The voice for water consumers
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Keen to go Green? Customer preferences and priorities for waste water solutions

Insight report by Yonder Consulting
December 2023

ccw.org.uk

Foreword

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As water companies publish their business plans for the coming years, much focus will be on their plans to renew and develop sewerage infrastructure. The role that so-called ‘nature-based’ solutions will play in this – solutions designed to work in concert with the natural environment – is increasingly being discussed, in the context of climate change and concern around pollution of the environment.

The purpose of this research was to understand customers’ views on different types of solutions, and what is driving these views. In exploring these questions, we have gained a clearer picture of peoples’ priorities, as well as what trade-offs they are willing to make when it comes to more ‘nature-based’ types of solutions.

Our research tested various scenarios for potential sewage treatment solutions, encompassing both traditional hard-engineered and nature-based options. We also tested real-life case studies via a series of focus groups.

As costs and bills continue to rise, it will come as little surprise that, by a significant margin, cost was the single most important attribute for consumers when it came to choosing what type of solution they preferred.

However, despite this initial prioritisation of cost, when presented with the full scenarios for different solutions, customers are clearly willing to make trade-offs. They preferred ‘nature-based’ solutions over a man-made equivalent in every instance, at every cost level we tested. Even at four times the impact on bills compared to the hard-engineered equivalent, customers still chose the option which conferred greater environmental benefits, 59% to 41%.

While in principle solutions that incorporated more environmentally sustainable techniques were welcomed, this does not mean that customers are willing to write a blank cheque. The pervading lack of trust in companies we have highlighted in previous research means that, in focus group discussions, many expressed doubt about whether these solutions would really bring the promised benefits. Any company proposing bill increases specifically to support nature-based solutions will need to communicate how these will be achieved, as well as, ideally, what progress has been delivered over time.

But overall where the potential benefits to consumers and the environment of nature-based solutions could be clearly shown – and they appreciate that these will not always be appropriate for every scenario – there was strong support for them, even if it meant waiting longer, or paying more. We hope that these findings encourage companies to consider this as they explore future investment options.

Background and objectives

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CCW wanted to understand preferences for different approaches for improving river water quality and waste water treatment. There have been developments in the options available for water infrastructure, with potentially less reliance on man-made infrastructure and more use of nature-based solutions (NBS). Quantitative and qualitative research was needed to explore the interplay of different attributes in creating the optimum solution for the consumers.

The quantitative element of this research looks at consumer views of man-made, mixed and NBS solutions specifically for storm overflow and waste water treatment issues.

The objectives were as follows:

1. Uncover consumers’ opinions of different approaches to sewerage and water infrastructure
2. Understand their preferences and the reasons behind them
3. Identify the relative importance of different aspects of solutions (e.g. price, timescales)

Executive summary

Key learnings: Summary

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There is consumer appetite for solutions that are **as natural as possible**, be that entirely nature-based or mixed if necessary.

Consumers are willing to accept a rise in annual household water bill to cover the cost of solutions that are as natural as possible – up to £40 for a nature-based solution.

There is relatively low preference and support for entirely man-made solutions.

Key learnings (1)

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- When consumers consider what is most and least important to them for a water solution, the impact on their **household water bill** is most important of the attributes measured. When impact on water bill is removed from the equation, the most important attributes become **how long the solution will last**, **how long it takes** to implement and its **environmental impact**.

- Consumer attitudes on the importance of these attributes **did not vary notably between the two scenarios** (drainage/ overflows and waste water treatment), and this was true for all the survey results presented in this report. There were very few notable differences in attitudes between England and Wales.

- There is clear preference for solutions that have **no or low financial impact** on household water bills. There is also a preference for solutions that **last a long time** (20+ years) and take **no more than 2 years** to implement. Additionally, there is a preference for solutions that provide significant **environmental benefits**, cause **minimal local disruption** and have a **positive effect on CO2 levels**. There is slight preference for solutions with **additional benefits**, ones that use **low levels of man-made materials** and solutions that are **used frequently and have predictable outcomes**.

- When modelling solution options for both drainage/ overflows and waste water treatment, it is the **nature-based solution that is the most supported** (36% and 37% respectively). The next most supported option is a mixed solution (23% and 22% respectively), with a man-made solution only gaining minority support (5% for both). Given the option, just over a third (35% and 36% respectively) would not support any of the modelled solutions. Full details of the solution options tested are to be found on page 30.

Key learnings (2)

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- In the solution options modelled, NBS had a higher impact on the annual household water bill (£40) than the man-made and mixed solution options (£20 each). When testing support for nature-based solutions at different price points, the consumer shows **greater consumer support for the nature-based solution over the mixed and man-made ones up to the price point of £60** – even whilst the man-made and mixed options retained the £20 price point. Beyond £60, consumer preference switches to the mixed solution. There is evidence that higher income households (£41k+) are more willing to accept a higher price rise.

- At **no point did consumer support switch to man-made** when tested up to the maximum bill price rise of £80.

- Qualitatively, consumers expressed a **preference for natural solutions** rather than man made ones, especially in the context of climate change. They also felt the additional benefits of NBS were appealing, and whilst there was hesitation around it being a less tested option, ultimately it was felt that **measured risks** have to be taken to make improvements.

- Overall, focus groups found that **nature-based solutions are appealing to consumers due to the very fact that they are not as reliant on man-made materials.** This generated far more discussion than the actual drawbacks on the man-made solutions

Key learnings (3)

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- However, consumers expressed that **NBS was unlikely to be a perfect solution** – there could be issues such as whether it truly had environmental benefits or difficult maintenance. Nevertheless, downsides were also found for man-made (e.g. capacity limits; damage to the environment). This led to the conclusion that in some scenarios, a **mixed option would be best suited**.

- When **price sensitivity of the mixed option** was modelled, consumers **support for the mixed, nature-based and not having strong support for any of the options is very similar**. There is slight preference for the mixed option until about £5, after which point support switches to the nature-based option (even at a cost of £20), or choosing not to support any of the options.

- When the price sensitivity of the **man-made option was modelled, consumers never showed majority support for it**, even when the man-made option was priced at £0 vs. the nature-based option at £40 and mixed option at £20.

- Whilst it was not a specific objective of this research, within the qualitative focus groups concerns around **trust in the water companies and regulators** spontaneously arose amongst participants. This had a bearing on their confidence of providers to deliver the solutions being discussed, and is something that companies need to take into account.

Methodology

Quantitative Sample & Methodology

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Overview

Online survey of 2,320 adults (aged 18+) in England and Wales

Fieldwork conducted 29th September – 11th October 2023

The full sample has been weighted to be representative of England and Wales combined based upon the 2011 census profile. The boost sample has been weighted down to be representative of Wales

Approach

CCW commissioned Yonder Consulting to undertake an online omnibus survey in England and Wales.

Yonder own and manage a highly engaged online panel of 150,000 UK adults and this resource was used as the primary source of sample for the online survey.

Yonder conducted 2,320 online interviews with consumers in England and Wales. 331 boost interviews were conducted among consumers in Wales to allow for robust analysis and weighted back into the overall sample at the correct proportion.

Further information on the quantitative methodology is in the appendix.

Sampling

A stratified sampling technique was employed using multiple demographic groupings to select respondents randomly from Yonder Consulting's online panel. This approach helps to minimise selection bias and ensure certain segments of the population are not over- or under-represented.

Quotas were set on age, gender, region and social grade. The data was then weighted based upon the 2011 census profile of England and Wales combined. Rim weighting was applied for age, gender, government office region, and social grade. Tenure was weighted based upon the England and Wales profile as individual nations. The boost sample was weighted down to match the 2011 census profile of Wales. The 2011 census is the latest available full census.

Conjoint Overview

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The online survey in this research used a technique called a conjoint. A conjoint is a choice-based exercise which asks respondents to pick the option that most appeals to them from a short list of options. It is a realistic method which replicates the choices that consumers could have in a solution and includes the features (attributes) of the solution such as length of time taken to complete and price.

This method allows full understanding of the relative importance of these attributes as well as the relative importance of each level within each attribute (i.e. high vs low level of disruption, and positive vs negative impact of carbon levels etc.).

In addition to the analysis contained in this report, a simulator has been produced which allows CCW to test different solutions whilst changing the attributes and estimate the impact on share of preference.

The conjoint sample was split into two: one half was given context about drainage and overflows, the other about waste water treatment. Samples for each group were matched. Throughout the report, they are referred to as Drainage/Overflows and Waste water treatment.

Nine solution attributes were tested within the conjoint. Within each of the attributes, there were 2-5 levels. Both the attributes and their associated levels are displayed on the following slide.

The following slides consider the overall relative importance of each of these attributes when a consumer is presented with a water solution. All alternatives were tested against each other – i.e. a single option had all nine attributes, but the levels were picked according to a balanced statistical design.

To model share of support, the respondents were asked how likely they would be to support the solution in question. This has allowed analysis not only of share of preference but also share of support. Please see slide 13 for additional information on this.

Solution attributes tested

Attributes

Levels	How long the solution will take to complete	How long the solution will last	Change on average water bill per year	Level of local disruption	Longer-term impact on carbon (CO2) levels (effect on global warming)	Usage of man-made materials	Improves environment	Performance of solution	Single vs multiple benefits
	Less than 1 year	5-10 years	None	Minimal (mostly takes place away from local residential areas	Positive (some carbon is created and released during the build, the solution then releases little and/or absorbs carbon over time)	Low (uses machinery during build, but end result is mostly natural)	Solution does not improve or negatively affects environment	A frequently used solution, with more predictable cost/outcomes	A solution that tackles this one specific issue
	1-2 years	10-20 years	(+) £20	Some (e.g. local roads dug up temporarily, heavy vehicles	Negative (some carbon is created and released during the build, and the operation of the solution releases carbon over time)	Medium (uses machinery during build and a mix of man-made materials and landscaping is left in place)	Solution has some environmental benefit	A newer, less 'tried and tested' solution so harder to predict cost/outcomes	A solution that tackles this specific issues, and also has other benefits
	2-5 years	20+ years	(+) £40			High (uses machinery to build, and mostly man-made materials left in place	Solution has a significant environmental benefit		
	5+ years		(+) £60						
			(+) £80						

The same conjoint and attributes were used for both the drainage/overflows and waste water treatment scenarios

A guide to share of preference versus share of support

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Share of Preference
The majority of results in this report are based on 'share of preference'. Share of preference simply reflects what people would choose if they had to pick one of the simulated options, e.g. the man-made vs. nature-based solution vs. the mixed solution. It is based directly upon the choices respondents make during the main conjoint exercise.

Share of Support
This takes into account not only the choices respondents made during the main conjoint exercise, but also how likely they are to support this type of solution. Share of support only includes those who said they were 'Very' or 'Quite' likely to support that solution. This means that when consumers are displayed using share of support, there will always be a proportion who would not choose any of the solutions ('None supported' or 'No [drainage/overflow OR waste water treatment] options supported').

Main Conjoint Question

Thinking generally, which of the different options below for managing storm overflow/removing pollution from rivers and streams is most appealing to you?

Question to Measure Share of Support

How likely or unlikely would you be to support an overall solution that reflects the choice you just made?

a) Very likely
b) Quite likely
c) Neither likely nor unlikely
d) Quite unlikely
e) Very unlikely

Qualitative sample and methodology

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3 x 90 minute focus groups with water consumers from England and Wales. All participants were engaged to some extent with water issues and were sole/ joint bill payers, but each group contained consumers at different life stages: pre-family, family and empty nester/ retired.

Participants were provided with a pre-task which contained background reading and questions to think about prior to the focus groups.

Stimulus was also shared within the groups, as outlined in the appendix.

Fieldwork conducted 9th – 17th of November 2023

Findings

What's important to consumers when planning water infrastructure?

Impact on average water bill per year is the most important attribute for both drainage/overflows and waste water treatment solutions

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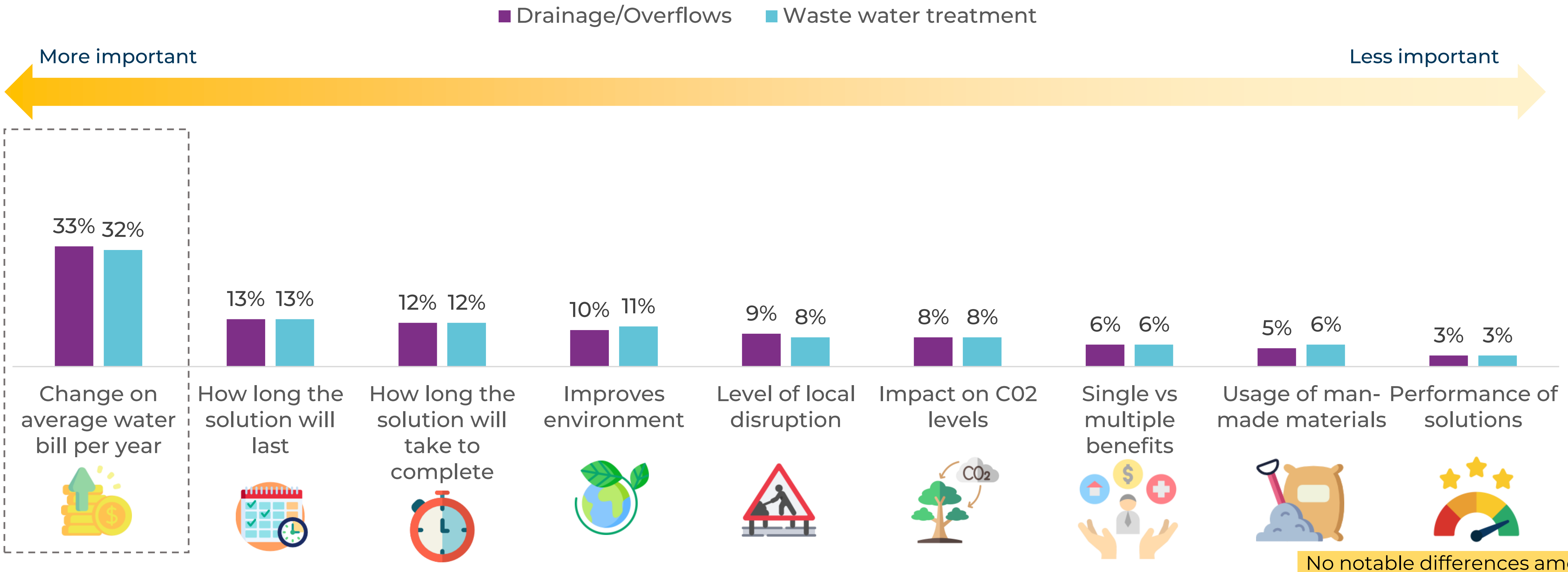
Relative importance of attributes when choosing a preferred solution



No notable differences among demographics

Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)

When excluding changes to the water bill, consumers prioritise the durability of the solution, how long it takes to complete and improvement to environment

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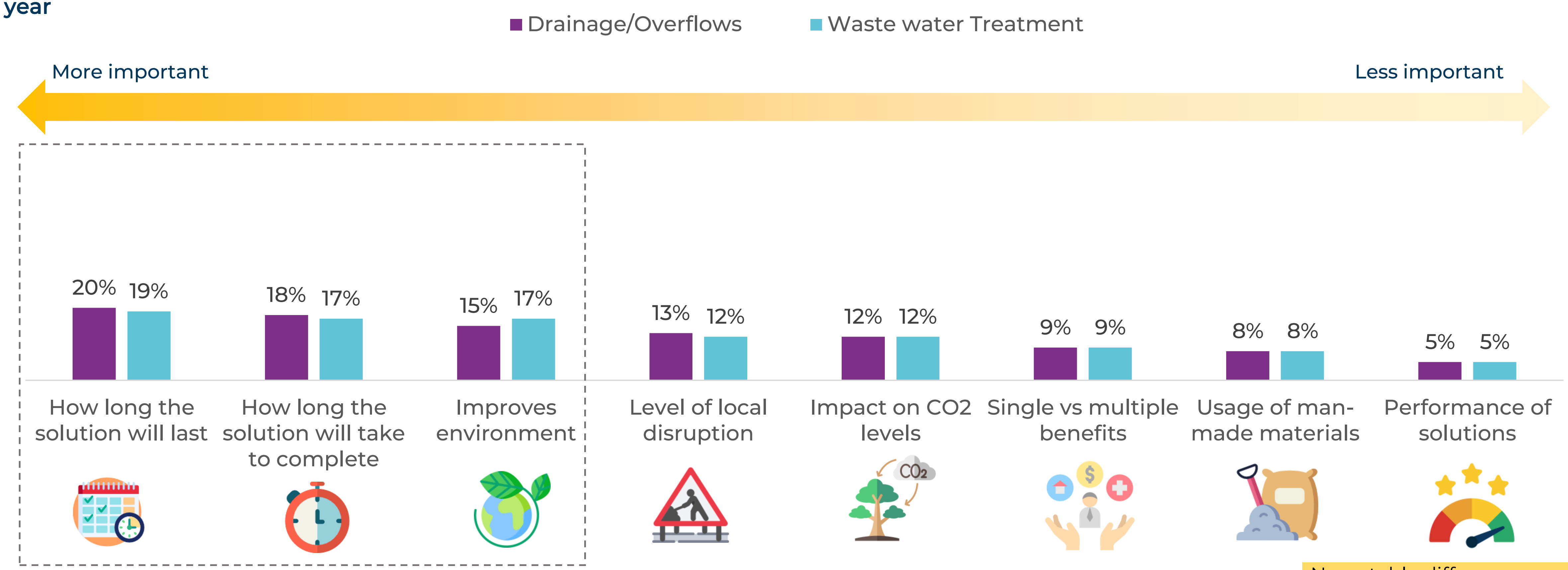
Relative importance of attributes when choosing a preferred solution, excluding change on average water bill per year



No notable differences among demographics

Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)

Contextualisation: negativity about water company performance and Ofwat's regulation persists

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- Water companies are persistently viewed as prioritising shareholders over customers
- This perception is exacerbated by media coverage reporting potential administration, take overs and environmental damage
- Participants were also able to recall personal instances when they had witnessed long-standing leaks or pollution when wild swimming etc.
- Awareness and knowledge of Ofwat is mixed
- Whilst there is a baseline assumption that there is 'a regulator' as with other utilities, specific knowledge is mostly limited
- Those who are more engaged are very sceptical on the role of Ofwat and perceive it to be 'toothless and ineffective'

"I don't really see why we should have to pay … it's not our fault if they have these been mismanaged. They should look back at the reserves, and the bonuses that have been paid for poor performance."

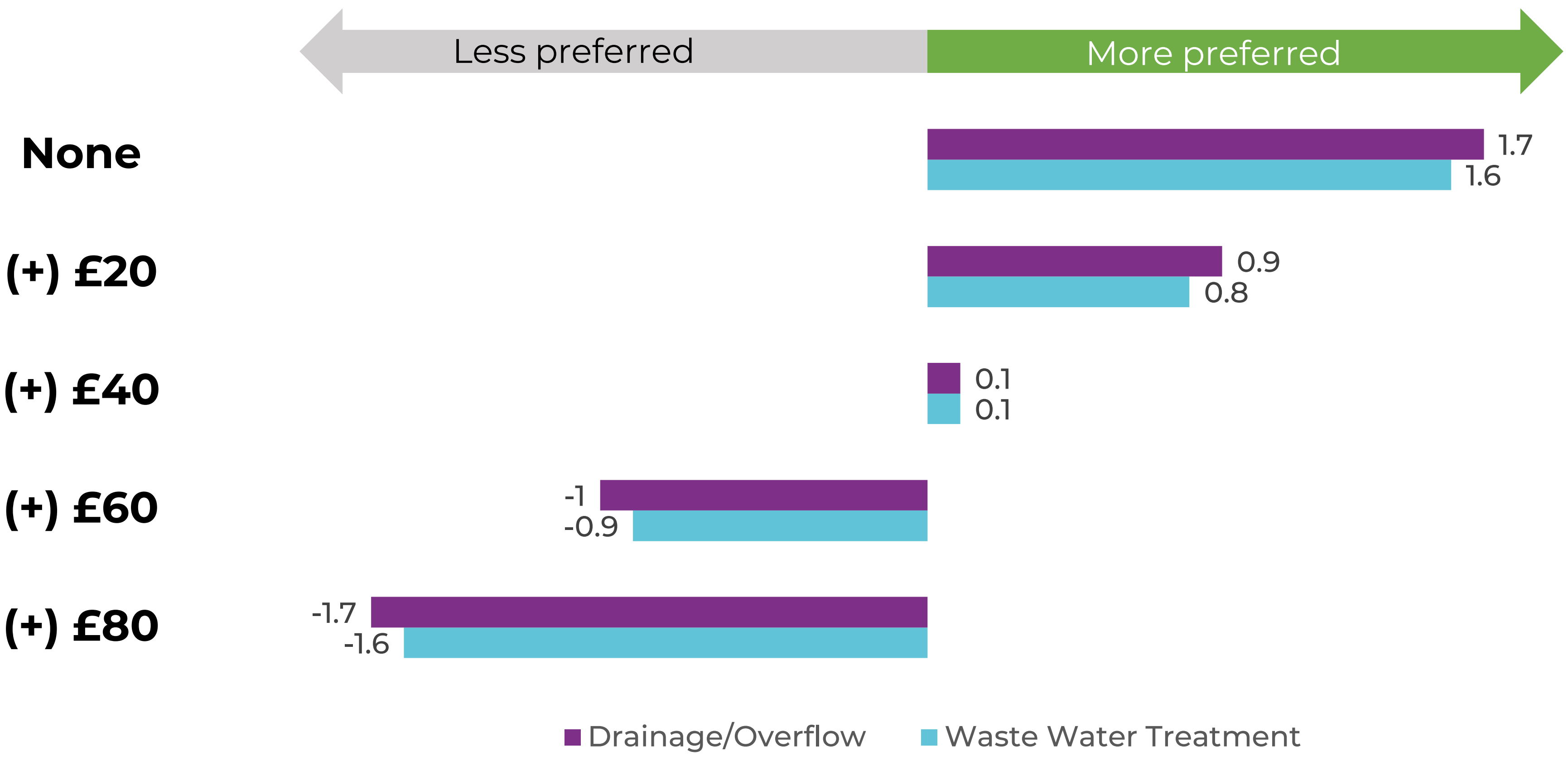
"A lot of companies just get away with it because they know they can."

"We don't regulate the industry at all."

This lack of trust is impactful upon perceptions of any solutions. This came out strongly in discussion of general water issues even before the scenarios were presented.

Price preference for each solution is directly proportional to the price increase. The lower the price rise, the higher the preference

Utility score for change on average water bill per year



Those over the age of 35 were more price sensitive for both scenarios. 18-34s have a score of 1.4 & 1.5 for no price rise, whereas those over 35 had a score of 2 & 1.8 and 1.8 & 1.6 for no price rise.

Men tended to be more price sensitive for both scenarios. Men have a score of 1.9 & 1.9 for no price rise, whereas women had a score of 1.7 & 1.5 for no price rise.

Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
Drainage/Overflows: 18-34 (339); 35-54 (406); 55+ (415); Men (552); Women (602)
Waste Water Treatment: 18-34 (334); 35-54 (411); 55+ (416); Men (573); Women (583)

There was clear preference for a solution which will have good durability (20+ years) for both scenarios

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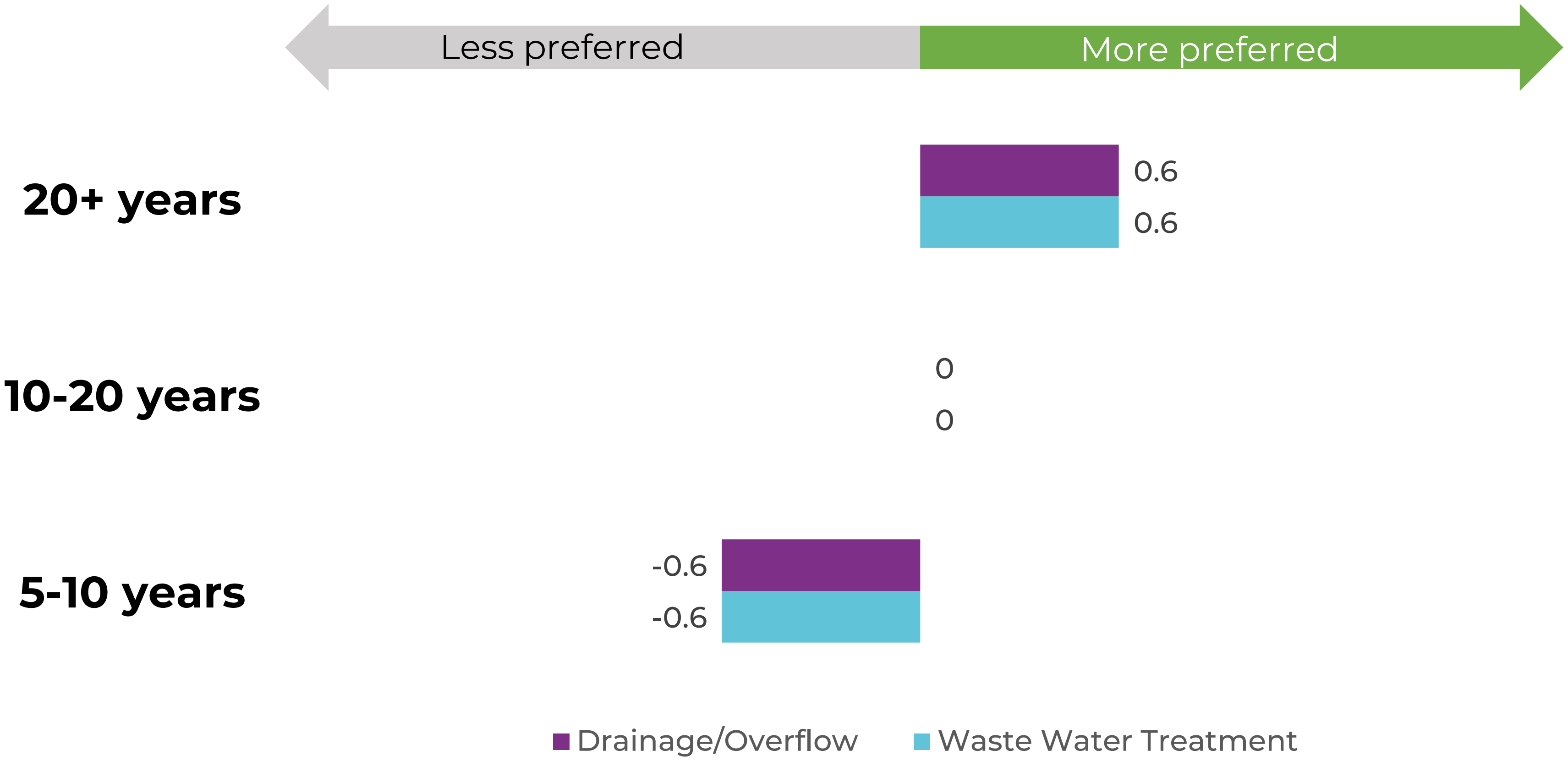
Utility score for how long the solution will last



Those over 55 years old were more likely to prefer a long term solution for both scenarios. 55+ have a score of 0.6 & 0.7 for 20+ years, whereas those under 34 had a score of 0.5 for a solution that lasts over 20 years

Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
Drainage/Overflows: 18-34 (339); 55+ (415)
Waste Water Treatment: 18-34 (334); 55+ (416)

The preference for solutions that take up to 2 years to complete was the highest. Options taking over 5 years were less preferred

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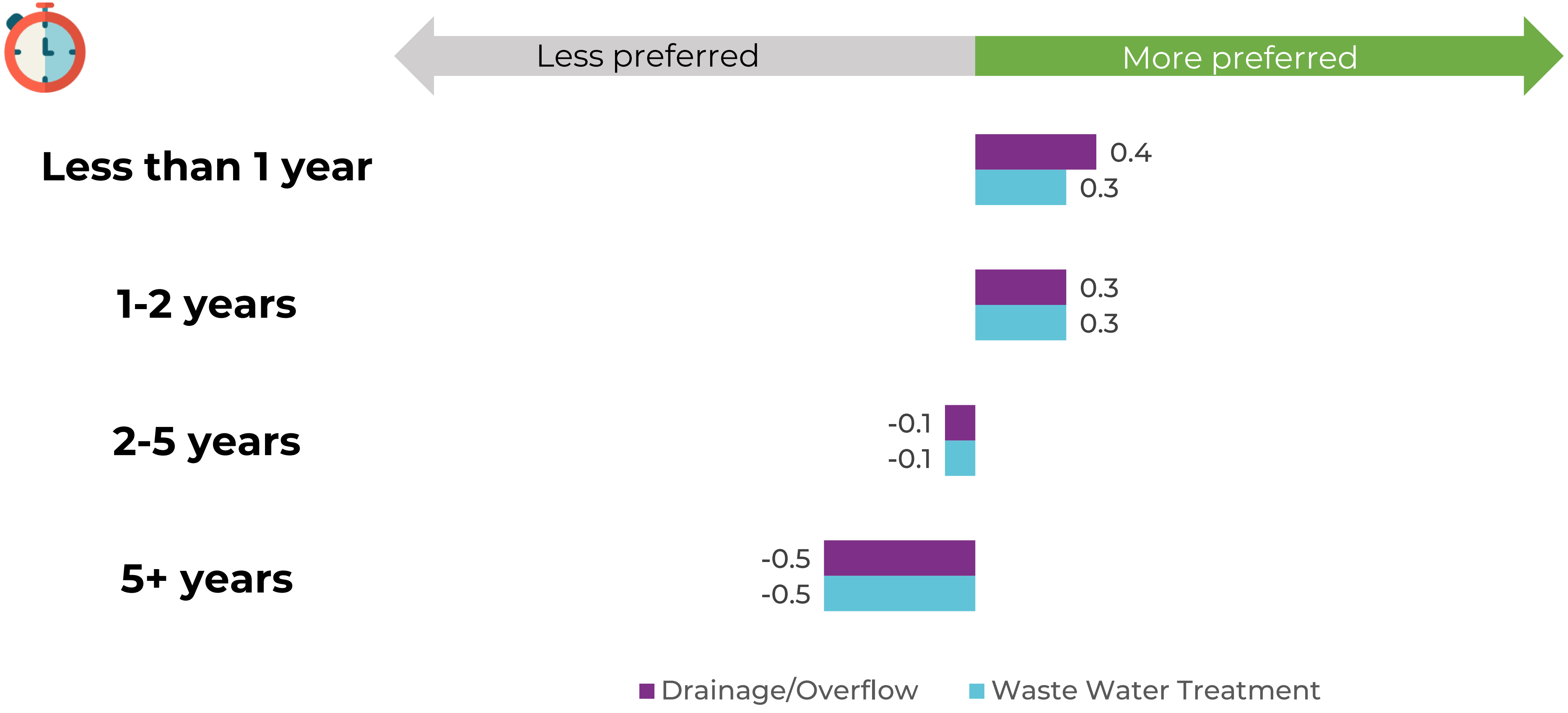
Utility score for how long the solution will take to complete



Those over 55 years old were less likely to prefer a solution that takes over 5 years to complete for both scenarios. 55+ have a score of -0.6, whereas those under 34 had a score of -0.4 & -0.5

18-34 year olds slightly preferred a solution that takes **1-2 years** (0.3) than one that takes **less than a year to compete** (0.2) for **Water Treatment** Solutions

Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
Drainage/Overflows: 18-34 (339); 55+ (415)
Waste Water Treatment: 18-34 (334); 55+ (416)

Solutions which have a significant or some benefit to the environment were preferred

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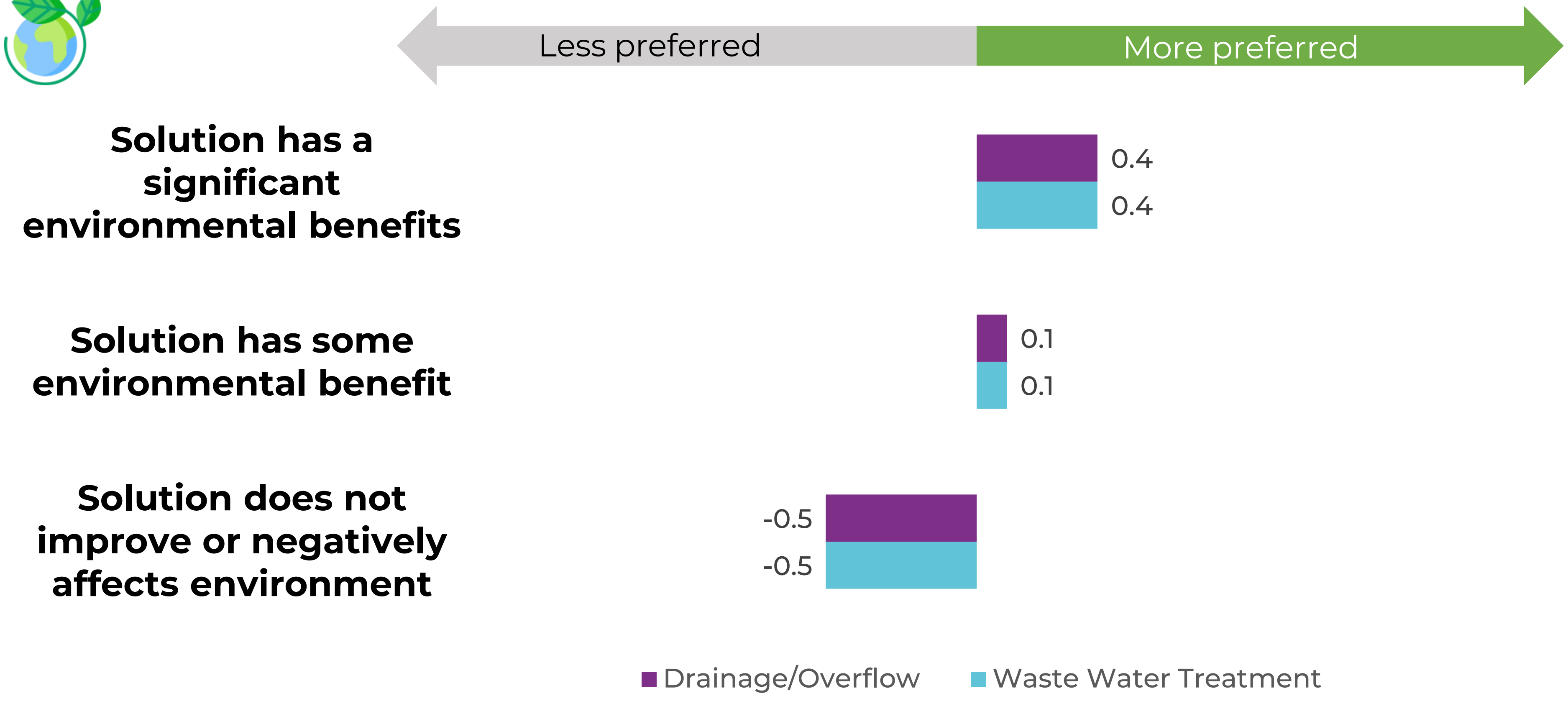
Utility score for improves environment



Those over the age of 55 were more likely to prefer a solution which had significant benefits to the environment than those under 34, for both scenarios. 18-34s have a score of 0.3 for significant benefits, whereas those over 55 had a score of 0.5

Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
Drainage/Overflows: 18-34 (339); 55+ (415)
Waste Water Treatment: 18-34 (334); 55+ (416)

Solutions that have minimal to some disruption were preferred to solutions which have a high level of local disruption

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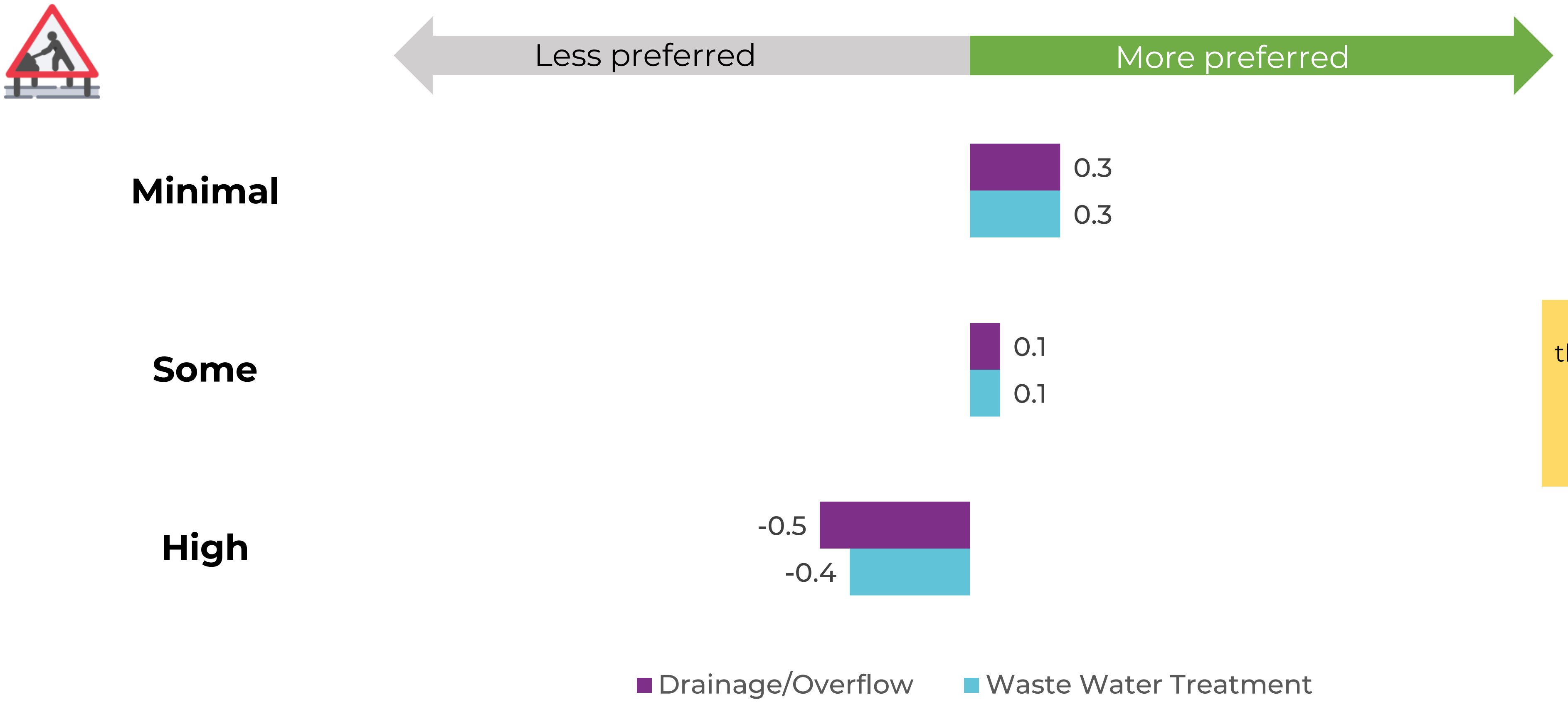
Utility score for level of local disruption



Women, those **over 35** and those who live in **Wales slightly preferred** a solution that causes **minimal local disruption** for **Drainage/Overflow** Solutions

Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
Drainage/Overflows: Women (602); 35-54 (406); 55+ (415); Those living in Wales (64)

Solutions which have a positive impact on CO2 levels were preferred

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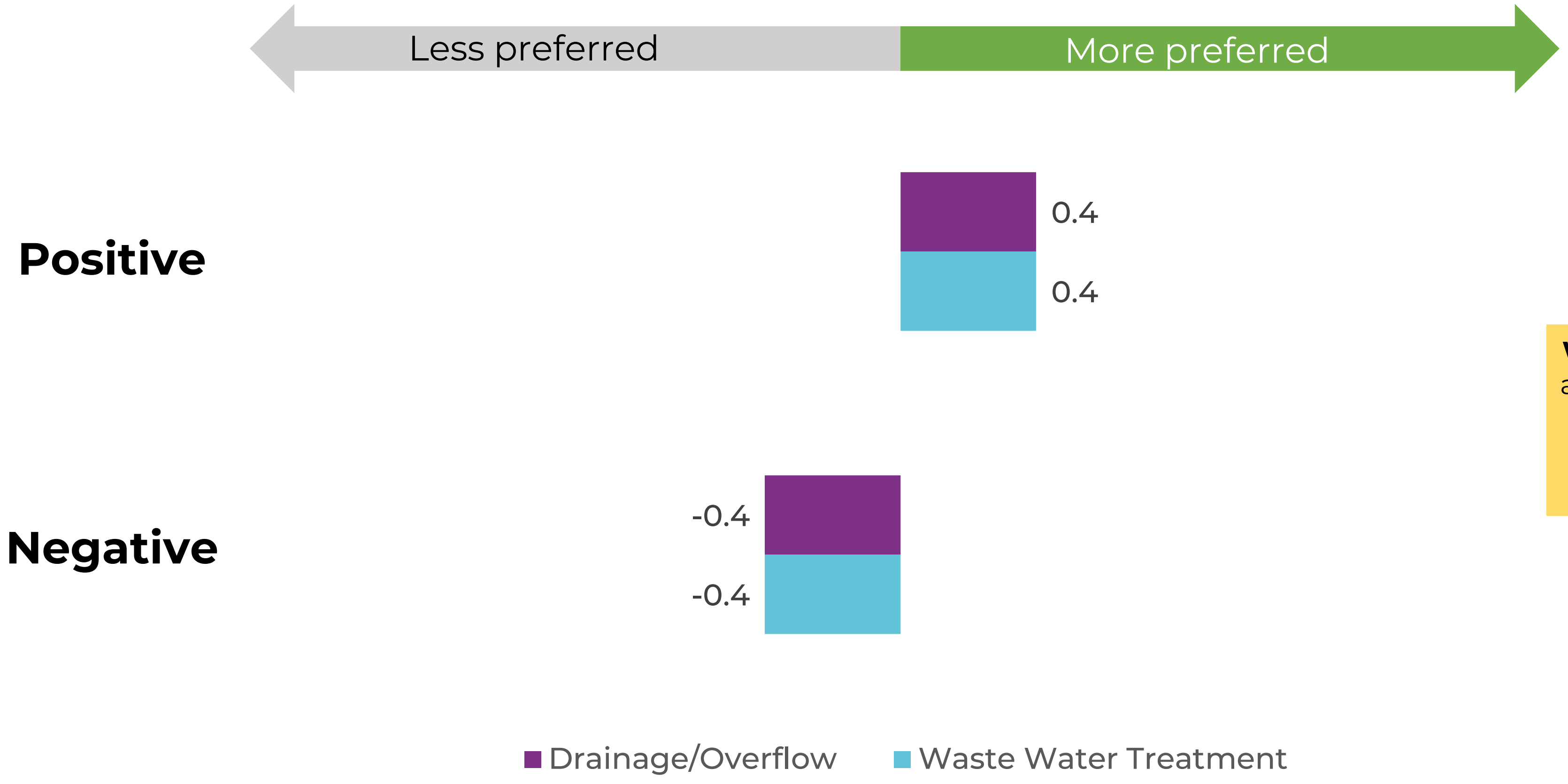
Utility score for impact on CO2 levels



Women (0.4) found if there was a **positive** impact on **CO2 levels** slightly more **important** to determine **preference** than **Men** (0.3) for both scenarios

Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
Drainage/Overflows: Men (552); Women (602)
Waste Water Treatment: Men (573); Women (583)

Solutions that have multiple benefits were preferred to a solution that only one problem

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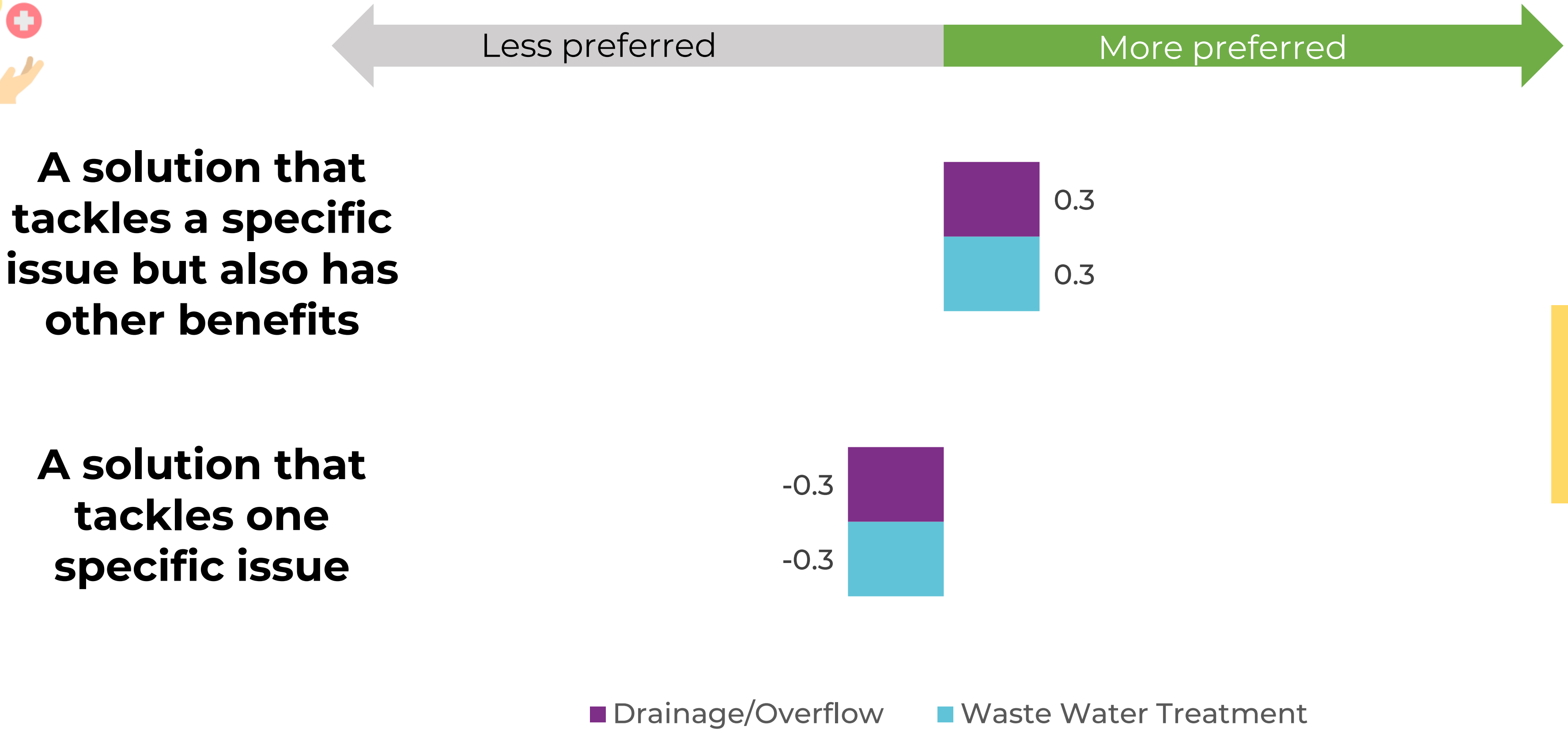
Utility score for single vs multiple benefits



Those over 35 (0.3) found if there was a **multiple benefits** to the solution slightly more **important** to determine **preference** than 18-34 (0.2) for both scenarios

Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
Drainage/Overflows: 18-34 (339); 35-54 (406); 55+ (415)
Waste Water Treatment: 18-34 (334); 35-54 (411); 55+ (416)

Solutions that have a low usage of man-made materials were preferred to solutions which use a high level of man-made materials

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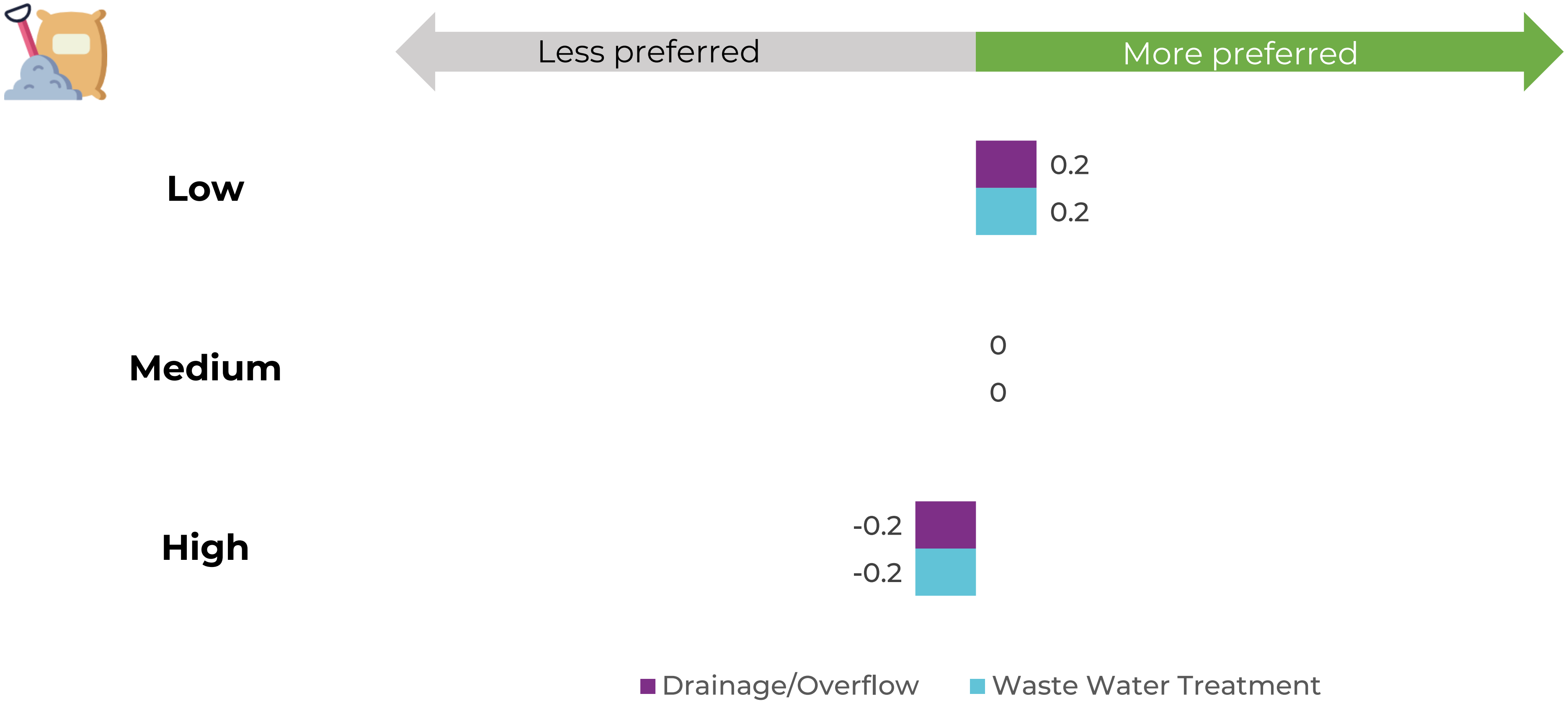
Utility score for usage of man-made materials



No notable differences among demographics

Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)

For both scenarios, a frequently used solution which was more predictable was preferred to newer methods

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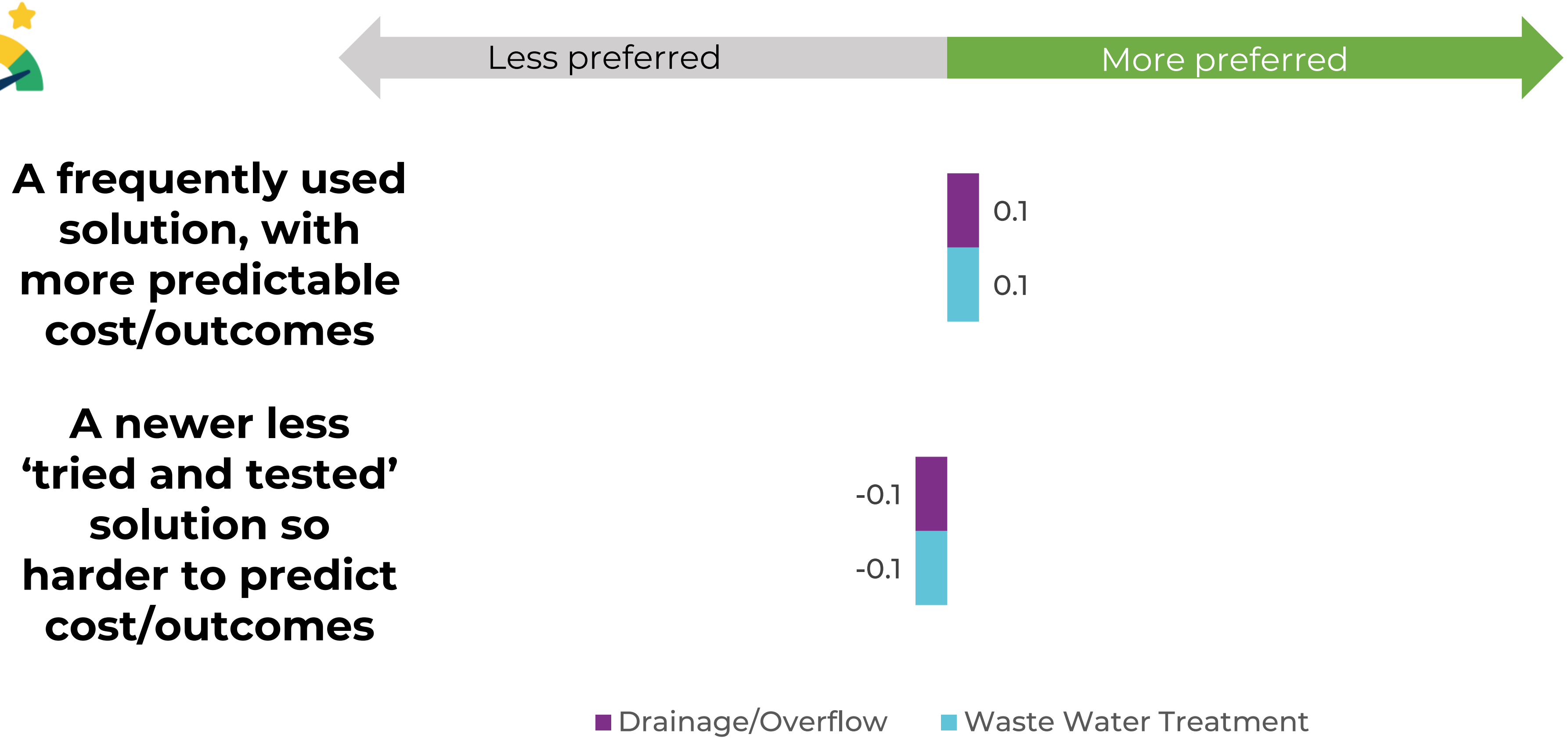
Utility score for performance of solution



No notable differences among demographics

Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)

Which solutions do consumers prefer?

Overview of base case scenarios

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Three base case scenarios were selected by CCW to test as examples of a man-made and a nature-based solution (NBS), as well as a mixed solution, in order to assess consumer support for potential options.

Man-Made Solution

This solution was modelled:

- To take less than 1 year to complete
- To last 5-10 years
- To change the average water bill by an additional £20
- To have a high level of local disruption
- To have a negative impact on CO_2 levels
- To have high usage of man-made materials
- To have no effect or a negative effect on the environment
- To be a frequently used solution, with more predictable cost/outcomes
- To tackle one specific issue

Mixed Solution

This solution was modelled:

- To take 1-2 years to complete
- To last 10-20 years
- To change the average water bill by an additional £20
- To have some local disruption
- To have a negative impact on CO_2 levels
- To have medium usage of man-made materials
- To have some environmental benefits
- To be a newer, less 'tried and tested' solution, so harder to predict the cost/outcomes
- To tackle a specific issue but also have other benefits

Nature-Based Solution

This solution was modelled:

- To take 2-5 years to complete
- To last 10-20 years
- To change the average water bill by an additional £40
- To have a minimal level of local disruption
- To have a positive impact on CO_2 levels
- To have low usage of man-made materials
- To have a significant environmental benefit
- To be a newer, less 'tried and tested' solution, so harder to predict the cost/outcomes
- To tackle a specific issue but also have other benefits

NBS are the most preferred and supported option for drainage/ overflow scenarios

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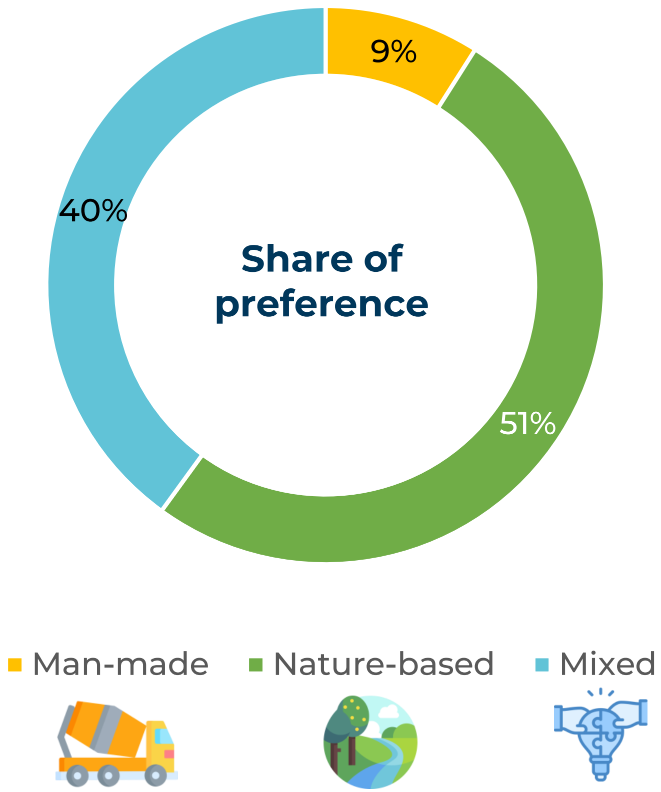
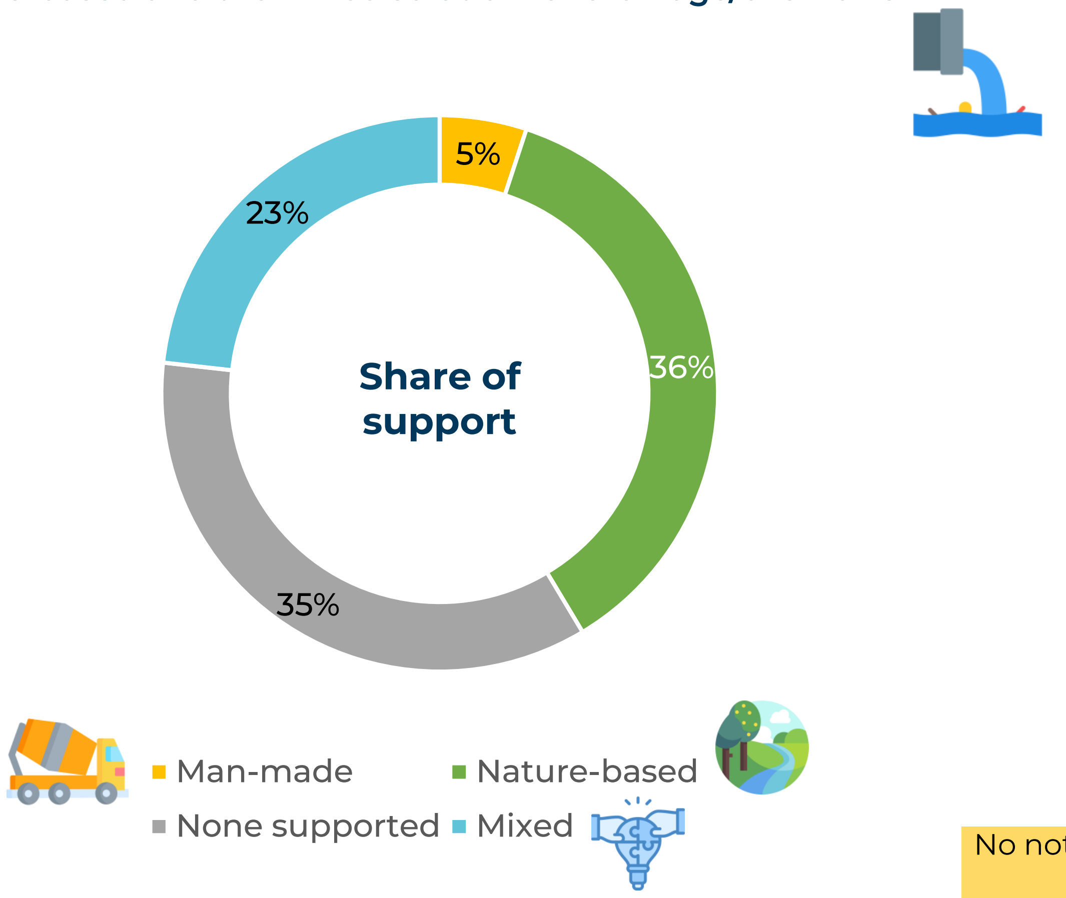
Preferences and support between the man-made, the nature-based and the mixed solution for drainage/overflows

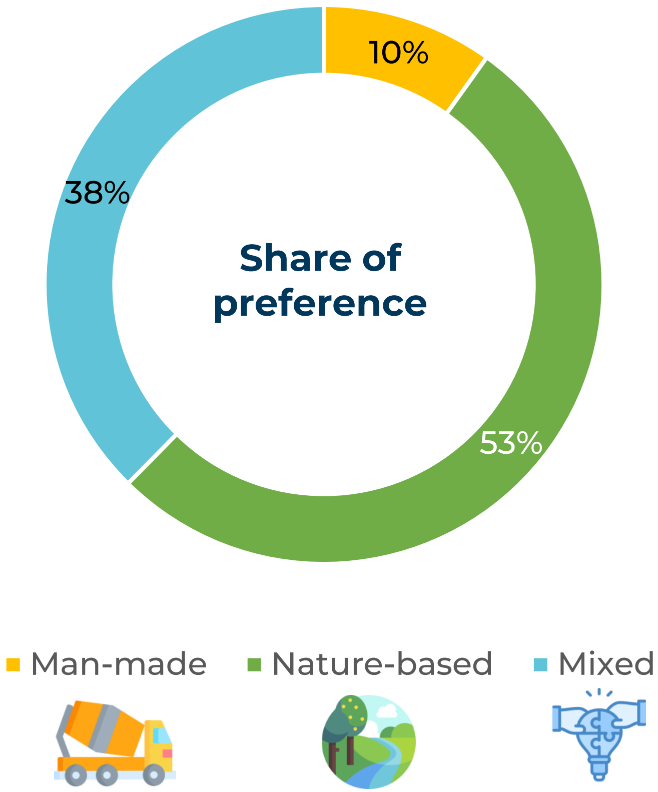


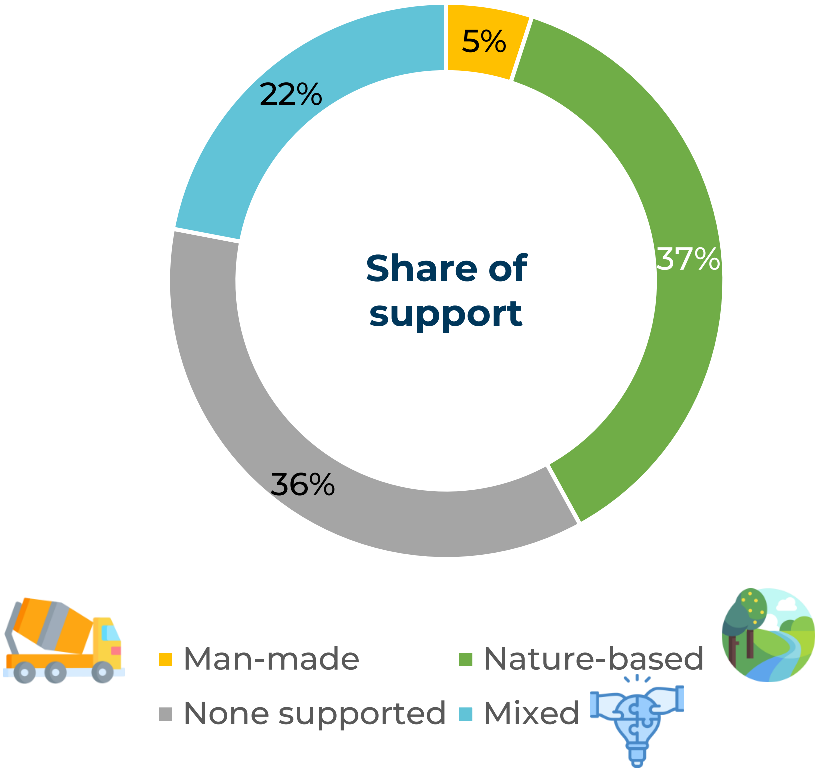


No notable differences among demographics

NBS are also more preferred and supported option for waste water treatment scenarios

Preferences and support between the man-made, the nature-based and the mixed solution for waste water treatment





No notable differences among demographics

Overall, there is strong support for nature-based solutions

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- NBS are appealing to consumers due to the very fact that they are not as reliant on man-made materials. This generated far more discussion than the actual drawbacks on the man-made solutions
- Man-made conjures imagery of ‘concrete’, carbon emissions and nature being diminished.
- NBS, by contrast, generates more pleasant imagery of green, sustainable interventions which are beneficial to the environment
- As climate change becomes an increasingly prescient issue, even for those whose engagement is limited, any alternative to purely man-made solutions are well received

“You've got the environmental issues for the start. You know. Just add something to the environment. It's not just about water. it's about clean air, you know. It's about [being] aesthetically pleasing. It's about carbon footprint.”

“This is natural. It should be like this … That's an ideal scenario.”

“In an ideal world? I'd want option 2 [NBS] every day, like, I think it looks so much nicer. I think it's more proactive. And kills 2 birds with one stone”

NBS have benefits which go beyond 'just not being man-made'

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Consumers are concerned about climate change and the impact of pollution upon rivers and seas. Addressing these problems in a way which is not simultaneously adding to the problem (i.e. by adding more chemicals or releasing more carbon) is very appealing.

NBS are also thought to be more aesthetically appealing and likely to have secondary impacts – particularly upon urban areas which may benefit from more green space etc

NBS enable consumers to engage more in what this kind of solution could lead to e.g. community engagement, resurgence of wildlife

There is appetite to embrace NBS despite the greater risk of new technology

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- There is pragmatism that in order to innovate and address climate change, risk is needed
- Man-made solutions were once seen as 'risky' and are now considered the safer option
- There is a greater sense that responding to the climate crisis requires bold and innovative thinking and that it's too late not to take risks
- Without risks, nothing will change or get any better
- However, customers will not give a green card to any NBS despite this appetite for risk. There needs to be clear communications on how the risk is justified and why it's worth taking

"I think they tried the industrial mechanical solutions, and they're gonna have to move towards the natural solutions."

"I think sometimes that you do have to take a risk and invest in that new technology, because, you know, at some point we probably would have sat here and been like, Oh, option one [man-made] is an expensive giant hole in the ground. It's not gonna work, but now they've actually invested it and tried it."

However, there is scepticism over ongoing maintenance of NBS initiatives

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How much impact will the NBS actually have?	• Consumers don't know the comparative cost of man-made (and population size that benefits) and NBS so find it hard to determine • Is it worth justifying the cost?
Is this just greenwashing?	• Are NBS are a way for companies to claim they are addressing climate change without actually having much impact? • Given they are smaller in size, it feels less disruptive for companies to do without significant investment
How serious will companies be in ensuring ongoing maintenance?	• Without thousands of households depending on the intervention, will water companies deprioritise this? • What happens if other utilities/ providers want to build/ dig up around the area? • What's the contingency if there is a drought/ flood?

Consumers recognise that NBS have limitations, but see man-made as having limitations too

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Llais defnyddwyr dŵr

- Limitations are cited in relation to capacity.
- It is recognised that, for example, a big tank will be more effective in collecting significant amounts of rainwater than slowly absorbing greenery will.
- However, a key benefit of NBS is that they are not just helping to address an existing problem, but that they are **preventing** said problem from getting worse or indeed causing new problems.
- Man-made solutions are seen to not be addressing the core issues but instead are managing them, rather than attempting to prevent them in the first place.
- Adding man-made on top of man-made (e.g. chemicals to treat water) is seen as exacerbating the problem rather than attempting to prevent the problem or helping the environment.

The preventative aspect of nature-based solutions is a key point of appeal to consumers.
Man-made feels reactive with no element wider benefits other than to address a specific issue.

As consumers recognised that both man-made and NBS have drawbacks, they conclude mixed solutions could be suitable for specific issues

The voice for water consumers
Llais defnyddwyr dŵr

- Consumers are pragmatic and realistic that NBS are not able to provide the level of intervention that is needed in all instances (e.g. flooding)
- However, it is felt that NBS are unlikely to ever be solely sufficient for large urban areas – but anything which can address the dependence upon man-made is well received
- A future which doesn't solely rely upon man-made is, therefore, preferred

"Surely it would be different solutions for different areas depending on the local geography, local demographics. So it's gonna be a whole range of solutions that need to be. But and obviously over time you'll then (see) the results will show that actually, this one is better than that one for the following reasons."

How much are consumers willing to pay for solutions?

Understanding Pricing Sensitivity Models

The voice for water consumers
Llais defnyddwyr dŵr

The following slides display the pricing sensitivity modelling.

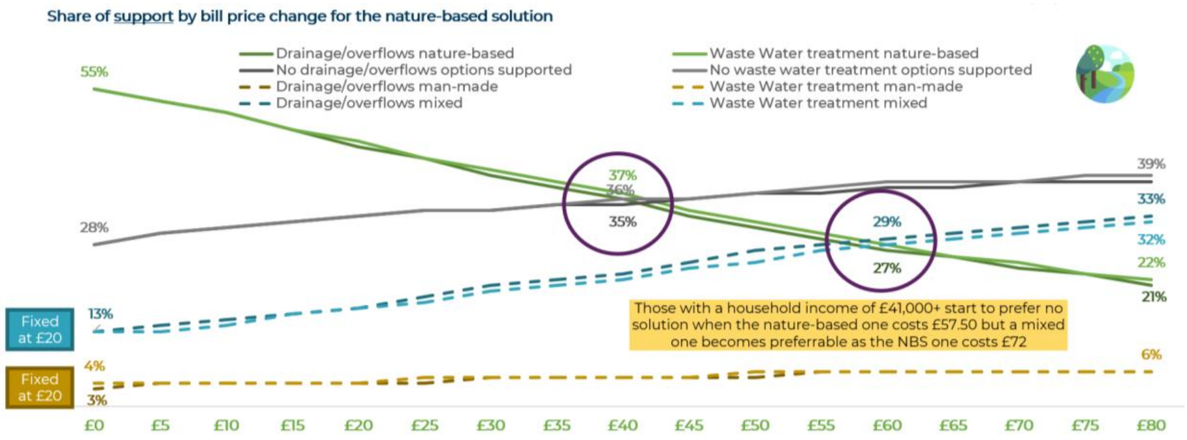
These are outputs from the Conjoint analysis which show a bill price rise of £0-£80 for one solution. The graph models either the change in share of preference or share of support for the other two solutions as this bill price rise happens.

Results are displayed for a bill price rise for each of NBS (slides 41-42), mixed (slides 43-44) and man-made (slides 45-46). Each solution has a model for share of preference and share of support.

As an example, on the right we have the support model for NBS solutions. It shows us there is clear consumer support for NBS when it is priced at £0, although support diminishes as the price rises, to the tipping point of a £40 cost for NBS, where support for taking no action becomes higher. Throughout this model the price for mixed and man-made solutions remain steady at £20 each.

Yellow lines are used for man-made solutions for both scenarios, blue is used for mixed solutions, and green is used for nature-based solutions. Grey lines denote the 'No [Drainage/overflows or Waste Water Treatment] option supported' (see slide 13 for an explanation of no support).

Any demographic differences are highlighted in the yellow box.



NBS are preferred even when that involves a bill price rise - until around the point that the annual household bill rises by £50 when mixed becomes preferred

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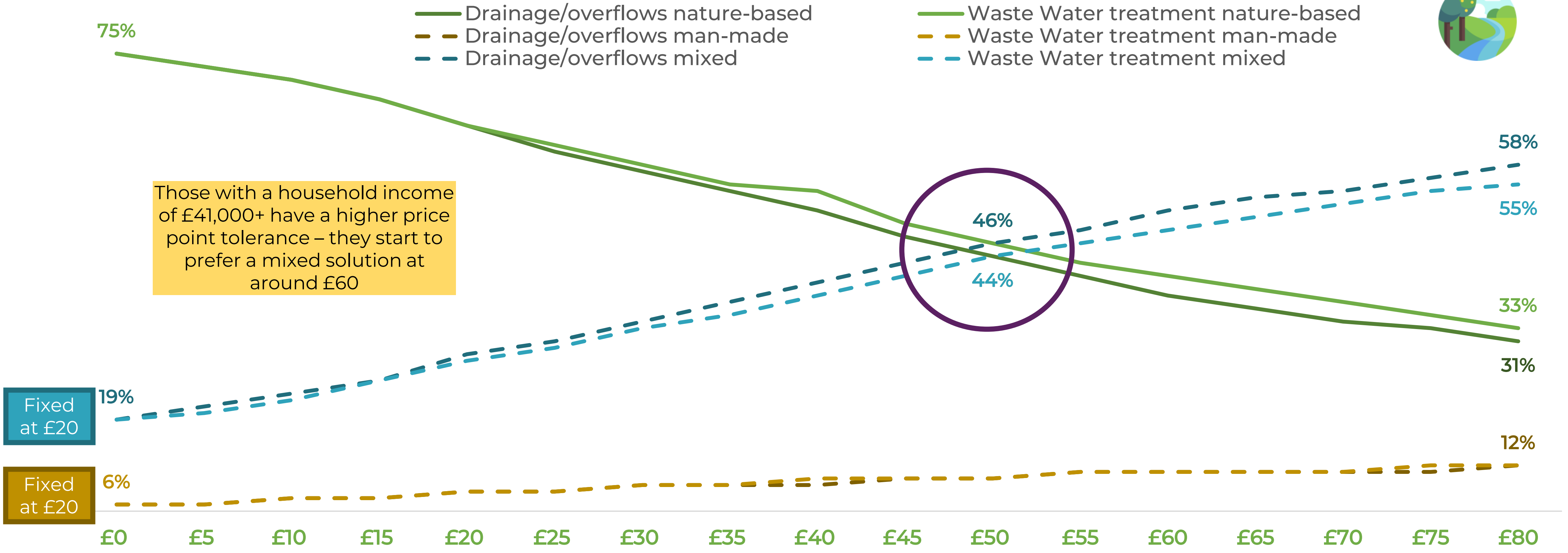
Llais defnyddwyr dŵr

Share of preference by bill price change for the nature-based solution



Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
The dashed lines represent the solutions that remain stable at £20 for this model. This model demonstrates which price point is likely to result in a decrease of consumer support

Over half support NBS for both scenarios, with mixed solution being slightly more preferred once nature-based gets to £60. However, share of support switches increasingly from NBS to no options being supported beyond the £40 point

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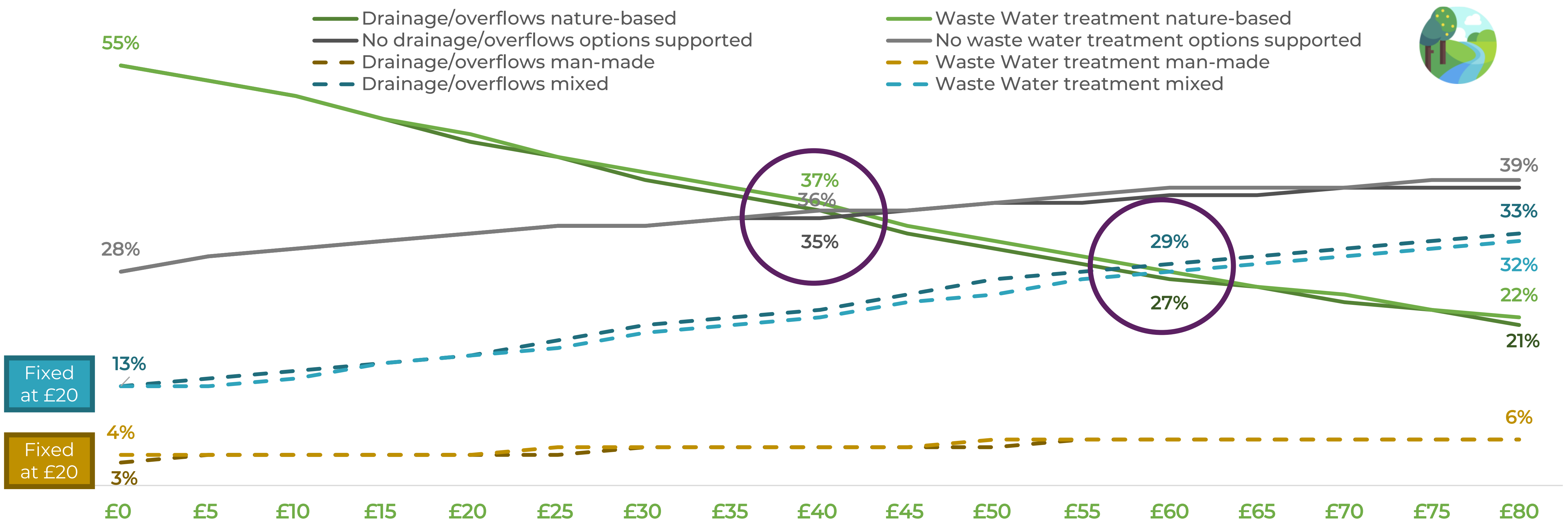
Llais defnyddwyr dŵr

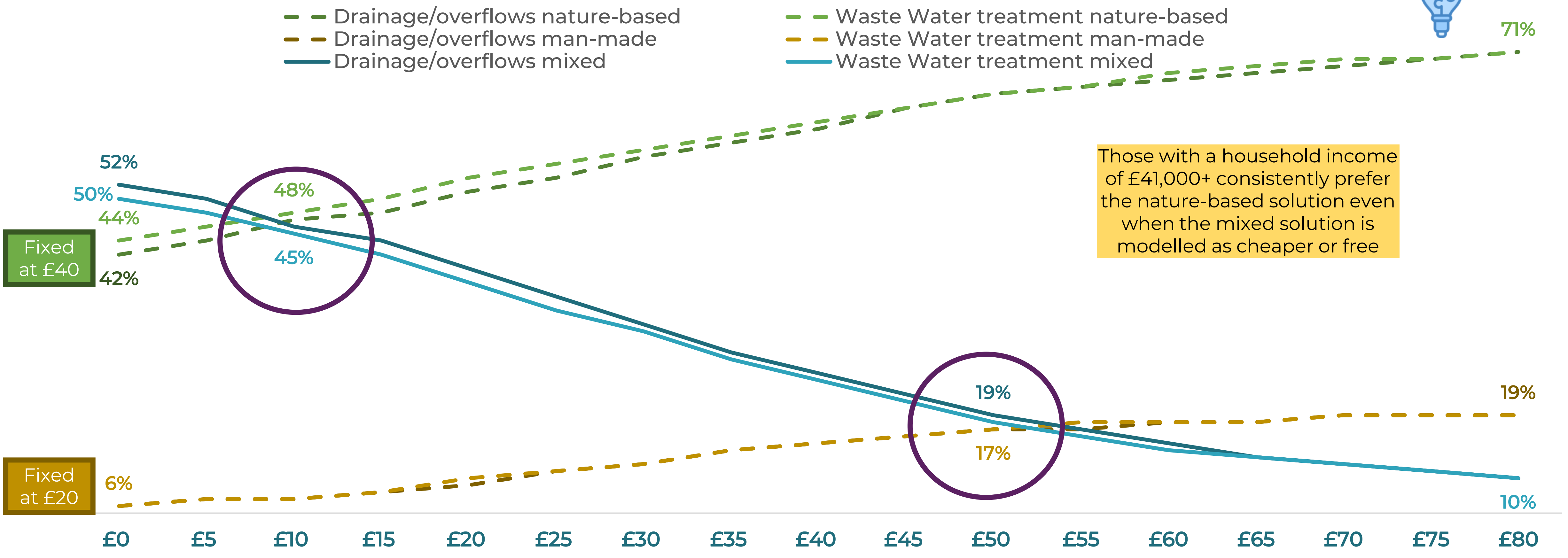
Share of support by bill price change for the nature-based solution



Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
The dashed lines represent the solutions that remain stable at £20 for this model. This model demonstrates which price point is likely to result in a decrease of consumer support

At a very low price (£0-5) a mixed solution is preferred, but once it becomes beyond £10 NBS ones become more preferrable

Share of preference by bill price change for the mixed solution



Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
The dashed lines represent the solutions that remain stable at £20 for the man-made solution and £40 for the nature-based solution solutions.
This model demonstrates which price point is likely to result in a decrease of consumer support

When looking at share of support mixed, NBS and not supporting any of the options perform similarly

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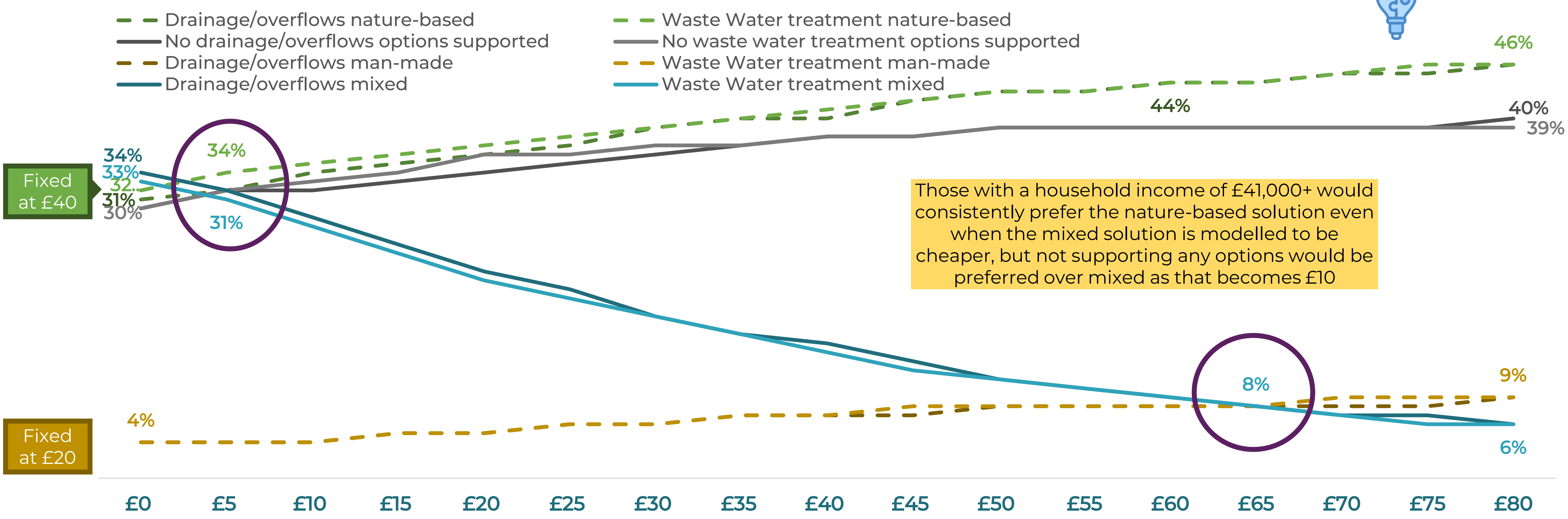
Share of support by bill price change for the mixed solution



Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
The dashed lines represent the solutions that remain stable at £20 for the man-made solution and £40 for the nature-based solution. This model demonstrates which price point is likely to result in a decrease of consumer support

A man-made solution is the least preferred even when free, with NBS being the most preferred

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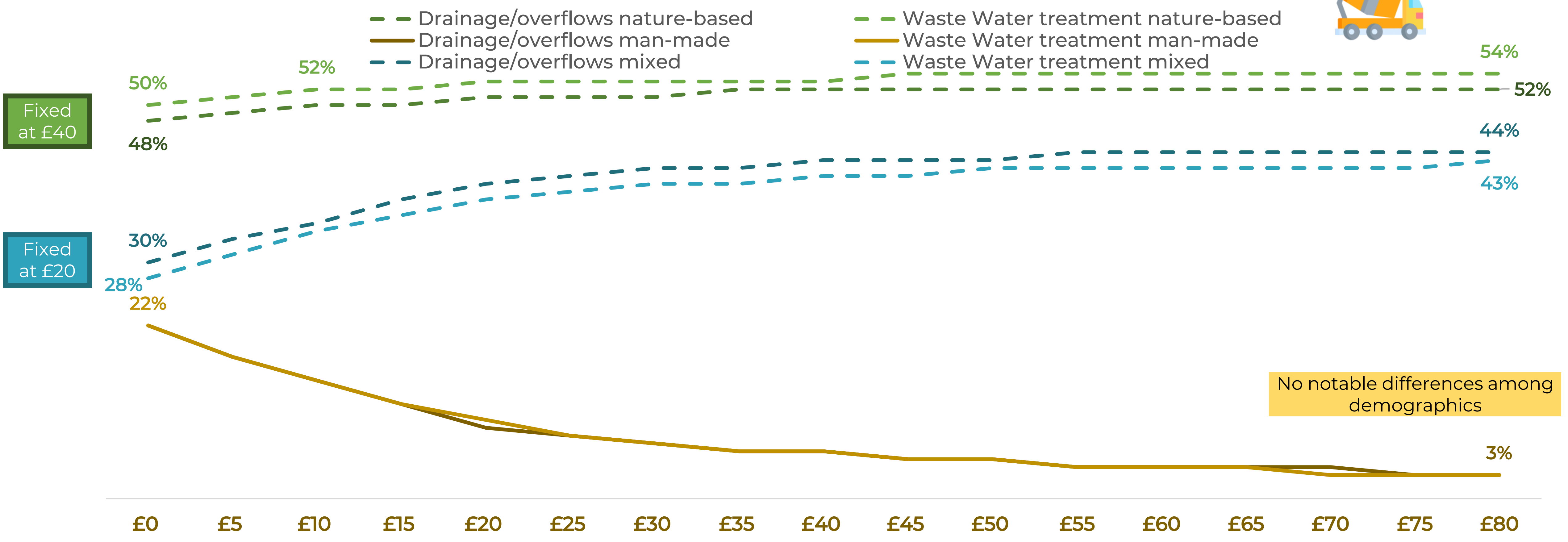
Share of preference by bill price change for the man-made solution



Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
The dashed lines represent the solutions that remain stable at £20 for the mixed solution and £40 for the nature-based solution. This model demonstrates which price point is likely to result in a decrease of consumer support

Similarly, when looking at share of support the man-made solution is the least popular even when free

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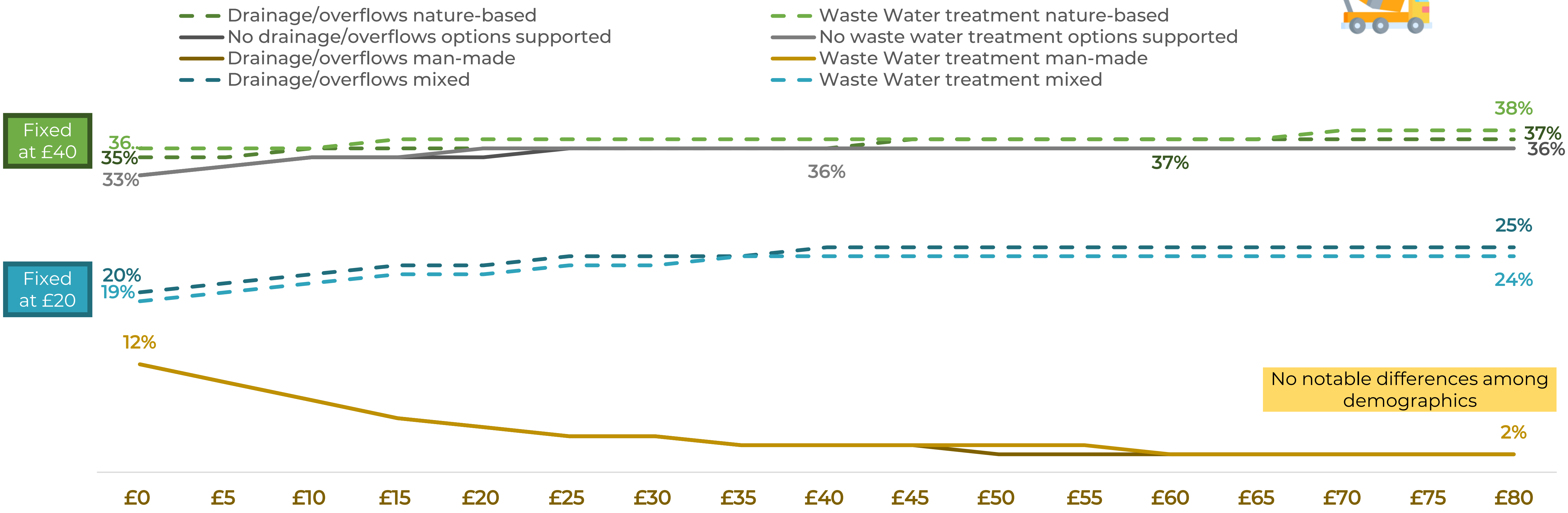
Share of support by bill price change for the man-made solution



Base (weighted): Drainage/Overflows (1,159); Waste Water treatment (1,161)
The dashed lines represent the solutions that remain stable at £20 for the mixed solution and £40 for the nature-based solution. This model demonstrates which price point is likely to result in a decrease of consumer support

Conclusions

What is this telling CCW?

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- There is a strong **consumer preference for water companies to utilise water solutions that are environmentally friendly – even if this means a rise in annual household water bill**. However, there is underlying consumer scepticism over whether water companies that are perceived to be performing poorly will be able to implement NBS.
- Nevertheless, consumers are more supportive of environmentally friendly solutions (nature-based or mixed) than man-made ones even when the environmentally friendly options add more to their bills – up to the tested maximum of £80.
- There is evidence of consumer support for **nature-based solutions** that entail a **household bill price rise of up to £40**. Based upon our modelled options, a bill price rise of up to £40 is supported for a nature-based solution vs. a man-made, mixed solution or else support none. Beyond £40, consumer support for nature-based solutions diminishes in comparison to consumers supporting none of the solutions modelled.
- If water companies anticipate a larger rise in household water bills in order to fund nature-based or mixed solutions, consumers need to be given reassurance of exactly **where the investment is going and how they or the environment will benefit** from it. Clearly articulating to consumers that the solution will be long lasting (20+ years), be completed relatively soon (within two years) and will have specific environmental benefits that will be beneficial to them or the environment is likely to help garner consumer support for such projects.

Appendix

Scope of this report (quantitative)

The voice for water consumers

Scope

This report aims to establish attitudes and behaviours of the overall England and Wales population and highlights results at an overall level as well as by the key sub-groups (see Table 1). It provides a robust sample to be able to analyse the data on this basis.

The statistical reliability of the data at 95% confidence level is outlined in Table 1

In addition to highlighting key subgroups significantly different to the total, results are also shown for other subgroup categories of interest when data is significantly different to the total.

NB: Data may not sum to 100% due to rounding, multi choice questions or non display of other/don't know options

Table 1

	Key subgroups	Unweighted Sample Size		Weighted Sample Size		Margin of Error for response of 50%*	
		Drainage/ Overflows	Waste water treatment	Drainage/ Overflows	Waste water treatment	Drainage/ Overflows	Waste water treatment
	Total sample	1,158	1,162	1,159	1,161	+/- 2.9%	+/- 2.9%
Region	England	943	945	1,095	1,097	+/- 3.0%	+/- 3.0%
	Wales	215	217	64	64	+/- 12.2%	+/- 12.2%
Type of area	Urban	513	498	519	493	+/- 4.3%	+/- 4.4%
	Rural	645	664	640	668	+/- 3.9%	+/- 3.8%
Age	18-34	323	327	339	334	+/- 5.3%	+/- 5.4%
	35-54	403	410	406	411	+/- 4.9%	+/- 4.8%
	55+	432	425	415	416	+/- 4.8%	+/- 4.8%
Responsibility for water	Bill Payer	1,070	1,059	1,067	1,057	+/- 3.0%	+/- 3.0%
	Non-Bill Payer	86	98	90	98	+/- 10.3%	+/- 9.9%
Income	Up to £14,000	190	191	213	221	+/- 6.7%	+/- 6.6%
	£14,001-£28,000	430	413	457	440	+/- 4.6%	+/- 4.7%
	£28,001-£41,000	323	337	317	329	+/- 5.5%	+/- 5.4%
	£41,001+	171	171	128	121	+/- 8.7%	+/- 8.9%

*Based on the weighted base sizes as the Conjoint analysis requires the use of the weighted data. Bases below 100 must be treated with caution and only as indicative

Reasons behind chosen methodology

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A key issue for this research was to find a way of presenting nature-based and man-made solutions to people in a way that supported them to consider what these solutions deliver in relation to the issues they are seeking to address. This needed to be done in a way that minimised unconscious bias towards green, natural, environmentally-friendly sounding approaches.

For that reason, the survey avoided using the term 'nature-based', and the conjoint approach (more on the next slide) allowed the characteristics (attributes) of different solutions to be set out with different options (levels) for each. The way the conjoint exercise is presented means that respondents did not necessarily compare a nature-based vs. mixed vs. man-made solution. Rather, the conjoint assessed preference and support for the each of the attributes and levels that comprise a solution. This allows the modelling of preference and support any combination of the attributes and levels tested.

The qualitative research was designed to test whether there was any shift in views from preferences seen in the quantitative research once people saw examples of solutions, and to better understand why they preferred or rejected certain solutions.

Quantitative scenarios tested and the sample split

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The sample was split into two: one half was given context about drainage and overflows, the other about waste water treatment. Samples for each group were matched. Throughout the report, they are referred to as Drainage/Overflows and Waste water treatment.

Below is the context shown to survey respondents for **Drainage/Overflows**:

Sewage flooding can happen when heavy rainfall going into the sewer exceeds the capacity of the sewer or treatment works. Storm overflows are built into the sewage system, to release this mix of sewage and rainwater into rivers and seas in order to reduce the risk of homes and businesses being flooded. Last year, storm overflows were used more than 300,000 times in England and Wales.

In order to protect properties from flooding and reduce or remove the need for sewage to be released into rivers and seas, water companies need to install solutions to capture excess rainwater that falls during storms, so that it does not overwhelm the sewage system.
These solutions come in different forms, with different pros and cons and you will be presented with some of them across the next screens.
Thinking generally, which of the different options below for managing storm overflow is most appealing to you?

Please see the following slide for the context given to survey respondents for Waste Water Treatment.

Quantitative scenarios tested and the sample split

The voice for water consumers
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Below is the context shown to survey respondents for **Waste Water Treatment**:

A government report last year found that in Wales only 45% and in England only 16% of rivers, lakes and streams are classified as having good ecological status.
There are three main sources of pollutants:

1. runoff from animal manure and fertilisers spread onto farmland, which goes into ditches, streams, rivers, ponds and lakes
2. industrial liquid wastes released in rivers, which contain several chemicals detrimental to the environment
3. untreated sewage released from sewers and treatment plants to avoid sewer flooding during heavy rain when the pipes would be otherwise unable to cope

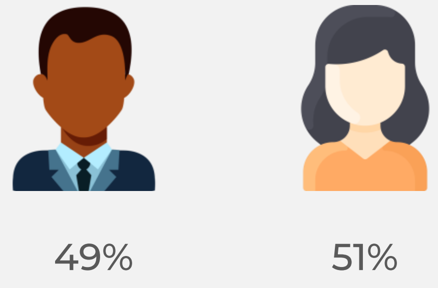
In order to help remove these types of pollution from rivers and streams and reduce the damage to wildlife, water companies need to install solutions to clean the water before it is released.
These solutions come in different forms, with different pros and cons and you will be presented with some of them across the next screens.
Thinking generally, which of the different options below for removing pollution from rivers and streams is most appealing to you?

Quantitative respondent profile

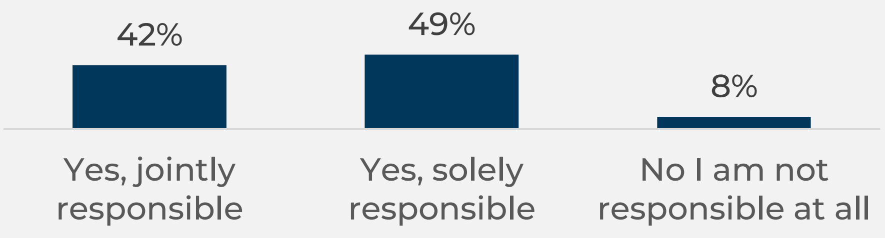
The voice for water consumers
Llais defnyddwyr dŵr

Weighted data

Gender

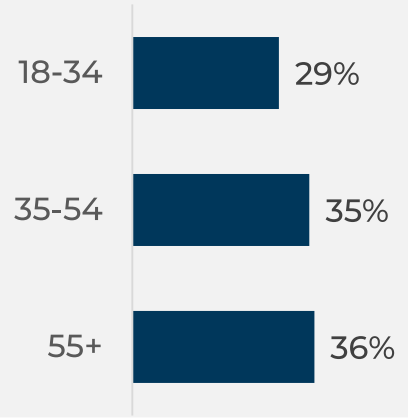


Responsibility for water bill

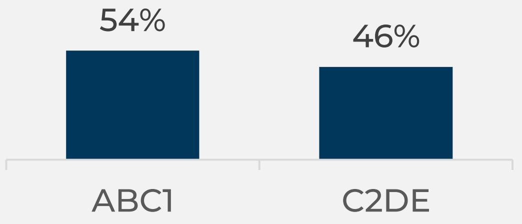


England vs Wales

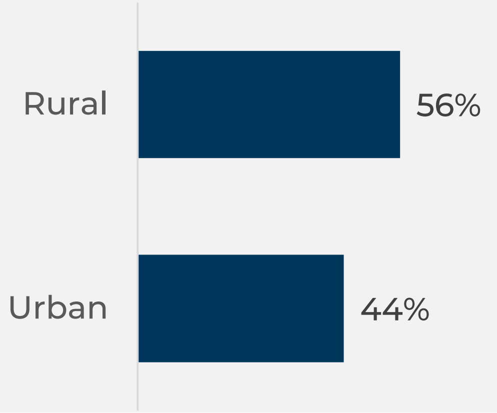
Age



Social grade*



Type of area



*Social grade is a demographic classification based on the occupation of a household's chief income earner. AB is higher or intermediate, managerial, administrative or professional; C1 is supervisory or clerical and junior managerial, administrative or professional; C2 is skilled manual workers; DE is semi-skilled and unskilled manual workers, state pensioners, casual workers and unemployed with state benefits only

Quantitative limitations of this report

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Specific to the conjoint exercise, some limitations to be aware of include:

- Infrastructure solutions must comprise of the attributes and levels tested within the conjoint exercise, e.g. max bill price rise of £80 can be tested.
- Relative importance of levels can be compared within an attribute, but not between attributes.
- Respondents were thinking of an infrastructure requirement at a high level and the quantitative findings in this report gives overall themes that are not specific to individual solutions due to how varied they can be. The aim of the qualitative work was to explore this in further detail.
- There were limited demographic differences and any have been flagged with call out box.

Three days into fieldwork, an article went live across national news discussing potential bill rises in order to upgrade the water infrastructure. We have added a filter to the data in order to monitor any effects this may have had on respondent views but found that this didn't have an impact on the results.

The Times

Why water bills are going up, and how you can cut yours - Times Money Mentor

How much more could I have to pay under new proposals? Water bills are set to rise by an average of 35% between now and 2030, depending on your...

The Independent

Water firms want bills to rise £156 to help them stop sewage spills

The water industry said the £96 billion investment will reduce sewage spills and leaks, while helping to secure future supply.

BBC

Water firms want bill rises to cut leaks and spills

Water firms want bill rises to cut leaks and spills ... Water companies in England and Wales want bills to increase by £156 a year by 2030 to pay...

The Guardian

English water firms face backlash over plans to ask customers to pay £96bn to cut leaks

English water firms face backlash over plans to ask customers to pay £96bn to cut leaks ... Water companies are facing a backlash from campaigners...

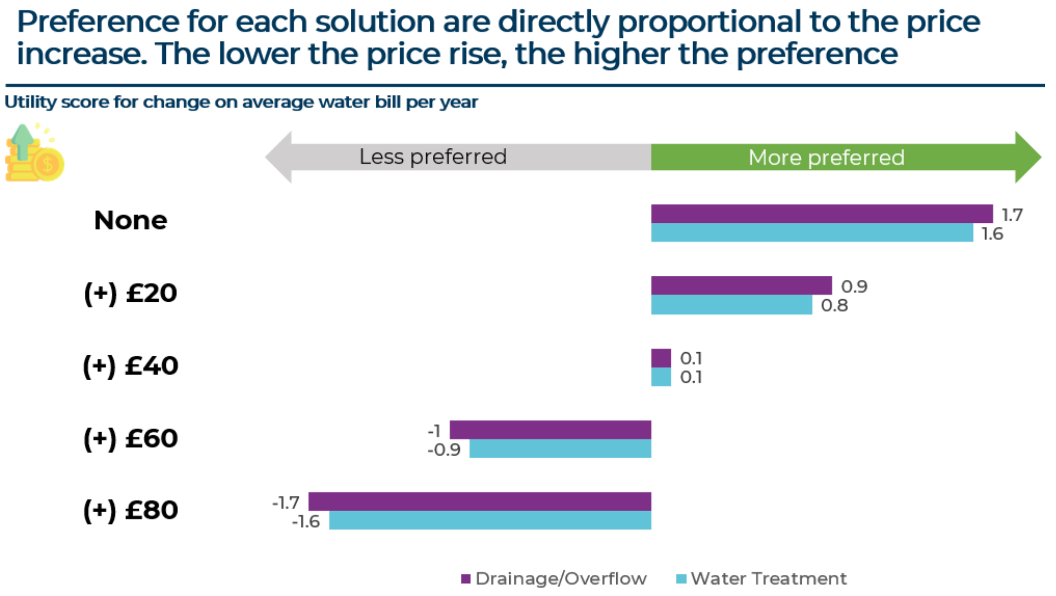
Understanding Utility Scores

The voice for water consumers
Llais defnyddwyr dŵr

These are outputs from the Conjoint analysis which show the ‘value’ of each item relative to the other items tested within that attribute.

As an example, on the right we have the utility scores for average bill increase. We know from slide 16 that average bill increase has a relative importance of 33%/32% in determining preference. The utility scores themselves (e.g. 1.7, -1.7 etc.) do not have any specific interpretations. For example, they **cannot** be used to say that ‘X% would prefer an option if it had no price increase’. What utility scores **can** be used for it to **compare the appeal** of different levels within an attribute.

The utility scores on the right show us that no price increase and (+) £80 have the strongest relative value out of the 5 options tested within average bill increase. No price rise is strongly preferred, whilst (+) £80 is not at all preferred. The scores for (+) £20 and (+) £60 are almost opposites of each other too, which is why we conclude that there is a linear relationship between average bill increase and preference.



NB. Sub-group comparisons of utility scores compare the sub-group utility scores rather than percentages as the score are not comparable to percentages.

Qualitative pre-task stimulus (1)

The voice for water consumers
Llais defnyddwyr dŵr

Flooding/Storm Overflow solutions

Sewage flooding can happen when heavy rainfall going into the sewer exceeds the capacity of the sewer or treatment works. The sewage system is designed to release this mix of sewage and rainwater into rivers and seas in order to reduce the risk of homes and businesses being flooded. Last year, these 'storm overflows' were used more than 300,000 times in England and Wales.

In order to protect properties from flooding and reduce or remove the need for sewage to be released into rivers and seas, water companies need to install solutions to capture excess rainwater that falls during storms, so that it does not overwhelm the sewage system.

There are two ways of doing this.

Option 1: Capturing and storing rain water after it enters the sewers

- Large concrete tanks are typically built underground, to create extra storage during periods of heavy rain. Water is diverted from the sewer into the tank, and only released into the sewage system when there is room for it.
- Cost depends on size – the example below, from Ballymena, Co Antrim – in a part of town prone to flooding - is an $850m^3$ tank and cost around £2m (and just over a year) to complete.
- It has made flooding much less likely (there hasn't been any since installation) and also provides protection against 'a 1-in-30 year rainfall event' provided that weather is not more unpredictable/extreme than has been modelled.
- Pictures (during construction and finished)

Option 2: Stopping rainwater getting into sewers

- This means holding water in the landscape to slow its flow to the sewer, and involves landscaping, planting trees and other green spaces, designed to absorb excess rain water
- Example of 'Greener Grangetown' – a series of landscape drainage solutions covering an area of 12 streets (550 properties) in Cardiff.
- These included 127 new trees, 1,700m2 of new green space and 108 rain gardens (see illustration below).
- This approach absorbs excess rainwater, with this example removing an average of 40,000m3 of surface runoff from the combined sewer system **over the course of a year,** providing a longer source of capacity.
- It took 18 months and £3m to construct.

Qualitative pre-task stimulus (2)

The voice for water consumers
Llais defnyddwyr dŵr

Water treatment solutions

A government report last year found that in Wales only 45% and in England only 16% of rivers, lakes and streams are classified as having good ecological status.

There are four main sources of pollutants;

1. Rainwater washing animal manure and fertilisers spread onto farmland into ditches, streams, rivers, ponds and lakes
2. Rainwater washing chemicals, rubber and plastics from roads and motorways into ditches, streams, rivers, ponds and lakes
3. Industrial liquid wastes released in rivers, which contain several chemicals detrimental to the environment
4. Untreated sewage released from sewers and treatment plants into rivers etc to avoid properties being affected by sewage flooding during heavy rain when the sewer is not big enough to cope

In order to help reduce and/or remove these types of pollution from rivers and streams and reduce the damage to wildlife, water companies can install solutions to clean the water before it is released back into rivers or streams.

Option 1: building new/improving treatment at water treatment plants

- Example of a series of five new water treatment units installed by United Utilities in north Manchester area: to treat phosphorus levels at five existing wastewater plants around the area.
- This is a £15m programme of work, covering an area of about half a million people. Construction on all five sites took a little over a year on existing sites so disruption to the public was minimal.
- The solution involves chemical treatment of the effluent water, which is then pumped into local rivers. It also requires storage facilities for the biosolids that are removed from the water (see tank pictures below).
- The biosolids' are usually either incinerated, added to landfill or used on land as fertilisers.

Option 2: building in drainage in the landscape to filter water

- Wessex Water's wetlands construction at their Cromhall Water Recycling Centre in south Gloucestershire removes phosphorus from sewage effluent before it is released into nearby Tortworth Brook.
- Wetlands use vegetation, soil, and organisms to treat wastewater. These enable water companies to operate in remote areas with no sewer connection. An acre of wetland can clean an estimated 700,000 litres of water a day.
- Before the wetland's construction, the brook had not been meeting water quality targets, specifically for phosphorous. Since its construction, there has been:
  - 27.5% reduction in total phosphorus
  - 62% reduction in ammonia
  - more than 60% reduction in nitrogen
  - 111% increase in biodiversity value.
- Cost £2m – though covers a much smaller area (population roughly 2,000 people).
- It took 12 months to build but several years of discussion and working with different landowners to get to the build stage.

Please note, to aid participant comprehension the basic term 'water treatment' was used within qualitative fieldwork, though the case studies used examples of both waste water treatment and water filtration in the natural environment

Qualitative pre-task stimulus (3)

The voice for water consumers
Llais defnyddwyr dŵr

Questions for reflection:

1. How do you feel about the issues which the solutions are trying to address? Have you ever personally been affected by them?
2. What stands out to you about these different solutions?
3. For each option, what features and aspects of it do you like and which do you dislike?
4. What questions do you have about these solutions? What would you like to know about this?
5. How would you feel if these solutions were implemented in your area?
6. Which solution do you think would be the most effective and why?

Within the qualitative sessions explanations of the issues were given, followed by example scenarios

The voice for water consumers
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Waste Water Treatment

A government report last year found that in Wales only 45% and in England only 16% of rivers, lakes and streams are classified as having good ecological status.

There are four main sources of pollutants:

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2.Rainwater washing chemicals, rubber and plastics from roads and motorways into ditches, streams, rivers, ponds and lakes

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- Cost £2m – though covers a much smaller area (population roughly 2,000 people).
- It took 12 months to build but several years of discussion and working with different landowners to get to the build stage.

Flooding/Use of Storm Overflows stimulus

The voice for water consumers
Llais defnyddwyr dŵr

The issue: Flooding/Use of Storm Overflows

Sewage flooding can happen when heavy rainfall going into the sewer exceeds the capacity of the sewer or treatment works. The sewage system is designed to release this mix of sewage and rainwater into rivers and seas in order to reduce the risk of homes and businesses being flooded. Last year, these 'storm overflows' were used more than 300,000 times in England and Wales.

In order to protect properties from flooding and reduce or remove the need for sewage to be released into rivers and seas, water companies need to install solutions to capture excess rainwater that falls during storms, so that it does not overwhelm the sewage system.

Option 1: Capturing and storing rain water after it enters the sewers

Large concrete tanks are typically built underground, to create extra storage during periods of heavy rain. Water is diverted from the sewer into the tank, and only released into the sewage system when there is room for it.

The cost depends on size – the example below, from Ballymena, Co Antrim – in a part of town prone to flooding - is an 850m3 tank and cost around £2m (and just over a year) to complete.

It has made flooding much less likely (there hasn't been any since installation) and also provides protection against 'a 1-in-30 year rainfall event' provided that weather is not more unpredictable/extreme than has been modelled.

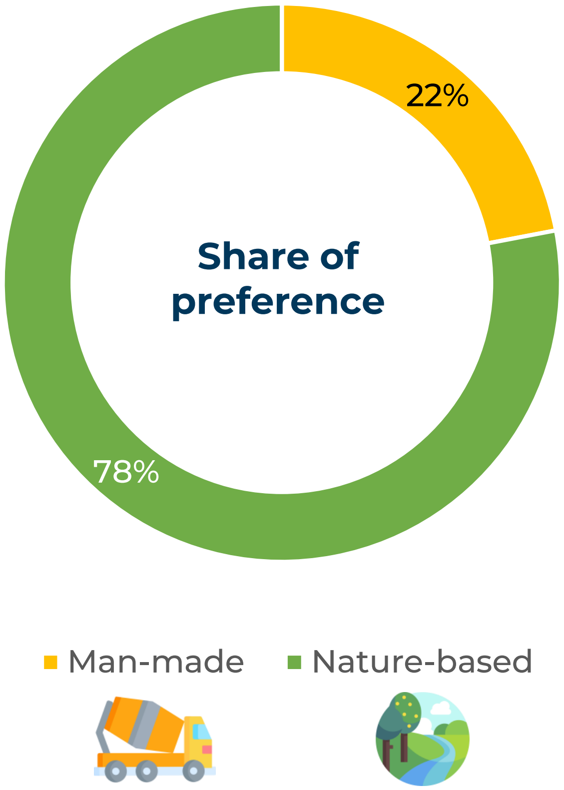
Option 2: Stopping rainwater getting into sewers

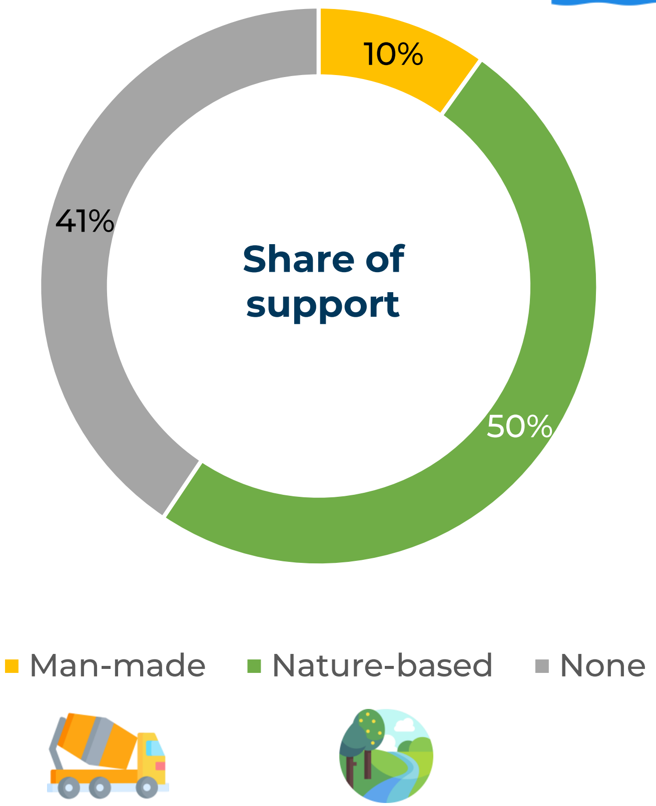
This means holding water in the landscape to slow its flow to the sewer, and involves landscaping, planting trees and other green spaces, designed to absorb excess rain water

Example of 'Greener Grangetown' – a series of landscape drainage solutions covering an area of 12 streets (550 properties) in Cardiff.
These included 127 new trees, 1,700m2 of new green space and 108 rain gardens.
This approach absorbs excess rainwater, with this example removing an average of 40,000m3 of surface runoff from the combined sewer system **over the course of a year,** providing a longer source of capacity.
If there was sudden flooding, a tank would be able to absorb more in one go.
It took 18 months and £3m to construct.

When comparing just NBS vs. man made for drainage/ overflows, the preference and support is for NBS

Preferences and support between the man-made and the nature-based solution for drainage/overflows



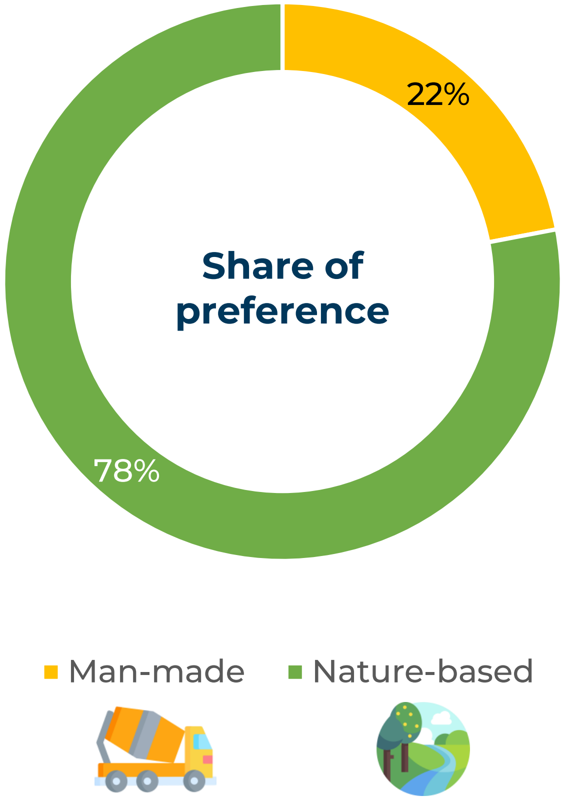


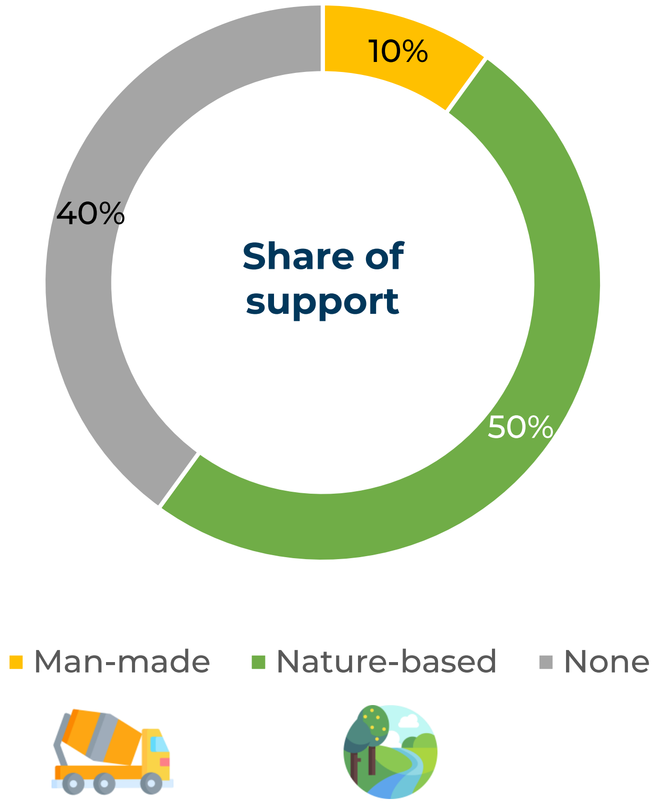
No notable differences among demographics

Similarly, when comparing just NBS vs. man made for waste water treatment, the preference and support is for NBS

The voice for water consumers
Llais defnyddwyr dŵr

Preferences and support between the man-made and the nature-based solution for waste water treatment





No notable differences among demographics

Thank you!

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