

UUW31

# Customer research triangulation

**October 2023**

Chapter 5 supplementary document

This document sets out how we have applied a robust framework to calculate marginal benefits for financial incentives related to our bespoke performance commitments. It covers the key aspects of valuation where we have triangulated a number of values from different aspects of research. It also covers the application of the framework to demonstrate the golden thread between customer research and the wider business plan.

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# 1. Customer research triangulation

## 1.1 Key messages

- We have applied a robust triangulation framework based on best practice to triangulate ODI rate valuations for our bespoke performance commitments and to ensure that our business plan is built upon customer priorities.
- We propose triangulated ODI rates for two of our bespoke PCs, and propose an external market valuation for the bespoke PC on embodied greenhouse gases following our proposals for the common PCs on operational greenhouse gases.
- Our approach to applying the framework has been externally assured with no material misalignment or issues identified.
- We have applied the triangulation framework to develop the 'golden thread' of customer insight to action, ensuring our key customer research sources inform the development and content of our business plan.

## 1.2 Structure

- 1.2.1 This document details the triangulation framework which we developed with a third party expert to prescribe the most robust way to source, triangulate and weigh up appropriate customer research and insight.
- 1.2.2 The application of a robust triangulation framework is particularly vital when producing valuations using more than one source of customer research or insight. This document then describes how we applied the framework for each bespoke performance commitment (PC) to calculate the value of the ODI rate.
- 1.2.3 These bespoke performance commitments and ODIs are detailed in *Chapter 5 – Delivering Great Service* and supplementary document *UUW30 – Performance Technical document*. This document does not cover common performance commitments, as we have used Ofwat's indicative ODI rates, where available, for all common PCs.
- 1.2.4 We have also applied the method of evaluating the robustness of customer research and insight to develop the 'golden thread' between customer priorities and support for our wider business plan.
- 1.2.5 This document is structured as follows;
- Section 2: Our triangulation framework
  - Section 3: Triangulating incentive valuations for bespoke performance commitments
    - Section 3.1 Bespoke PC: PR24\_EGG Embodied greenhouse gas emissions
    - Section 3.2 Bespoke PC: PR24\_WIN Wonderful Windermere
    - Section 3.3 Bespoke PC: PR24\_IBA Improving water bill affordability for socially important non-household community groups
  - Section 4: Customer and stakeholder support for our bespoke performance commitments
  - Section 5: Applying the framework to demonstrate the golden thread between our customer research and insights, and our wider business plan

## 2. Our triangulation framework

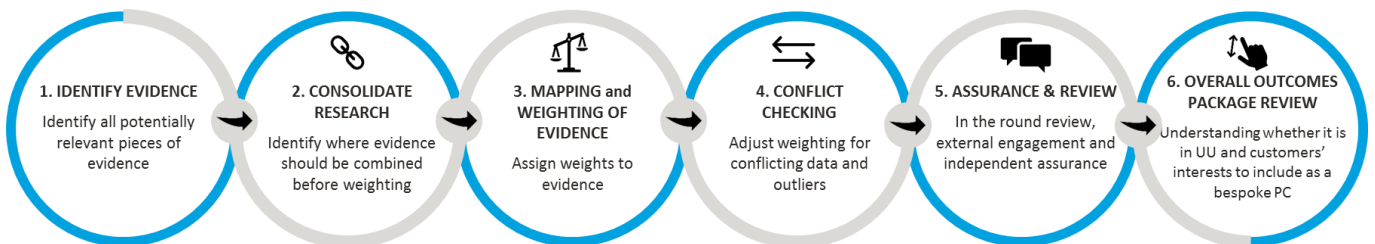
### 2.1 Development of our triangulation framework

- 2.1.1 We developed a triangulation framework, in collaboration with Frontier Economics, to set out the ground rules on how to triangulate and map customer research and insight sources to value incentive rates for our bespoke performance commitments using a bottom-up approach.
- 2.1.2 The objective was to develop a robust and consistent framework for triangulation, drawing on the best practice from the water sector and other sectors where relevant.
- 2.1.3 We recognised the need for this framework following:
  - (a) feedback received from Ofwat both by UUW and the wider industry at PR19;
  - (b) the publication of ICF and CCW triangulation guidance (July 2017) in advance of PR19; and
  - (c) further guidance on triangulation methods by SIA Partners and CCW (May 2021) following PR19;
 The framework therefore incorporates the principles, best practice, and guidance from these sources, as well as other sources such as the government’s Magenta book, and other sectors (such as the energy and healthcare sectors).
- 2.1.4 Once we had commissioned and worked through this framework, Ofwat also shared with the industry their initial approach to mapping the collaborative customer research values to ODI rates for the common PCs. In late May 2023 Ofwat changed their approach to use a top-down valuation for common performance commitment financial incentives, and thus adjusted their guidance to state that companies could also employ top-down approaches or apply credible external evaluations in determining rates for bespoke performance commitments<sup>1</sup>.
- 2.1.5 We have therefore used a mixture of customer valuations and credible external valuations as part of our approach to triangulating financial incentive rates for bespoke performance commitments alongside the triangulation framework, and discuss this in detail in section 3 Triangulating incentive valuations for bespoke performance commitments.
- 2.1.6 We have also applied parts of the framework to evaluate the robustness and relevance of our customer research and insights, as part of the development of the golden thread between customer priorities and the shape of our wider business plan (Section 5, Applying the framework to demonstrate the golden thread between our customer research and insights, and our wider business plan).

### 2.2 Applying the framework to calculate incentive rates

- 2.2.1 This section gives an overview of the six steps in the framework (Figure 1) and how these are applied to triangulate the incentive rates for each relevant bespoke PC. Detailed examples of how we have applied steps 1 to 4 of the framework are explained in sections 3.2 and 3.3.

Figure 1: The six step process of the triangulation framework



Source: PR24 Triangulation and mapping framework

<sup>1</sup> Ofwat; Summary of discussion at June 2023 Outcomes Working Group – ODI Rates (29<sup>th</sup> June 2023)

### Step 1: Identify evidence

- 2.2.2 The objective of this step is to identify all potentially relevant evidence, customer research, engagement and insight to ensure there is a comprehensive list to take through triangulation, which may involve excluding some evidence if it is not sufficiently robust, or relevant
- 2.2.3 We have a comprehensive programme of customer research and processes designed to gather customer insight throughout the year<sup>2</sup>. We have considered the use of this information in the valuation of financial incentive rates for our bespoke PCs. We have considered relevant external valuations where pertinent to the bespoke PCs proposed, including Ofwat's PR24 collaborative research for common PCs. As well as customer valuations, we also considered relevant operational or internal data, as well as third party data and reports.
- 2.2.4 We used the framework to evaluate the various information sources, and used the most suitable sources based on the criteria set out upfront in the framework. We assessed at a high level the type, age, relevance and robustness of the evidence to determine whether to include it in the triangulation process, taking a balanced approach to maximising applicability versus loss of data.
- 2.2.5 Table 1 shows which customer research has contributed to the assessment for each bespoke PC. Embodied greenhouse gas (GHG) emissions is omitted from the table as it was not triangulated using the framework and instead aligned to a credible external evaluation, a method and valuation which we also propose for the two operational GHG common performance commitments (see section 3.1).

### Step 2: Consolidate research

- 2.2.6 This step identifies where evidence should be combined before weighting, by determining which pieces of evidence are not independent of one another and therefore would be over-weighted if they were considered separately in the next step.
- 2.2.7 To determine if evidence required consolidation, we considered if the pieces of evidence:
- Used the same methodology and research question;
  - Had overlapping demographic groups; and,
  - The data was gathered within the same six month period.

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<sup>2</sup> More details on this can be found in Chapter 3 and are publicly available on our website at: [unitedutilities.com/corporate/about-us/our-future-plans/listening-to-our-customers](https://unitedutilities.com/corporate/about-us/our-future-plans/listening-to-our-customers)

**Table 1: Customer research and other evidence considered for triangulation in step 1 of the framework**

Evidence	Time period	Wonderful Windermere	Improving water bill affordability for socially important non-household community groups
Customer Listening	May 2022	✓	
Data from water efficiency visits to schools in Greater Manchester	March 2023		✓
DWMP Acceptability Testing Draft and Final	November 2022 and May 2023	✓	
Green Recovery	2021	✓	
National Water Environment Benefit Survey <sup>3</sup>	2012	✓	✓
Ofwat collaborative ODI research / Ofwat common performance commitment rates	2023	✓	✓
Thames Water: PR24 Smart Metering and Water Efficiency Q&A all-company open call (Smart Business visits data)	2016–2022		✓
Thames Water: Proposal for PR24 water efficiency performance commitment	June 2022		✓
UUW NEIRF Report	2022	✓	
UUW Wastewater Treatment Works to Technically-Achievable Limits estimates	2022/23	✓	
UUW Wholesale charges schedule	2023/24		✓
Outdoor Recreation Valuation Tool (ORVal) <sup>4</sup>	2018	✓	
Windermere Catchment: Tourism Value (commissioned by the Environment Agency)	2021	✓	
Windermere Water Quality Management Opportunities Project Report	2022	✓	

Publicly available UUW customer research can be found on our website<sup>5</sup>.

### Step 3: Mapping and weighting of evidence

- 2.2.8 The objective of this step is two-fold: first to map the evidence to the bespoke PC metric; and then providing a framework and ground rules for how to weight each piece of evidence.
- 2.2.9 Quantitative evidence carried forward from step one is assessed in more detail for its relevance and robustness and assigned scores of 0 to 3 for seven criterion to calculate an overall score. The most relevant and robust evidence scored highest, and was assigned more weight during the triangulation of the values. This weighting approach based on an assessment of the quality of the evidence is in-line with Ofwat's expectations of best practice

<sup>3</sup> [assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/291464/LIT\\_8348\\_42b259.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291464/LIT_8348_42b259.pdf)

<sup>4</sup> [leap.exeter.ac.uk/orval/](https://leap.exeter.ac.uk/orval/)

<sup>5</sup> [unitedutilities.com/corporate/about-us/our-future-plans/listening-to-our-customers/insight-and-research-library/](https://unitedutilities.com/corporate/about-us/our-future-plans/listening-to-our-customers/insight-and-research-library/)

#### Step 4: Conflict checking

- 2.2.10 This objective of this step is to identify, understand, and deal with any outliers, conflicts, or counter-intuitive results in a consistent way. This step does not provide an opportunity to exclude results without any good reason.
- 2.2.11 We checked for conflicts between valuations arising from different information sources. Conflicts could include mathematical outliers in the range of resulting valuations, counter-intuitive results (e.g. customers valuing external flooding higher than internal flooding) or large changes in value over time.
- 2.2.12 Even if no conflicts or mathematical outliers were identified, we also conducted a sensitivity analysis on the triangulated financial incentive rate, to check that the triangulated marginal benefit was not significantly skewed by values falling outside of the interquartile range.

#### Step 5: Assurance and review

- 2.2.13 Once the valuation is calculated, it is reviewed to assure the overall approach and the set of valuations.
- 2.2.14 The resultant financial incentive rate and the method used to obtain it was then internally reviewed by managers with appropriate skills and externally assured by Turner & Townsend. The review provided assurance on the extent to which we robustly applied our triangulation framework in the calculation of ODI rates for bespoke PCs.
- 2.2.15 The review found that the framework had been applied with no material misalignment or issues. For more information on our assurance approach and the conclusions from this, please see *Chapter 10 – Assurance and Track Record*.

#### Step 6: Overall outcomes package review

- 2.2.16 The objective of this step is to review the overall outcomes package when PCs and ODIs have been calculated. More details of this review of the overall ODI package are detailed in *Chapter 5 – Delivering Great Service*, section 5.11
- 2.2.17 We considered whether the incentive for each bespoke PC offered sufficient customer protection. We did this with reference to customer priorities and research indicating the service areas or issues targeted by our bespoke PCs are of high priority to customers in the North West (see section 4 for discussion of how customer priorities informs the focus of our bespoke PCs).
- 2.2.18 We evaluated whether it is in customers' and UUW's interests to include the proposed bespoke PCs, and decided to proceed with the proposed bespoke PCs.

## 3. Triangulating incentive valuations for bespoke performance commitments

### 3.1 Bespoke PC: PR24\_EGG Embodied greenhouse gas emissions

#### Introduction

- 3.1.1 Our bespoke PC focuses on mitigating the impacts of climate change through the reduction of greenhouse gas (GHG) emissions arising from construction activities from some of our largest wastewater treatment, non-infrastructure projects within the Water Industry National Environment Programme (WINEP).
- 3.1.2 It will measure against a baseline formed of the PR24 preferred solutions at final determination (subject to further review), versus actual emissions based on what has actually been built by our supply chain at the project in use gateway. It would therefore incentivise us to innovate and create lower embodied emissions solutions than what was originally planned at PR24.
- 3.1.3 This performance commitment will be measured by tonnes of CO<sub>2</sub>e. The full detail of the bespoke PC can be found in supplementary document *UUW30 - Performance commitments technical document*.

#### Financial incentive rate

- 3.1.4 Ofwat stated<sup>6</sup> that companies could use credible external valuations for the calculations of financial incentive rates, and that it proposes to use this approach for the two operational greenhouse gas emission common performance commitments. We suggest that the most suitable approach would be to match the ODI rates for the bespoke and common performance commitments, and to base that rate on the BEIS 2025 £/tCO<sub>2</sub>e 'low' carbon values, which is equal to £130/tCO<sub>2</sub>e. For further details on the common GHG PCs, please refer to supplementary document *UUW30 - Performance commitments technical document*.

### 3.2 Bespoke PC: PR24\_WIN Wonderful Windermere

#### Introduction

- 3.2.1 The Wonderful Windermere bespoke performance commitment will incentivise UUW to support the water quality, long term resilience and heritage of Windermere, one of England's most significant and iconic waterbodies, through the stewardship of catchment-wide solutions. By harnessing UUW expertise in wastewater treatment and innovative network management and looking beyond our own assets, UUW can act as a collaborative catchment convenor to facilitate and support the reduction of phosphorus inputs into the lake, by delivering solutions on wider catchment phosphorus inputs. This performance commitment will be measured in units of kg phosphorus removed. The full detail of the bespoke PC can be found in supplementary document *UUW30 - Performance commitments technical document*.
- 3.2.2 We present compelling evidence to support our valuation of the financial incentive for Wonderful Windermere, specific to the aims of the bespoke PC, the activity that will be carried out as part of the bespoke PC and with an incentive based on evidence specific to Windermere.

#### Applying the framework

- 3.2.3 The following sections explain how our framework was applied to develop a financial incentive rate for Wonderful Windermere. The framework was the basis of the methodology for triangulating evidence to produce a robust and fair financial incentive rate. Minor and logical adjustments were made to the methodology where required, for example when scoring evidence that was not a piece of customer

<sup>6</sup> "Our final methodology for PR24: Appendix 8 – Outcome delivery incentives", p24, Ofwat 2022



research, the 'sampling' criteria used to assess the sample size of a piece of customer research was not scored.

### Identify potentially relevant research

- 3.2.4 We collected relevant information regarding Windermere, customer insights and research, relevant investment programmes within the catchment, and any partnership work of a similar nature that we have previously, or are currently, involved in.
- 3.2.5 Any potential information was captured using a matrix that categorised potential evidence into the following categories:
- Ofwat valuations and research;
  - UUW customer research (separated into qualitative and quantitative);
  - Third party data; and,
  - Internal and/or operational data.
- 3.2.6 This demonstrated what type of information was available, and acted as a gap analysis exercise, to determine if any further specific customer research needed to be conducted for the triangulation of the financial incentive rate for the Wonderful Windermere performance commitment. Ten items of relevant evidence were identified across each of the categories (Table 2).
- 3.2.7 Using the first step of the framework, the ten pieces of evidence were given a high level review to determine whether or not they passed a minimum threshold for inclusion and a further, more detailed, assessment. This review was based on the characteristics of the evidence, such as the type, age, and relevancy of the evidence, and did not take into account any of the specific findings from the research. Table 2 shows the output of the review.
- 3.2.8 Eight of the ten pieces of evidence passed the threshold for inclusion, of which six pieces were quantitative, and two were qualitative. The two pieces of excluded evidence were older studies, or modelled based on older data.
- 3.2.9 On this basis, it was determined that no additional primary research needed to be carried out by UUW to support the triangulation of the financial incentive rate, as there was sufficient relevant quantitative information already available.

**Table 2: Identifying potentially relevant evidence**

Evidence	Study population	Relevance	Time period	Type	Summary	Include/exclude, and justification
UUW Customer listening research	UUW Customers		2022	Qualitative UUW Customer Research	Six regional focus groups asked about their engagement with water, environmental priorities and UUW responsibilities, and reactions to UUW goals and river health plan. Demonstrated that Cumbrian customers were typically more engaged as water very important to their work and recreation.	Include. Recent, qualitative, demonstrated that Cumbrian customers were typically more engaged as water very important to their work and recreation. Likely to be used for a cross-check in step 4 or for showing support for the performance commitment.
UUW DWMP and WRMP research	UUW Customers	Customer views on managing the land to improve water quality	2021	Qualitative UUW Customer Research	13% and 8% of customers ranked 'Managing the land to improve water quality' and 'working with other organisations' respectively as top priorities. Ranked 6th and 4th respectively overall out of 11 options.	Include. Recent, qualitative research asking customers to rank priorities, including 11 different solutions for the drainage and wastewater management plan. Likely to be used for a cross-check in step 4 or for showing support for the performance commitment.
Ofwat collaborative ODI research	UUW Customers	Customer WTP / WTA valuations for: river water quality; bathing Water status; and pollution events	2022	Ofwat customer research	Ofwat research to evaluate customer WTP / WTA for various service levels	Include. Recent, quantitative, based on UUW customers.
UUW Green Recovery	North West Region	Kg phosphorus removal from catchments (Eden and Greater Manchester)	2021	Quantitative UUW investment proposal	Catchment phosphorus removal, with cost per kg removed in rural and urban catchments	Include. Quantitative, recent (AMP7), phosphorus removal in two UUW catchments using catchment interventions
UUW NEIRF	Private non-UUW assets in UUW catchments	Kg phosphorus removal from septic tank effluent based on additional treatment with reactive media	2022	Quantitative UUW investment proposal	Estimates for the amount of phosphorus that may be removed through the installation of treatment media downstream of a septic tank and associated costs.	Include. Recent (within AMP7). Quantitative. Based on UUW paying a grant for septic tank owners to add a reactive media to their tank discharge to remove phosphorus. Cost based versus benefit/value.

Evidence	Study population	Relevance	Time period	Type	Summary	Include/exclude, and justification
UUW WwTW to Technically Achievable Limit (TAL) estimates	UUW Wastewater Treatment Works (WwTW)	Kg phosphorus / yr removal from UUW assets in Windermere catchment	2022	Quantitative UUW investment proposal	Estimated costs to take seven UUW wastewater treatment works discharging in Windermere catchment to the technically achievable limit for phosphorus.	Include. Based on UUW assets, recent (within AMP7), modelling phosphorus reduction using EA models, relevant to the PC (phosphorus removal in Windermere catchment), quantitative.
Windermere Water Quality Management Opportunities Project Report	Windermere catchment	Kg phosphorus / yr in Windermere catchment	2022	Third party quantitative report	The scale of kg phosphorus in the Windermere catchment from point and diffuse sources (non-UUW)	Include. Recent, relevant to the PC (phosphorus removal in Windermere Catchment), quantitative
Windermere Catchment: Tourism Value	Windermere catchment	What is Windermere worth to the economy and how can water quality impact that	2021	Quantitative report commissioned by the Environment Agency	Report commissioned by the Environment Agency. £ Value of Windermere to the local economy based on the direct/indirect impacts of tourism. Includes modelling of the impact if water quality should deteriorate.	Include. Recent, relevant to the PC (water quality in Windermere Catchment), quantitative, commissioned by our environmental regulator so therefore an accepted valuation.
<a href="#">Outdoor Recreation Valuation Tool (ORVal)</a>	UK modelled	Predicted visits to greenspaces and estimated welfare values in monetary terms	2018	University of Exeter model	Online tool for predicting the number of visits to greenspaces based on characteristics and a visitor model.	Exclude. Not recent. Not a count of visitors, results instead based on model predictions. Not able to account for each park's unique characteristics.
<a href="#">National Water Environment Benefit Survey</a>	England and Wales	Water framework directive class improvement	2012	Environment Agency Report	Values to improve water bodies from moderate to good status based on annual loadings into an area of waterbody.	Exclude. This is old research, and more recent and relevant quantitative evidence is available.

Publicly available UUW customer research can be found on our website<sup>7</sup>.

<sup>7</sup> [unitedutilities.com/corporate/about-us/our-future-plans/listening-to-our-customers/insight-and-research-library/](https://unitedutilities.com/corporate/about-us/our-future-plans/listening-to-our-customers/insight-and-research-library/)

### Consolidate research

- 3.2.10 Evidence was reviewed using a decision tree to check if any of the pieces of evidence were based on the same methodology and research question, had overlapping demographic groups, and if the data was from within the same six month period. Any overlapping evidence would require consolidation for the scoring and weighting step, in order to prevent over-weighting of that evidence during mapping.

**Table 3: Consolidation exercise for Wonderful Windermere evidence**

Evidence	Same methodology and research question?	Overlapping demographic group?	Same time period?
Ofwat customer research valuation	No	n/a	n/a
UUW NEIRF report	No	n/a	n/a
UUW WwTW to TAL estimates	No	n/a	n/a
Windermere Water Quality Management Opportunities Project Report	No	n/a	n/a
Green Recovery	No	n/a	n/a
Windermere Catchment: Tourism Value	No	n/a	n/a
Customer Listening	No	n/a	n/a
DWMP and WRMP immersive options research	No	n/a	n/a

- 3.2.11 None of the evidence had overlapping methodology, and therefore no consolidation was required and all evidence was treated individually for the remainder of the triangulation process.

### Weighting

- 3.2.12 The six pieces of quantitative evidence were assessed in more detail for robustness and relevance, and assigned scores for seven different criteria. As per the framework methodology, the qualitative research was not assessed using the scoring criteria.
- 3.2.13 Each of the seven criteria was scored 0 to 3, and higher scores were more favourable. The robustness and relevance scores were calculated by the mean score of the respective area's criteria. The robustness and relevance scores were combined for the total score. An example is given in Table 4.
- 3.2.14 The majority of evidence was not based on research from customers, therefore these pieces were not scored on the 'sampling' criteria and an "n/a" assigned. This did not affect the overall scores for each piece of evidence, as the robustness score was an average of the three remaining criteria.

**Table 4: Scoring the Windermere Water Quality Management Opportunities Project Report**

Area	Criteria	Questions	Criteria Score (0–3)	Average Area Score	Total score
Robustness	Methodology	What approach was used?	3	2.3	4.3
	Sampling	How large is the sample size / data set?	n/a		
	Evaluation	How was the study evaluated?	2		
	Cognitive validity	How did the study designers or data analysers factor in cognitive validity?	2		
Relevance	Mapping	How much mapping was required?	2	2.0	
	Level and range	How relevant are the service levels to the PC levels?	3		
	Customer base and context	How relevant is the customer base and wider context for UUW's customers?	1		

3.2.15 The six quantitative pieces of evidence scored between 3.7 and 4.3 (see Table 5 below). The framework does not specify a threshold score for determining the robustness and relevance of a piece of evidence, and whether it should be included, as this is relative to the quality and quantity of evidence available for the specific exercise.

**Table 5: Scoring results for each piece of evidence**

Evidence	Robustness score	Relevance Score	Total Score
Windermere Water Quality Management Opportunities Project Report	2.3	2.0	4.3
Windermere Catchment: Tourism Value	2.7	1.5	4.2
Ofwat collaborative ODI research	3.0	0.7	3.7
UUW NEIRF report	1.5	2.2	3.7
Green Recovery	1.5	2.2	3.7
UUW WwTW to TAL estimates	1.2	2.5	3.7

3.2.16 At this stage it was decided to exclude the Ofwat collaborative ODI research valuations from the triangulation approach. While the research is robust and has a valid methodology and scored well across all four robustness criteria, the valuations are very difficult to map to the Wonderful Windermere performance commitment using a bottom-up valuation methodology. Ofwat also encountered a number of challenges when seeking to map the valuations to common performance commitments. Without robust marginal benefit estimates from this mapping exercise, Ofwat instead used the valuations to provide customer priority rankings to inform a top-down approach to setting indicative ODI rates<sup>8</sup>.

### Overlaps with common performance commitments

3.2.17 In their initial feedback on the early submission bespoke performance commitments, Ofwat indicated a potential overlap between Wonderful Windermere and common performance commitments for river water quality, bathing water quality, and storm overflows. We responded to Ofwat in June 2023 to explain why we did not consider there was an overlap, with the storm overflow PC in particular. We also

<sup>8</sup> Ofwat, August 2023, 'PR24: Using collaborative customer research to set outcome delivery incentive rates': [ofwat.gov.uk/wp-content/uploads/2023/08/PR24-Using-collaborative-customer-research-to-set-outcome-delivery-incentive-rates-.pdf](https://ofwat.gov.uk/wp-content/uploads/2023/08/PR24-Using-collaborative-customer-research-to-set-outcome-delivery-incentive-rates-.pdf) (p38, section 5.3)

do not consider there is an overlap between the definition, measurement and incentive for the bespoke PC and the common PCs for river water quality and bathing water quality.

- 3.2.18 The primary focus of this bespoke performance commitment will be to deliver solutions on wider catchment phosphorus inputs, such as third party septic tanks, private sewage treatment works (for example treating waste from campsites) and from catchment runoff. Additionally, UUW has achieved required phosphorus reduction targets within the catchment for Water Environment (Water Framework Directive) Regulations 2017, but we will explore what opportunities and technologies can be developed to remove phosphorus from UUW assets beyond the current technically achievable limit, and where not already covered by the River Water Quality common PC. Hawkshead WwTW has an AMP8 driver for Habitat Directives, and therefore has further phosphorus reduction requirements, as such Hawkshead WwTW will be excluded from this performance commitment, avoiding any overlap between PCs. This performance commitment will look to push the frontier on treatment capabilities at other sites to deliver the greatest benefits to the Windermere catchment.
- 3.2.19 This bespoke PC is focused on leveraging our expertise to help everyone involved in the local catchment to act together to improve the health of Windermere. Harnessing the expertise that UUW has developed in wastewater treatment and innovative network management, UUW will apply this within the Windermere catchment to drive improvements that customers and communities expect to see.
- 3.2.20 We have six storm overflows that can impact Windermere. In contrast, there are over 80 permitted discharges (non-water industry) either into Windermere or a tributary and approximately 1,800 private septic tanks within the catchment, all owned and operated by someone other than UUW. We are of course very pleased to be able to undertake work – including that which was approved through the accelerated investment process – to reduce the activation of UUW’s storm overflows. This will act to improve the health of the lake by reducing spills. However, set against the significant number of non-UUW assets and discharge points around Windermere, this action alone is unlikely to be sufficient to drive the significant improvements that customers, communities and key stakeholders want to see for the lake and its water quality.
- 3.2.21 We therefore do not consider it necessary to remove any double count of financial incentive from any overlap with the common PCs from the calculation of this bespoke PC financial incentive.
- 3.2.22 We consider that a bottom-up approach using specific evidence centred on Windermere is the most robust and relevant way to value this bespoke performance commitment, as Windermere is a high value amenity of international significance. The lake is at the heart of a UNESCO world heritage site supporting a thriving local economy, and as such it is not comparable to the average river or waterbody in the UK. With such a strong and specific evidence base for the value of Windermere to the local economy, and the impact of water quality on this, we strongly believe this bottom-up approach best reflects the true value to the region and our customer base.

### Mapping a financial incentive rate

- 3.2.23 Five pieces of quantitative evidence were carried forward. The first step was to identify relevant information to help develop a financial incentive rate. The second was to adjust any financial values from the original price base into the PR24 price base using inflation assumptions consistent with data table *PD1*.
- 3.2.24 Two pieces of evidence provided values that matched the performance commitment measurement unit. These were adjusted to the PR24 price base, and used directly as potential valuations.
- 3.2.25 One piece of internal evidence required a price base adjustment, and some minor calculations to: remove a phosphorus reduction without an attributable cost; calculate a net present value on the whole life cost assuming a 20 year asset life (a typical asset life for interventions of this nature); and to convert the phosphorus reduction and whole life cost into a £ per kg of phosphorus per year.
- 3.2.26 The final two pieces of evidence scored highest overall. They had clear methodologies, mapped easily to the performance commitment measure with some simple calculations, and had evidence that the

results had been reviewed against other published values or had been subject to a peer review process. These two pieces of evidence were mapped together to calculate a £ value per kg of phosphorus per year for each of a low, medium and high impact scenario.

- The 'Windermere Water Quality Management Opportunities Project Report' provided a figure of 6,009 kg phosphorus per year discharging into Windermere and its tributary waterbodies from diffuse, septic tank and agricultural sources.
- The 'Windermere Catchment: Tourism Value' report (commissioned by the EA) provided £ values for the negative impact on the local tourism economy per year due to a deterioration in Windermere's water quality, in a low, medium, and high impact scenario. These were adjusted into the 2022-23 price base.
- A simple calculation to divide the £ value by the kg phosphorus load provided a low, medium, and high impact £ value per kg phosphorus per year (Table 6 below).

**Table 6: Values per kg phosphorus**

Scenario	Negative impact on local economy (£)	÷ Kg phosphorus	= £ per kg phosphorus
High	139,437,834	6009	23,205
Medium	83,662,700	6009	13,923
Low	27,887,567	6009	4,641

### Conflict checking

3.2.27 Following mapping, there were six values for kilogrammes of phosphorus removed per year, ranging from £1,995 to £25,375 with an even spread of values as seen in Table 7 below.

**Table 7: All six of the mapped values for the performance commitment**

Valuations	£ per kg phosphorus	Weighting score <sup>9</sup>	Weighting
UUW WwTW to TAL estimates	25,375	3.7	15%
High impact scenario <sup>10</sup>	23,205	4.3	18%
Medium impact scenario <sup>6</sup>	13,923	4.3	18%
UUW NEIRF	12,405	3.7	15%
Low impact scenario <sup>6</sup>	4,641	4.3	18%
Green Recovery	1,995	3.7	15%
<b>Weighted mean</b>	<b>13,615</b>		

3.2.28 The objective of the conflict checking step in the framework is to identify, understand, and deal with any outliers, conflicts or counter-intuitive results in a consistent way.

3.2.29 The data was evenly spread with two lower-, two mid- and two higher- range valuations. A sensitivity analysis was undertaken by removing the valuations which fell outside of the interquartile range of £6,582 to £20,884, leaving the two mid-range valuations. A weighted mean of £13,220 (Table 8) was calculated using the scores from the weighting step of the triangulation process.

<sup>9</sup> Weighting scores are shown in Table 5

<sup>10</sup> 4.3 is the mean of the two weighting scores for the two pieces of evidence used and rounded to 1 decimal place: 'Windermere Water Quality Management Opportunities Project Report' and 'Windermere Catchment: Tourism Value'

**Table 8: Weighting valuations to determine a marginal benefit rate**

Evidence used	£ / kg phosphorus	Weighting score	Weighting
Medium impact scenario	13,923	4.3	54%
UUW NEIRF	12,405	3.7	46%
<b>Weighted mean</b>	<b>13,220</b>		

3.2.30 The conflict checking step of the framework does not provide an opportunity to exclude results without any good reason. Comparing the results of the weighted mean of all six valuations (£13,615) with the weighted mean from the sensitivity analysis (£13,220) demonstrates that there is less than 4 per cent difference in results, an insignificant amount, and therefore there is no basis for excluding values from the triangulation.

3.2.31 The determined marginal benefit rate is therefore £13,615 per kg phosphorus removed.

3.2.32 This valuation is potentially understated for two reasons:

(a) Interventions to remove phosphorus discharges will function beyond the year of installation, for example the average lifespan of a farmyard intervention to reduce diffuse phosphorus discharging to watercourses is 21 years<sup>11</sup>. This delivers many years of valuable benefit beyond the years claimed in AMP9, however we will not be claiming for this additional benefit in the financial incentive rate for Wonderful Windermere. The incentive rate is therefore potentially understated.

(b) Nitrogen and phosphorus are key nutrients<sup>12</sup> involved in eutrophication of freshwater bodies. Some of the potential interventions to remove phosphorus discharges are likely to deliver multiple benefits, reducing other discharges such as nitrates, nitrous oxide, sediments, and ammonia. It is this wider outcome of water quality and health of the lake that this bespoke performance commitment is incentivising. Phosphorus was chosen to measure the success of this measure due to established and recognised methodologies. Therefore we consider the valuation for phosphorus as suitable for valuing the health of Windermere and do not propose to claim for additional benefits for nitrogen, although we acknowledge that these additional benefits exist and should arise.

### Customer sharing mechanism

3.2.33 The calculated marginal benefit rate for Wonderful Windermere is £13,615 per kg phosphorus removed.

3.2.34 A benefit sharing factor was applied, with a 70 per cent share, producing a final proposed financial incentive rate of £9,531.

$$\text{Marginal benefit rate} \times 0.7 = \text{financial incentive rate}$$

## 3.3 Bespoke PC: PR24\_IBA Improving water bill affordability for socially important non-household community groups

### Introduction

3.3.1 This bespoke performance commitment targets water efficiency and other customer-facing interventions at socially important non-household community groups. Working with customers and undertaking activities, including water efficiency audits, with the overall aim of increasing their water efficiency and reducing their bill. This PC aims to deliver a basket of interventions which should have the overall impact of improving water bill affordability for the targeted customer groups.

3.3.2 This performance commitment will be measured by the number of qualifying audits completed per year.

<sup>11</sup> Based on information about intervention lifespans provided by the Eden Rivers Trust June 2023

<sup>12</sup> Environment Agency 'Phosphorus and Freshwater Eutrophication Pressure Narrative' 2019: [https://consult.environment-agency.gov.uk/environment-and-business/challenges-and-choices/user\\_uploads/phosphorus-pressure-rbmp-2021.pdf](https://consult.environment-agency.gov.uk/environment-and-business/challenges-and-choices/user_uploads/phosphorus-pressure-rbmp-2021.pdf)



### Applying the framework

- 3.3.3 Our triangulation framework was the basis of the methodology for triangulating evidence to produce a robust and fair financial incentive rate. The following sections explain how the framework was applied to develop a financial incentive rate for this bespoke performance commitment.

### Identify potentially relevant research

- 3.3.4 Eight pieces of potentially relevant evidence were identified (see Table 9). Three pieces of evidence included: data from similar activities as included in this PC definition undertaken by Groundwork<sup>13</sup> in partnership with UUW, operational data from similar activities by another water company, and data from another water company which identified water efficiency savings by business type.
- 3.3.5 Using the first step of the framework, the eight pieces of evidence were given a high level review to determine whether or not they passed a minimum threshold for inclusion and a further, more detailed, assessment. This review was based on the characteristics of the evidence, such as the type, age, and relevancy of the evidence, and did not take into account any of the specific findings from the research. All eight pieces of evidence passed the minimum threshold and were taken forward to the next step of triangulation

### Consolidate research

- 3.3.6 The eight pieces of evidence which included data about the savings from water efficiency devices and actions were considered complementary, each relevant for separate aspects of individual activities planned within the scope of the performance commitment activities.
- 3.3.7 Following the framework however, the evidence were found to be independent of each other and did not overlap, therefore no consolidation of evidence was required.

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<sup>13</sup> Groundwork is a federation of charities mobilising practical community action on poverty and the environment across the UK. Groundwork London and South of England have been delivering water saving visits to businesses and public footfall buildings since 2017 on behalf of Thames Water. Groundwork Greater Manchester took learning from Groundwork London and South of England and delivered 63 water efficiency visits to schools in the North West of England on behalf of United Utilities. Groundwork Greater Manchester reported all interventions carried out and associated savings to United Utilities.

**Table 9: Identifying potentially relevant evidence**

Evidence	Study population	Relevance	Time period	Type	Summary	Include/exclude, and justification
Groundwork: Summary of schools water efficiency visits	Schools in Manchester and Sefton	Water saving in schools	2022-2023	Quantitative internal data	Provides information of the typical number and types of leaks found and fixed, the associated water savings, and the average suite of water efficiency devices fitted and associated savings.	Include. Recent. Quantitative. Relevant
Thames Water: Proposal for PR24 water efficiency performance commitment	England	Water efficiency performance commitment for household and non-household	Jun-22	Quantitative. Water company PR24 proposal	P20 / Appendix B: table of business categories and relevant water efficiency devices and associated litres/day savings	Include. Recent. Quantitative. Relevant
Thames Water: PR24 Smart Metering and Water Efficiency Q&A all-company open call	Non-household customers in Thames region	Smarter Business visits - average water savings	2016-2022	Quantitative. Water sector data	Average volume of water saved per intervention type (l/day)	Include. Recent. Quantitative. Relevant
Ofwat common performance commitment	UUW	ODI marginal benefit rates for Business Demand	2023	Ofwat Regulatory rates	ODI rates for <ul style="list-style-type: none"> <li>leakage</li> <li>PCC</li> <li>Business Demand</li> </ul>	Include. Recent. Quantitative. Relevant.
UUW Wholesale charges schedule 2023/24	UUW NHH customers	Wholesale charges for water and sewerage	FY 22-23	UUW Official statement of charges	Water (£/m <sup>3</sup> ) 1.814 Sewerage (£/m <sup>3</sup> ) 1.284	Include. Recent. Quantitative. Relevant
UUW bespoke PC research report August 2023	UUW HH and NHH customers	Evaluating and optimising the NHH bespoke PC proposal	Summer 2023	UUW customer research	Exploring, evaluating and optimising proposed bespoke performance commitments	Include. Recent. Qualitative. Relevant
Acceptability and Affordability testing phases 1 and 2	UUW NHH customers	Assessing affordability concerns amongst a range of customer groups, including non-households	Apr–Aug 2023	UUW Customer research		Recent. Quantitative. Relevant
MOSL, Non-household customer water efficiency survey results	English Non-household customers	Research into water shortages, water restrictions, better consumption data to be able to monitor, assess and reduce water consumption.	Jul-20	Non-household water sector research	RWG water efficiency sub-group was tasked by Ofwat and the EA with developing an Action Plan to deliver greater water efficiency in the non-household sector.	Recent. Quantitative. Relevant

## Weighting

- 3.3.8 The eight pieces of quantitative evidence were assessed in more detail for robustness and relevance, and scored between 1.7 and 6.0 overall (see Table 10).

**Table 10: Scoring results for each piece of evidence**

Evidence	Robustness score	Relevance score	Total score
Groundwork: Summary of schools water efficiency visits	1.5	1.5	3.0
Thames Water: Proposal for PR24 water efficiency performance commitment	1.5	1.5	3.0
Thames Water: PR24 Smart Metering and Water Efficiency Q&A all-company open call	1.5	1.5	3.0
Ofwat common performance commitment	1.9	2.5	4.4
UUW Wholesale charges schedule 2023/24	3.0	3.0	6.0
UUW bespoke PC research report August 2023	3.0	1.0	4.0
Acceptability and Affordability testing phases 1 and 2	2.6	0.3	3.0
MOSL, non-household customer water efficiency survey results	1.4	0.3	1.7

- 3.3.9 At this stage the final three pieces of evidence shown in Table 10 were excluded. All three of these pieces were of a good quality, but did not provide quantitative valuation data of sufficiently high relevance to the bespoke PC measure. They represented good additional evidence as to the relative priority that customers place on the issues of affordability and water efficiency for non-household customers, but did not enable the mapping of quantitative data to an incentive rate calculation. The two pieces of UUW customer research did not include a pound note (£) discussion of customer valuations.
- 3.3.10 The MOSL research included an extrapolation of maximum investment levels to achieve a theoretical 5 per cent water efficiency saving; however this was not based on customer valuation insight, but instead hypothesises maximum investment levels for a given efficiency rate and cost of water (neither of which align to the bespoke PC case). The anticipated savings achieved through the bespoke PC are substantially greater than the values used in this MOSL analysis, limiting its relevance.
- 3.3.11 The MOSL research also looked at monthly bill savings that would be needed to prompt customer action. This is not a valuation question, but instead a test of minimum value needed to prompt customer action. This could be used to inform take-up rates. However we had more direct and recent research into actual customer behaviour when offered water saving audits which we took forward in this triangulation process.
- 3.3.12 Given the quantity and scoring of the other pieces of research, we have been able to therefore exclude these final pieces of evidence from the triangulation process. The remaining five pieces of evidence were taken forward to the next step of triangulation.

## Mapping a financial incentive rate

- 3.3.13 The basis for the calculation of benefit of the performance commitment is the money that non-household customers could save on their water bill due to water efficiency measures.
- 3.3.14 Therefore the first step was to calculate the value of a unit of water saved. The 2023/24 UUW volumetric charge for standard non-household metered premises are given in the first row of Table 11 in £/m<sup>3</sup>. This was converted to an annual £ charge saved for using one litre less every day for a year by:

$$\frac{\text{Volumetric charge (£ per m}^3\text{)}}{1000} \times 365 = \text{£ per litre saved for 365 days}$$

**Table 11: Value to the customer of water saved**

	Units	Water	Sewage	Total
2023/24 volumetric charge for standard NHH metered premises	£/m <sup>3</sup>	1.81	1.28	3.10
Convert to £ per litre saved for 365 days	£/l/d	-	-	1.13
<b>Total value to the customer of saving a litre of water every day for a year</b>	<b>£/l/d</b>			<b>1.13</b>

- 3.3.15 The risk of overlap and double counting with common performance commitments was assessed, and it was determined that there was a risk of double-counting with the business demand and leakage performance commitments. To prevent duplication of incentivisation, the associated marginal benefit rates have been adjusted to remove incentives already covered by common PCs. In this submission, we have used the indicative rates published by Ofwat June 2023. We expect that these will be updated for final marginal benefit and ODI rates in final determinations.
- 3.3.16 Both the business demand and leakage performance commitments have an indicative rate of £0.52 per litre per day. To resolve any double count of financial incentive we have deducted the indicative marginal benefit value from the calculated value of water saved to the customer, resulting in a final rate of £0.61 per litre saved every day for a year (Table 12).

**Table 12: Resolving potential duplication with a common performance commitment**

	Units	Value
Total value to the customer of saving one litre every day for a year	£	1.13
Duplicate marginal benefit from relevant common PCs	£	0.52
<b>Total value to the customer of water saved less duplicate incentives</b>	<b>£</b>	<b>0.61</b>

- 3.3.17 The second step was to calculate the average water saving expected from a typical water efficiency audit. We created nine likely scenarios of take-up rates to estimate an average MI/d benefit.
- 3.3.18 We used the UUW and Thames trials data plus knowledge of the different types of non-household concessionary/schools customers in the North West (to the granular level of SIC codes) to calculate the number of anticipated audits for each category of non-household customer. From these trials we estimate that take-up rates may vary from 45 per cent (where there is good engagement with relevant trade bodies plus the bespoke PC is a unique selling point) to 5 per cent (where there is a lack of trade bodies and the UUW bespoke PC selling point is less popular than Thames' offering).
- 3.3.19 Table 13 gives two examples of how these various take-up rates across customer categories could result in varying audit visits and expected savings.

**Table 13: Demonstrating the difference in take-up rates between two of the nine scenarios**

	Schools	Sports clubs	Religious organisations	Other SIC codes	Number of audit visits	Expected savings (l/day)
Scenario 1	45%	25%	25%	25%	2,363	7,133,325
Scenario 8	35%	5%	15%	5 to 15%	1,506	5,064,225

- 3.3.20 The number of audit visits was multiplied by the average savings achieved by that type of organisation (informed by a mixture of the 'Groundwork: Summary of schools water efficiency visits' and the Thames Water evidence) to estimate an average water saving (l/day) benefit per audit (Table 14). Varying take-up rates produce different expected water savings per audit.

**Table 14: Evidenced savings per audit**

Scenario	Number of audit visits	Expected savings (l/day)	Average savings per audit (l/day)	£ value saving for customer (£/l/day)	£ saving value of one audit
Scenario 1	2,362	7,133,325	3,021	0.61	1,841
Scenario 2	2,189	6,827,875	3,119	0.61	1,901
Scenario 3	1,352	4,007,575	2,965	0.61	1,807
Scenario 4	2,020	6,251,500	3,095	0.61	1,886
Scenario 5	1,848	5,946,050	3,218	0.61	1,962
Scenario 6	1,010	3,125,750	3,095	0.61	1,886
Scenario 7	1,679	5,369,675	3,199	0.61	1,950
Scenario 8	1,506	5,064,225	3,363	0.61	2,050
Scenario 9	669	2,243,925	3,357	0.61	2,046
<b>Total</b>	<b>14,633</b>	<b>45,969,900</b>	<b>3,142</b>	<b>0.61</b>	<b>£1,915</b>

3.3.21 The average £ saving value of one audit was calculated by dividing the total expected savings by the total number of audits to produce an average litre saving per audit. This was multiplied by the £0.61 per litre per day to produce an average £ saving per audit of £1,915 (marginal benefit).

### Resolving conflicts

3.3.22 The objective of the conflict checking step in the framework is to identify, understand, and deal with any outliers, conflicts or counter-intuitive results in a consistent way. A sensitivity analysis was undertaken to test the robustness of the calculated marginal benefit rate using the nine scenarios.

3.3.23 The average £ saving value of one audit was recalculated first by excluding the minimum and maximum values (scenarios 3 and 8: Table 14), and secondly by excluding any valuations which fell outside of the interquartile range of £1,886 to £1,962, leaving five mid-range valuations.

3.3.24 The conflict checking step of the framework does not provide an opportunity to exclude results without any good reason. Comparing the results of the value produced using all scenarios (£1,915; Table 15) with the two values produced during the sensitivity analysis demonstrates that there is no bigger than a  $\pm 0.3$  per cent difference, an insignificant amount, and therefore there is no basis for excluding any scenarios from the triangulation.

**Table 15: Comparison of the different values produced through sensitivity analysis**

	£ saving value of one audit (£/l/day)	Difference from all scenarios
All scenarios	£1,915	-
No minimum and maximum	£1,910	-0.3%
Interquartile values only	£1,918	0.2%

### Results, evaluation and conclusions

3.3.25 As shown in Table 14 the value of an audit to the customer in year one, less any duplicate incentives, is £1,915 per audit. A benefit sharing factor was applied, with a 70 per cent share, producing a final proposed ODI rate of £1,340 (Table 16).

**Table 16: Calculation of the financial incentive**

	Units	Value
Value of audits to customer (year one) less duplicate incentives	£/audit	£1,915
Ofwat benefit sharing factor	Per cent	70
<b>Financial incentive</b>	<b>£/audit</b>	<b>£1,340</b>

## 4. Customer and stakeholder support for our bespoke performance commitments

### 4.1 The spread of customer research and initial research on customer priorities

- 4.1.1 We have used customer and community insights over time to co-create and iterate our plans and proposals for bespoke PCs. We collated potentially relevant customer insights and research already undertaken as part of our extensive customer research programme, alongside relevant operational data, data from other water companies or organisations, UUW investment programmes, and any partnership work of a similar nature that UUW has previously, or is currently, involved in.
- 4.1.2 Starting with our customer priorities research<sup>14</sup> in 2021, we have identified gaps between customer priorities and the common PCs, alongside what is important or different about the North West region as a whole. Our customer priorities research showed us that, beyond minimum service expectations, affordability and environmental priorities top the list and see a significant rise from PR19 customer priorities research. Tackling climate change, pollution and the carbon footprint were amongst these environmental priorities.
- 4.1.3 These priorities that rated highly were fed into the decision-making framework and when comparing to the list of potential common PCs which we considered at the time that Ofwat may propose, we highlighted a gap of affordability. This provided a starting point to develop bespoke PCs to address affordability (hence the development of a bespoke PC focused on aspects of non-household affordability). Similarly, action on the environment was highly rated, and the Ofwat / CCW customer preferences research also identified biodiversity as a gap. This further fed into priorities we may wish to address in bespoke PC proposals. The final report on this can be found on our website<sup>15</sup>:

### 4.2 Stakeholder engagement

- 4.2.1 We discussed our bespoke PC development and the customer research with YourVoice and amended our proposals and research to reflect their comments. For example we took on board their concerns about the potential difficulty of the administration of the non-household affordability bespoke PC and ensured that qualification for the activities in this bespoke PC would be offered only to those eligible for our existing schools and concessionary tariffs which we already administer and operate.
- 4.2.2 We engage with YourVoice regularly on our PR24 customer research programme and they are involved in designing and shaping the methodology of research, as well as reviewing and challenging the reporting and use of the results. For example, YourVoice members reviewed and challenged the research for our bespoke PC customer research results, attended the focus group sessions and were invited to hear the results in our research presentation session. This was a discursive forum where UUW and YourVoice asked questions on the research results and gained further insight and were able to make amendments to the report before it was finalised. This qualitative research concluded that customers were happy to support all of the bespoke PCs proposed, with embodied carbon seen as a priority. For more information on how YourVoice challenge our research please see supplementary document *UUW21 - Customer research methodology*.
- 4.2.3 We have also discussed our proposals with our partners on the Love Windermere board on a number of occasions, outlining the aims and activities of the bespoke PC, within the context of our regulatory business plan submission. We have received support from Love Windermere board members for the inclusion of this bespoke PC in our PR24 business plan.

<sup>14</sup> [unitedutilities.com/corporate/about-us/our-future-plans/listening-to-our-customers](https://unitedutilities.com/corporate/about-us/our-future-plans/listening-to-our-customers)

<sup>15</sup> [unitedutilities.com/globalassets/z\\_corporate-site/about-us-pdfs/p143-customer-priorities-2021/final-report.pdf](https://unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/p143-customer-priorities-2021/final-report.pdf)

## 5. Applying the framework to demonstrate the golden thread between our customer research and insights, and our wider business plan

- 5.1.1 *Chapter 3 – Customers and Communities Shape Our Business Plan* outlines the customer support for our AMP8 and long-term business plans and how insight has shaped and informed the content and decision making of the discretionary elements of our plan. In order to ensure there is a ‘golden thread’ of insight to action, UUW’s customer insight team has a variety of methods to track the use of insight within UUW and ensure it has meaningful impact on the plan. For more information on this, please see supplementary document *UUW21 - Customer research methodology*.
- 5.1.2 We have also used our triangulation framework, which aligns with triangulation best practice, to select and apply weightings of evidence to the key sources of research for our business plan. The description of the framework can be found in section 2.2.
- 5.1.3 The framework was adapted for this purpose in two ways:
- (a) The ‘mapping’ and ‘level and range criteria’ were removed as these were only applicable to the bespoke performance commitments ODI rates triangulation
  - (b) More detailed criteria was added to the sampling scoring criteria for qualitative research to ensure this has an adequate weighting on the business plan.
    - (i) Qualitative data sources score a zero if samples that aim to be representative are >30 participants and sub groups are >8
    - (ii) Qualitative data sources score a 2.5 if samples that aim to be representative are <30 participants and sub groups are <8
    - (iii) No qualitative research can score a 3, only quantitative research can do so.
- 5.1.4 Steps taken to triangulate customer insight to inform the business plan:
- (a) Along the way, each UUW commissioned customer research project and relevant external projects have been scored according to the framework triangulation criteria. In total 135 pieces of research have been scored according to the criteria below on robustness and relevance. The framework takes into account methodology, sampling robustness, evaluation, cognitive validity and customer base and context.
  - (b) Pieces of evidence that are not independent of each other were consolidated, for example, recurring surveys like ‘State of the Nation’ and brand tracking. Where values are used from these projects, these were consolidated into a simple weighted average.
  - (c) All projects could not score above 15 for the total of all categories and therefore, sources scoring more than 10 out of 15 were deemed robust and relevant enough to become a key source of research and insight for business planning.
  - (d) Once these key sources were identified, they were mapped to relevant areas of the business plan. Research that was more relevant to the subject matter, was used more directly. Categories included:
    - (i) Long-term plans: e.g. WRMP, DWMP, Long-term delivery strategy
    - (ii) AMP 8 plans:
      - Total plan affordability
      - Total plan acceptability
      - WINEP statutory elements



- Carbon
  - Statutory environmental improvements
  - Bioresources
  - Discretionary enhancement spend
- (e) For valuations, each quantitative score from the relevant key sources is considered. Areas for triangulation of valuations were selected based on whether they had direct relevance to business plan and strategy areas. Using the weighting score calculation from our triangulation framework, we have:
- (i) Calculated the average score for each area by averaging the scores for the robustness criteria (Table 17) and the scores for the relevance criteria separately.
  - (ii) Assigned an overall score for each piece of evidence by summing the two area scores.
  - (iii) Assigned weightings to each piece of research for inclusion based on the overall score
- (f) Using this weighting, a weighted average of each score is calculated to determine the final valuation used. In this way, the valuations and evidence to be examined to input into the plan are free from bias and follow a transparent framework to work to.

**Table 17: Scoring criteria**

Area	Criteria	Questions	Criteria Score (0–3)	Average Area Score	Total score
Robustness	Methodology	What approach was used?			
	Sampling	How large is the sample size / data set?			
	Evaluation	How was the study evaluated?			
	Cognitive validity	How did the study designers or data analysers factor in cognitive validity?			
	Customer base and context	How relevant is the customer base and wider context for UUW's customers?			

Source: Adapted from the PR24 Triangulation and mapping framework

- 5.1.5 Our external assurer, Turner & Townsend, has reviewed the guidance on high quality research and impact as outlined in Ofwat's Final Methodology and Ofwat / CCW customer engagement positioning paper, and has reviewed several projects to ensure the UUW research programme is high quality and has been conducted according to best practice. The scope of this work included a:
- (a) Review of how key sources are selected and triangulated;
  - (b) Review of key strategic projects against the high quality methodology; and,
  - (c) Review of key strategic projects in terms of their usefulness and impact and how this has been used to shape the business plan.
- 5.1.6 For more information on our assurance approach and the conclusions from this, please see *Chapter 10 – Assurance and track record*. We have also provided a document displaying our scoring and triangulation approach, please see supplementary document *UUW34 – Customer Research Golden Thread Evidence*.



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