the relevant sub-samples to obtain segment rankings

# Options Ranking Econometric Model Results

## SSW REGION: NON-HOUSEHOLDS

| Choice | Coef. | Std.Err | Z | P value | Lower | Upper |
|---|---|---|---|---|---|---|
| Mean | | | | | | |
| Transfer from other regions | 1.033 | 0.7762 | 1.33 | 0.183 | -0.488 | 2.555 |
| Take more from ground | 0.976 | 0.8510 | 1.15 | 0.252 | -0.692 | 2.644 |
| Take more from rivers | 0.763 | 0.9380 | 0.81 | 0.416 | -1.075 | 2.601 |
| Increase size of reservoirs | 2.210 | 0.5809 | 3.81 | 0.000 | 1.072 | 3.349 |
| Recycle at homes/businesses | 1.649 | 0.7861 | 2.10 | 0.036 | 0.108 | 3.190 |
| Recycle indirectly | 0.548 | 1.1467 | 0.48 | 0.633 | -1.699 | 2.796 |
| Reduce leakage | 4.152 | 1.0475 | 3.96 | 0.000 | 2.099 | 6.205 |
| Reduce use through education | 2.213 | 0.7543 | 2.93 | 0.003 | 0.734 | 3.691 |
| Reduce use through metering | 1.229 | 0.8538 | 1.44 | 0.150 | -0.444 | 2.903 |
| | | | | | | |
| Std deviation | | | | | | |
| Transfer from other regions | 0.722 | 1.1301 | 0.64 | 0.523 | -1.493 | 2.937 |
| Take more from ground | 1.106 | 1.1191 | 0.99 | 0.323 | -1.087 | 3.299 |
| Take more from rivers | 0.862 | 1.2680 | 0.68 | 0.497 | -1.623 | 3.347 |
| Increase size of reservoirs | 1.017 | 0.8685 | 1.17 | 0.242 | -0.686 | 2.719 |
| Recycle at homes/businesses | 3.327 | 1.2511 | 2.66 | 0.008 | 0.874 | 5.779 |
| Recycle indirectly | -4.826 | 1.8698 | -2.58 | 0.010 | -8.491 | -1.161 |
| Reduce leakage | 4.621 | 1.4024 | 3.29 | 0.001 | 1.872 | 7.369 |
| Reduce use through education | 3.741 | 1.3128 | 2.85 | 0.004 | 1.168 | 6.314 |
| Reduce use through metering | -2.727 | 1.1083 | -2.46 | 0.014 | -4.899 | -0.555 |
| | | | | | | |
| No of observations | 2,079 | | | | | |
| No of respondents | 77 | | | | | |
| Pseudo $R^2$ | 0.12 | | | | | |

Mixed logit estimates. The sign of the estimated standard deviations is irrelevant.

- Participants asked to indicate top three priorities
- Omitted option: Impose restrictions (serves as base)
- Data organised as 'exploded choice sets', yielding three choices for each participant (preferred option from a set of 10 options; preferred option from the remaining 9 options; etc.) and 2,079 observations for n = 77 non-household participants
- The model fits the data relatively well (pseudo $R^2$ = 0.12), and, despite the small sample size four mean coefficients are statistically significant
- Preferences vary across the NHH customer base as indicated by the highly statistically significant standard deviations for five of the options
- Priority scores were calculated at the individual level in the same way as for households
- Individual-level priority scores were averaged over the relevant sub-samples to obtain segment rankings

# Statistically Significant Differences in Priorities

## SSW REGION: HOUSEHOLDS

**1ST REDUCE LEAKAGE**: No significant differences between segments

**2ND REDUCE USE THROUGH EDUCATION**: No significant differences between segments

**3RD RECYCLE AT HOMES/BUSINESSES**: No significant differences between segments

**4TH RECYCLE INDIRECTLY**

| | |
|---|---|
| Customers aged 65 yrs + (5th)<br>Service issues: Limescale (5th) | |

**5TH REDUCE USE THROUGH METERING**

| | |
|---|---|
| Social grades C1&C2 (6th)<br>HH size: 3 (6th)<br>Bills: Struggling (6th)<br>Water use: Don't think about it (6th)<br>Unmetered customers (6th)<br>Service issues: Change to taste/smell (6th); Limescale (6th); Low pressure (6th) | Tame Anker and Mease (5th)<br>Bills: Always on time (5th)<br>Metered customers (4th) |

Significant differences between any segment and the complement 'Other' (e.g., social grades A&B vs C1&C2&D&E combined): a) rank difference of at least one place; and b) difference between priority scores statistically significant at the 5% level

# Statistically Significant Differences in Priorities

## SSW REGION: HOUSEHOLDS

### 6TH INCREASE SIZE OF RESERVOIRS

| | |
|---|---|
| Bills: Always on time (6th)<br><br>Metered customers (6th) | Bills: Struggling (4th)<br>Water use: Don't think about it (3rd)<br>Unmetered customers (5th)<br>Service issue: Limescale (4th) |

### 7TH TAKE MORE FROM GROUND: No significant differences between segments

### 8TH TRANSFER FROM OTHER REGIONS

| | |
|---|---|
| Severn Middle Worcestershire (9th)<br>Female customers (9th)<br>HH size: 4 or more (10th) | Male customers (8th)<br><br>Service issue: Limescale (7th) |

### 9TH IMPOSE RESTRICTIONS

| | |
|---|---|
| Male customers (9th)<br><br>Service issue: Limescale (9th) | Customers aged 18-34 yrs (8th)<br>Female customers (8th)<br>HH size: 4 or more (8th)<br>Water use: Don't want to waste (8th) |

### 10TH TAKE MORE FROM RIVERS: No significant differences between segments

Significant differences between any segment and the complement 'Other' (e.g., social grades A&B vs C1&C2&D&E combined): a) rank difference of at least one place; and b) difference between priority scores statistically significant at the 5% level

# Options Ranking Econometric Model Results

## CAM REGION: HOUSEHOLDS

| Choice | Coef. | Std.Err | Z | P value | Lower | Upper |
|---|---|---|---|---|---|---|
| Mean | | | | | | |
| Transfer from other regions | -1.109 | 0.5981 | -1.85 | 0.064 | -2.281 | 0.063 |
| Take more from ground | -1.889 | 0.8330 | -2.27 | 0.023 | -3.522 | -0.256 |
| Build regional reservoir | 0.351 | 0.3267 | 1.07 | 0.283 | -0.290 | 0.991 |
| Recycle at homes/businesses | 0.975 | 0.2646 | 3.69 | 0.000 | 0.456 | 1.494 |
| Recycle indirectly | 0.759 | 0.1926 | 3.94 | 0.000 | 0.381 | 1.136 |
| Reduce leakage | 2.684 | 0.2291 | 11.72 | 0.000 | 2.235 | 3.133 |
| Reduce use through education | 1.042 | 0.2158 | 4.83 | 0.000 | 0.619 | 1.465 |
| Reduce use through metering | 1.284 | 0.1996 | 6.43 | 0.000 | 0.893 | 1.675 |
| | | | | | | |
| Std deviation | | | | | | |
| Transfer from other regions | 3.239 | 0.7328 | 4.42 | 0.000 | 1.803 | 4.676 |
| Take more from ground | 2.405 | 0.7114 | 3.38 | 0.001 | 1.010 | 3.799 |
| Build regional reservoir | 2.618 | 0.5361 | 4.88 | 0.000 | 1.567 | 3.669 |
| Recycle at homes/businesses | 0.679 | 0.8705 | 0.78 | 0.435 | -1.027 | 2.385 |
| Recycle indirectly | -0.256 | 0.7203 | -0.36 | 0.722 | -1.668 | 1.156 |
| Reduce leakage | 1.637 | 0.3516 | 4.66 | 0.000 | 0.948 | 2.327 |
| Reduce use through education | 1.474 | 0.4196 | 3.51 | 0.000 | 0.652 | 2.297 |
| Reduce use through metering | 1.556 | 0.4053 | 3.84 | 0.000 | 0.762 | 2.351 |
| | | | | | | |
| No of observations | 9,412 | | | | | |
| No of respondents | 394 | | | | | |
| Pseudo $R^2$ | 0.11 | | | | | |

Mixed logit estimates. The sign of the estimated standard deviations is irrelevant.

- Participants asked to indicate top three priorities
- Omitted option: Impose restrictions (serves as base)
- Data organised as 'exploded choice sets', yielding three choices for each participant (preferred option from a set of 9 options; preferred option from the remaining 8 options; etc.) and 9,412 observations for n = 394 household participants (a few participants did not indicate all three ranks)
- The model fits the data relatively well (pseudo $R^2$ = 0.11)
- Most mean and standard deviation coefficients are highly statistically significant
- Individual-level coefficients were derived for each random coefficient and every participant
- Priority scores were calculated at the individual level by dividing each option's exponentiated coefficient by the sum of exponentiated coefficients over all options (including the omitted base option), giving a measure on a 0-100 scale
- Individual-level priority scores were averaged over the relevant sub-samples to obtain segment rankings

# Options Ranking Econometric Model Results

## CAM REGION: NON-HOUSEHOLDS

| Choice | Coef. | Std.Err | Z | P value | Lower | Upper |
|---|---|---|---|---|---|---|
| Mean | | | | | | |
| Transfer from other regions | -0.089 | 1.4060 | -0.06 | 0.950 | -2.845 | 2.667 |
| Take more from ground | -1.559 | 2.2946 | -0.68 | 0.497 | -6.056 | 2.938 |
| Build regional reservoir | 1.028 | 0.8989 | 1.14 | 0.253 | -0.734 | 2.790 |
| Recycle at homes/businesses | 1.357 | 0.7219 | 1.88 | 0.060 | -0.058 | 2.772 |
| Recycle indirectly | -0.202 | 1.4030 | -0.14 | 0.886 | -2.952 | 2.548 |
| Reduce leakage | 3.506 | 0.9885 | 3.55 | 0.000 | 1.569 | 5.444 |
| Reduce use through education | 1.723 | 0.6279 | 2.74 | 0.006 | 0.493 | 2.954 |
| Reduce use through metering | -0.169 | 1.4308 | -0.12 | 0.906 | -2.973 | 2.635 |
| | | | | | | |
| Std deviation | | | | | | |
| Transfer from other regions | 2.710 | 2.0765 | 1.31 | 0.192 | -1.359 | 6.780 |
| Take more from ground | 2.984 | 2.2403 | 1.33 | 0.183 | -1.407 | 7.375 |
| Build regional reservoir | 2.283 | 1.1541 | 1.98 | 0.048 | 0.021 | 4.545 |
| Recycle at homes/businesses | 2.495 | 1.4825 | 1.68 | 0.092 | -0.411 | 5.401 |
| Recycle indirectly | -3.644 | 2.2823 | -1.60 | 0.110 | -8.118 | 0.829 |
| Reduce leakage | -1.970 | 1.1181 | -1.76 | 0.078 | -4.162 | 0.221 |
| Reduce use through education | 1.634 | 1.4982 | 1.09 | 0.275 | -1.302 | 4.571 |
| Reduce use through metering | 3.201 | 1.7706 | 1.81 | 0.071 | -0.270 | 6.671 |
| | | | | | | |
| No of observations | 1,202 | | | | | |
| No of respondents | 51 | | | | | |
| Pseudo $R^2$ | 0.11 | | | | | |

Mixed logit estimates. The sign of the estimated standard deviations is irrelevant.

- Participants asked to indicate top three priorities
- Omitted option: Impose restrictions (serves as base)
- Data organised as 'exploded choice sets', yielding three choices for each participant (preferred option from a set of 9 options; preferred option from the remaining 8 options; etc.) and 1,202 observations for n = 51 non-household participants (a few participants did not indicate all three ranks)
- The model fits the data relatively well (pseudo $R^2$ = 0.11)
- Three mean coefficients are highly or borderline statistically significant
- Three mean coefficients are very small and far from being statistically significant, which indicates that, at the mean, the relevant options were not considered to be substantially more or less important than imposing restrictions on water use
- Priority scores were calculated at the individual level in the same way as for households
- Individual-level priority scores were averaged over the relevant sub-samples to obtain segment rankings

# Statistically Significant Differences in Priorities

## CAM REGION: HOUSEHOLDS

**1ST REDUCE LEAKAGE**: No significant differences between segments

**2ND REDUCE USE THROUGH METERING**

| | |
|---|---|
| Water use: Don't want to waste (3rd)<br>Unmetered customers (4th) | Metered customers (2nd) |

**3RD BUILD REGIONAL RESERVOIR**

| | |
|---|---|
| | Customers aged 65 yrs + (2nd) |

**4TH REDUCE USE THROUGH EDUCATION**

| | |
|---|---|
| Customers aged 65 yrs + (5th)<br>Unmetered customers (5th)<br>Service issue: Limescale (4th) | Metered customers (4th) |

**5TH TRANSFER FROM OTHER REGIONS**: No significant differences between segments

**6TH RECYCLE AT HOMES/BUSINESSES**

| | |
|---|---|
| Customers aged 65 yrs + (6th) | |

**7TH RECYCLE INDIRECTLY**: No significant differences between segments

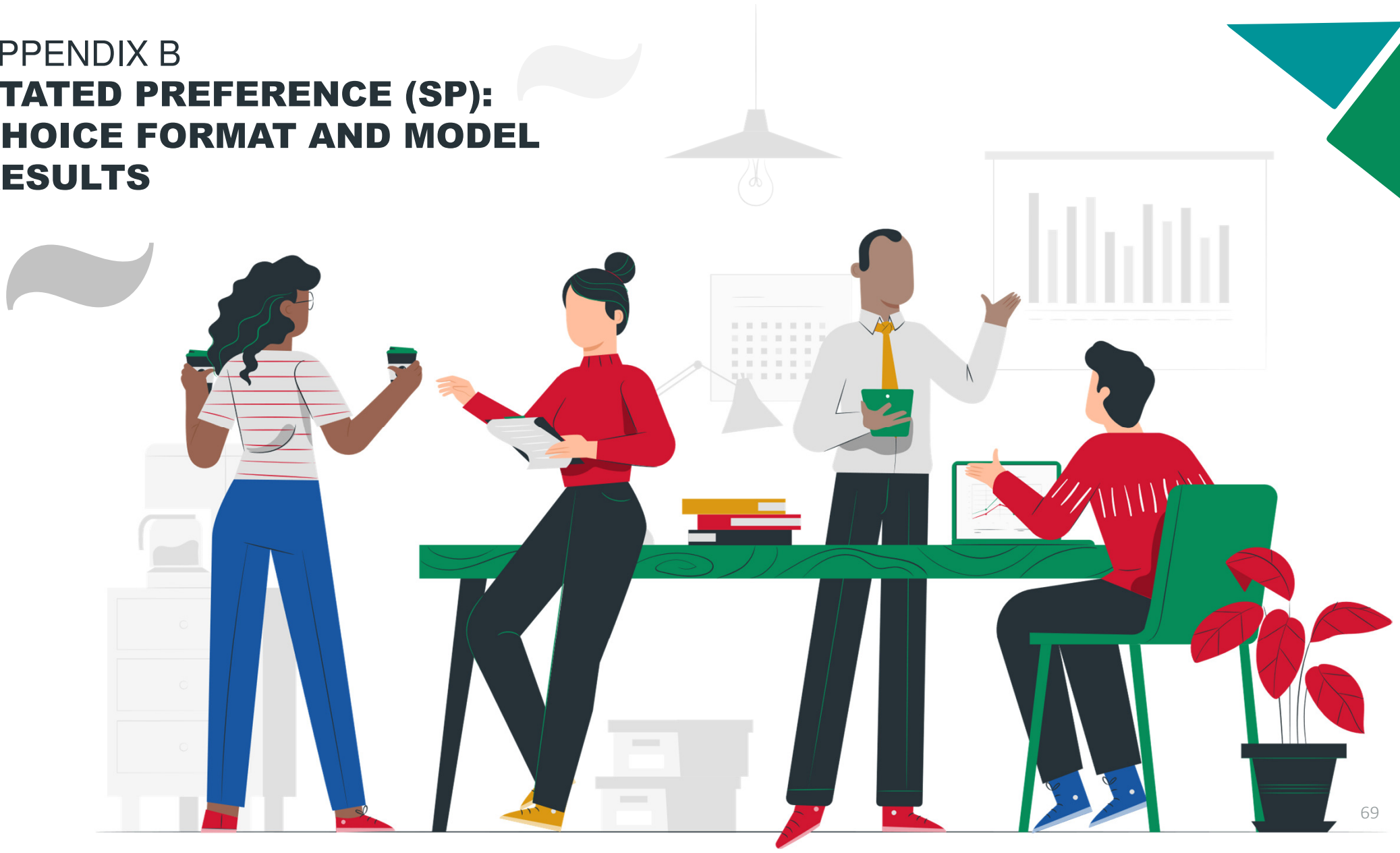
**8TH IMPOSE RESTRICTIONS**: No significant differences between segments

**9TH TAKE MORE FROM GROUND**: No significant differences between segments

Significant differences between any segment and the complement 'Other' (e.g., social grades A&B vs C1&C2&D&E combined): a) rank difference of at least one place; and b) difference between priority scores statistically significant at the 5% level

APPENDIX B

# STATED PREFERENCE (SP): CHOICE FORMAT AND MODEL RESULTS



# SP Econometric Model Results

## SSW REGION: HOUSEHOLDS AND NON-HOUSEHOLDS

| Choice | Coef. | Std.Err | Z | P value | Lower | Upper |
|---|---|---|---|---|---|---|
| Mean | | | | | | |
| Bill change | -0.0223 | 0.0010 | -21.89 | 0.000 | -0.0243 | -0.0203 |
| Bill change × Business customer | -0.0991 | 0.0090 | -11.01 | 0.000 | -0.1167 | -0.0815 |
| Bill change × South Staffs | -0.0209 | 0.0058 | -3.58 | 0.000 | -0.0323 | -0.0094 |
| Bill change × Severn Trent | -0.0081 | 0.0014 | -5.60 | 0.000 | -0.0109 | -0.0053 |
| Carbon | 0.0115 | 0.0007 | 16.95 | 0.000 | 0.0101 | 0.0128 |
| Carbon × South Staffs | 0.0089 | 0.0028 | 3.17 | 0.002 | 0.0034 | 0.0143 |
| Flood risk | 0.0051 | 0.0003 | 19.22 | 0.000 | 0.0045 | 0.0056 |
| HSWB | 0.0047 | 0.0003 | 16.88 | 0.000 | 0.0042 | 0.0052 |
| SNR | 0.0067 | 0.0003 | 21.55 | 0.000 | 0.0061 | 0.0073 |
| MAB | 0.0041 | 0.0003 | 15.77 | 0.000 | 0.0036 | 0.0047 |
| MAB × South Staffs | 0.0021 | 0.0011 | 1.85 | 0.065 | -0.0001 | 0.0043 |
| | | | | | | |
| Std deviation | | | | | | |
| Carbon | 0.0113 | 0.0013 | 8.38 | 0.000 | 0.0087 | 0.0139 |
| Flood risk | -0.0046 | 0.0005 | -9.18 | 0.000 | -0.0056 | -0.0036 |
| HSWB | 0.0041 | 0.0007 | 6.07 | 0.000 | 0.0028 | 0.0054 |
| SNR | 0.0067 | 0.0005 | 14.90 | 0.000 | 0.0059 | 0.0076 |
| MAB | -0.0046 | 0.0005 | -8.64 | 0.000 | -0.0056 | -0.0035 |
| | | | | | | |
| No of observations | 34,752(2,172*8*2) | | | | | |
| No of respondents | 2,172(765 [ST] + 837 [UU] + 570 [SSW]) | | | | | |
| Pseudo $R^2$ | 0.14 | | | | | |

Note: Mixed logit estimates. The random coefficients have independent normal distributions. The sign of the estimated standard deviations is irrelevant. The sample combines household and non-household customers of South Staffs Water (SSW), Severn Trent Water (ST), and United Utilities Water (UU).

- Joint mixed logit model combining households and non-households from South Staffs Water, United Utilities, and Severn Trent. Weights were applied to reflect relative wholesale revenue contributions from each segments.
- The attribute levels were translated to scores obtained from "ValueStream1_R05-00", except for Carbon. The scores for Carbon were derived by calculating the NPV of carbon emissions equivalent to each of the levels of the metric based on the time series of 'Central' values contained in BEIS (2021) 'Supplementary appraisal guidance on valuing energy use and greenhouse gas (GHG) emissions'.
- Bill changes are measured in £ per household per year for households and in percentage points of the annual combined water and wastewater bill for non-households.
- The initial (conditional logit) specification included a set of interaction terms between attribute levels (including bill change) and dummy variables for companies and non-household customers. Statistically not significant interactions were dropped in a stepwise procedure.
- The signs of the coefficients are all in line with expectations and the model provides a good fit to the data.
- There is significant heterogeneity in preferences as indicated by the standard deviation coefficient estimates.

# Statistically Significant Differences in Priorities

## SSW REGION

| Carbon emissions | |
|---|---|
| Severn Middle Worcestershire<br>Bills: Struggling<br><br>Visited rivers, lakes or reservoirs within the last year: No<br>Keeping bills as low as possible (vs investing now for the future) rated above 8 on a 0-10 scale (slider)<br>Concern carbon emissions: 1-7 | Customers aged 18-34 yrs<br><br>Bills: Always on time<br>Service issue: Discolouration<br>Visited rivers, lakes or reservoirs within the last year: Yes<br>Keeping bills as low as possible (vs investing now for the future) rated below 8 on a 0-10 scale (slider)<br>Concern carbon emissions: Concerned 8-10 |

| Flood risk | |
|---|---|
| Bills: Struggling<br><br>Water use: Want to keep bill down<br><br>Keeping bills as low as possible (vs investing now for the future) rated above 8 on a 0-10 scale (slider) | Tame Anker and Mease<br>Bills: Always on time<br>HH income: £1,001+ p.w.<br>Water use: Don't want to waste<br>Service issue: Limescale<br>Keeping bills as low as possible (vs investing now for the future) rated below 8 on a 0-10 scale (slider) |

| Human & social wellbeing | |
|---|---|
| Customers aged 35-64 yrs<br>Male customers<br><br>Service issue: Discolouration<br>Service issue: Loss of supply<br>Concern carbon emissions: Concerned 8-10 | <br><br>Female customers<br>HH income: £722-£1,000 p.w.<br><br><br>Concern carbon emissions: 1-7 |

Customer segments in green (red) cells had, on average, a statistically higher (lower) WTP for the relevant attribute than customers in the corresponding complement segment 'Other' (e.g., customers aged 18-34 vs customers aged 34+). The differences are significant at the 5% level.

# Statistically Significant Differences in Priorities

## SSW REGION (CONT.)

| Habitats for native wildlife and plants | |
|---|---|
| Customers aged 35-64 yrs<br>HH size: 2<br><br>Service issue: Low pressure<br>Protect water resources: 0-7<br>Keeping bills as low as possible (vs investing now for the future) rated above 8 on a 0-10 scale (slider) | Customers aged 18-34 yrs<br><br>Water use: Conscious about it<br><br>Protect water resources: Agree 8-10<br>Keeping bills as low as possible (vs investing now for the future) rated below 8 on a 0-10 scale (slider) |

| River flows and water quality | |
|---|---|
| Severn Middle Worcestershire<br>HH income: £316-£442 p.w.<br><br>Water use: Want to keep bill down<br>Keeping bills as low as possible (vs investing now for the future) rated above 8 on a 0-10 scale (slider) | Tame Anker and Mease<br>HH income: Up to £315 p.w.<br>HH income: £1,001+ p.w.<br>Water use: Conscious about it<br>Keeping bills as low as possible (vs investing now for the future) rated below 8 on a 0-10 scale (slider) |

Customer segments in green (red) cells had, on average, a statistically higher (lower) WTP for the relevant attribute than customers in the corresponding complement segment 'Other' (e.g., customers aged 18-34 vs customers aged 34+). The differences are significant at the 5% level.

# SP Econometric Model Results

## CAM REGION: HOUSEHOLDS AND NON-HOUSEHOLDS

| Choice | Coef. | Std.Err | Z | P value | Lower | Upper |
|---|---|---|---|---|---|---|
| Mean | | | | | | |
| Bill change | -0.0436 | 0.0047 | -9.19 | 0.000 | -0.0529 | -0.0343 |
| Bill change × Non-household | -0.1804 | 0.0297 | -6.08 | 0.000 | -0.2385 | -0.1223 |
| Carbon | 0.0279 | 0.0027 | 10.25 | 0.000 | 0.0226 | 0.0332 |
| Flood risk | 0.0080 | 0.0009 | 8.73 | 0.000 | 0.0062 | 0.0098 |
| HSWB | 0.0080 | 0.0009 | 8.77 | 0.000 | 0.0062 | 0.0098 |
| SNR | 0.0099 | 0.0011 | 8.98 | 0.000 | 0.0077 | 0.0120 |
| MAB | 0.0078 | 0.0009 | 9.04 | 0.000 | 0.0061 | 0.0095 |
| | | | | | | |
| Std deviation | | | | | | |
| Carbon | 0.0242 | 0.0036 | 6.73 | 0.000 | 0.0172 | 0.0313 |
| Flood risk | 0.0071 | 0.0013 | 5.38 | 0.000 | 0.0045 | 0.0097 |
| HSWB | -0.0035 | 0.0028 | -1.25 | 0.210 | -0.0090 | 0.0020 |
| SNR | 0.0103 | 0.0014 | 7.46 | 0.000 | 0.0076 | 0.0131 |
| MAB | 0.0051 | 0.0016 | 3.24 | 0.001 | 0.0020 | 0.0082 |
| | | | | | | |
| No of observations | 7,120(445*8*2) | | | | | |
| No of respondents | 445 | | | | | |
| Pseudo $R^2$ | 0.22 | | | | | |

Note: Mixed logit estimates. The random coefficients have independent normal distributions. The sign of the estimated standard deviations is irrelevant.

- The attribute levels were translated to scores obtained from "ValueStream1_R05-00", except for Carbon. The scores for Carbon were derived by calculating the NPV of carbon emissions equivalent to each of the levels of the metric based on the time series of 'Central' values contained in BEIS (2021) 'Supplementary appraisal guidance on valuing energy use and greenhouse gas (GHG) emissions'.
- Bill changes are measured in £ per household per year for households and in percentage points of the annual combined water and wastewater bill for non-households.
- The same model selection approach was used as for the combined WRW model. The initial (conditional logit) specification included a full set of interaction terms between attribute levels and a non-household dummy. Statistically not significant interactions were dropped in a stepwise procedure.
- The signs of the coefficients are all in line with expectations and the model provides a good fit to the data.
- There is significant heterogeneity in preferences as indicated by the standard deviation coefficient estimates.

# Statistically Significant Differences in Priorities

## CAM REGION

| Carbon emissions | |
|---|---|
| Customers aged 35-64 yrs<br>Keeping bills as low as possible (vs investing now for the future) rated above 8 on a 0-10 scale (slider) | Keeping bills as low as possible (vs investing now for the future) rated below 8 on a 0-10 scale (slider) |

| Flood risk | |
|---|---|
| Bills: Struggling<br>Water use: Want to keep bill down<br>Keeping bills as low as possible (vs investing now for the future) rated above 8 on a 0-10 scale (slider) | Bills: Always on time<br>Keeping bills as low as possible (vs investing now for the future) rated below 8 on a 0-10 scale (slider) |

| Human & social wellbeing | |
|---|---|
| Bills: Struggling<br>Water use: Want to keep bill down | Bills: Always on time |

Customer segments in green (red) cells had, on average, a statistically higher (lower) WTP for the relevant attribute than customers in the corresponding complement segment 'Other' (e.g., customers aged 18-34 vs customers aged 34+). The differences are significant at the 5% level.

# Statistically Significant Differences in Priorities

## CAM REGION (CONT.)

| Habitats for native wildlife and plants | |
|---|---|
| Male customers<br>Bills: Struggling<br>Protect water resources: 0-7<br>Keeping bills as low as possible (vs investing now for the future) rated above 8 on a 0-10 scale (slider)<br>Looking after water resources rated below 8 on 0-10 scale (slider) | Female customers<br>Bills: Always on time<br>Protect water resources: Agree 8-10<br>Keeping bills as low as possible (vs investing now for the future) rated below 8 on a 0-10 scale (slider)<br>Looking after water resources rated above 8 on 0-10 scale (slider) |

| River flows and water quality | |
|---|---|
| Water use: Want to keep bill down<br>Keeping bills as low as possible (vs investing now for the future) rated above 8 on a 0-10 scale (slider)<br>Looking after water resources rated below 8 on 0-10 scale (slider) | HH income: £1,001+ p.w.<br>Keeping bills as low as possible (vs investing now for the future) rated below 8 on a 0-10 scale (slider)<br>Looking after water resources rated above 8 on 0-10 scale (slider) |

Customer segments in green (red) cells had, on average, a statistically higher (lower) WTP for the relevant attribute than customers in the corresponding complement segment 'Other' (e.g., customers aged 18-34 vs customers aged 34+). The differences are significant at the 5% level.

APPENDIX C

# WILLINGNESS TO PAY (WTP) AND PREFERENCE WEIGHT CALCULATIONS

# Calculation of WTP values

- The coefficient estimates from the econometric model are used to derive mean WTP values for the attribute levels
  - for households in terms of £ per household per year per unit score
  - and for businesses as a percentage of the annual combined water and wastewater bill per unit score
- The WTP values for households are translated in terms of % of SSW/CAM's water only bill by multiplying the former values by the score values and then dividing the product by the average annual household water only bill of £153 (SSW)/£148 (CAM).
- The WTP values for non-households are translated in terms of % of SSW/CAM's water only bill by multiplying the former values by the score values and multiplying the product by the ratio of the average annual combined (water and wastewater) bill of £343 (SSW)/£399 (CAM) and the average annual household water only bill of £153 (SSW)/£148 (CAM).

# Calculation of preference weights

- Mean WTP values for the attribute levels as a percentage of SSW/CAM's annual average water only bill for households and businesses were obtained from the estimated econometric models as detailed under 'Calculation of WTP values'.
- The cost-equivalent of the bill impacts for the different attribute levels were then calculated (in £ millions) separately for households and non-households based on a link from supply-demand option costs, measured in £NPV to the customer bill impact measured in % per year, provided by SSC. Using SSC data, it was calculated that 1% on the water bill was equivalent to £22.4million NPV of totex.
- The total cost-equivalent of the bill impacts for the different attribute levels were calculated as the weighted sum of the cost-equivalent of the bill impacts calculated for households and businesses in the previous step, with the weights being the share of households and non-households in the total wholesale revenue of SSC. The share of wholesale revenue attributable to households and non-households was provided by SSC as being 77% and 23% respectively.
- The raw (unadjusted) metric weights were generated by dividing the total cost-equivalent of the bill impacts for the different attribute levels by the scores used for the positive and negative levels of attribute changes.

NPV: Net Present Value

Totex: (Capital Expenditure + Operational Expenditure) approach looks at the total cost of expenditure, over the long-term operating life an asset.

# Calculation of preference weights

- Scaling factors were applied to the raw weights to adjust for differences in company size.
- To calculate the scaled/adjusted weights, we used the following data:
  - The size of the 2050 Water Resources West (WRW) region deficit, measured in Mega litres (ML)/ per day
  - The median-sized scheme in WRW, also measured in ML/day
  - Population in each company area, derived from GIS analysis of Ofwat boundary shapefiles and Census 2011 data.
- The scaling factors for SSW, UU and SVT were calculated to be equal to the number of median-sized supply-demand options needed to address the WRW deficit, allocated across WRW companies in proportion to the population in each company's supply area. For CAM, a comparable scaling factor was obtained by applying the ratio of CAM to SSW population to the SSW scaling factor.
- These scaling factors can be interpreted as the number of average-sized schemes needed to meet the 2050 deficit for all three companies if this deficit were allocated proportionally to population across companies. Applying these scaling factors is consistent with the interpretation of customers' choice data as reflecting preferences across metrics for an average sized scheme.
- The SSC weights are a population weighted average of SSW and CAM weights.