



The voice for water consumers
Llais defnyddwyr dŵr

TRIANGULATION- A REVIEW OF ITS USE AT PR19 AND GOOD PRACTICE

FINAL REPORT APRIL 2021

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CONTENTS

- 1. Executive Summary 3
- 2. Introduction 6
- 4. Review of triangulation approaches in PR19 11
- 5. Opportunities to better evidence good practice 21
- 6. Recommendations for an updated framework and principles. 23
- 7. Conclusions 31
- 8. Annex 1: Methodology 32

1. Executive Summary

The Consumer Council for Water (CCW) commissioned this study to review the use of triangulation methods by water companies during the 2019 Price Review and to identify good practice across the sector. The review has explored the barriers and enablers that helped determine how successful companies' approaches to triangulation at PR19 were and has based recommendations for how a minimum level of good practice in this space could be achieved by the sector whilst still allowing companies to innovate beyond this.

Companies made use of the 2017 ICF/CCW report¹ to benchmark their triangulation processes. However, they found the relatively high level and academic nature of the guidance in this document failed to provide clear guidance on what companies should be doing to achieve good practice.

There was a significant range in both the approach and practical demonstration of triangulation in PR19. Most documentation focuses on valuation triangulation although companies have also undertaken triangulation to inform the wider development of their business plans. Several companies are also relatively advanced in terms of their planning for PR24 and are moving to an ongoing approach to triangulation to understand their customers evolving priorities.

Enablers of good practice in PR19

Based on the review of documentation provided for this study, we have identified the following as enablers of minimum good practice for triangulation. These have been mapped against specific stages of the engagement and triangulation process.

A strategic approach to collecting customer evidence

- 1) **Undertaking a phased and iterative approach.** By phasing engagement and insight, companies can better refine and build their business plans in parallel with engagement insight. It is important that companies clearly lay out the objectives and questions they ask at each phase. Iteration of triangulation over time also allows for better understanding and tracking of customer needs.
- 2) **Developing a consistent and transparent decision framework.** This is a critical enabler to demonstrate both transparency and how insight is used. The decision framework should also set out the purpose for engagement activity and support an iterative approach.
- 3) **Putting in place assurance of the process.** Several companies appear to have put in place mature challenge and assurance of the end-to-end process. In addition to making use of challenge groups or CCGs for this purpose, companies also assured their approaches through the use of third-party independent assurance.
- 4) **Linking Business as Usual (BAU) insight to strategic goals.** The ability to convert the rich source of BAU insight that companies collect (e.g., customer contacts) has been used by some companies as the base upon which they have built their engagement process.

Collecting, collating, and synthesising customer evidence

- 1) **A centralised process within the company** for the capture and storage and synthesis of engagement data. Some companies increased internal buy-in to this process by allowing anyone in the company to view the database.
- 2) **Capturing relevant granular metadata for insight.** Relevant metadata for insight would include details such as customer segmentation, insight themes and source. This serves three broad purposes. Firstly, it allows clear transparency about deciding which data to use in the process, secondly, it enables easier weighting, and thirdly it allows the database to be interrogable for instance based on customer segments to generate insight into how needs and views vary across a customer base.

Weighting and combining customer evidence

- 1) **Transparent approach.** The rationale for the use, and result of, weighting approaches needs to be transparent. For example, the use of expert judgement can be valid but if this process is

¹ ICF/CCW: Defining and applying triangulation in the water sector 2017

not documented including the weightings derived and the impact of these then it prevents a clear line of sight between customer views and business decisions.

- 2) **Use of a standard approach.** Companies that made use of standardised approaches show a greater degree of transparency and robustness in their process. E.g., Treasury's Magenta book.
- 3) **A clear approach to demonstrating balanced decisions.** When customer evidence shows differing opinions, triangulation needs to set out a clear and transparent approach for balancing these. Balanced decisions should be documented and evidenced to provide visibility.
- 4) **Defined decision-making framework.** To show the consequence of weighting and combining data sources, which then feeds into the business plan, or whether insight needs revisiting.

Validating outputs

- 1) **Using multi-factor validation.** A few companies have used at least three levels of validation for findings, typically consisting of an internal challenge, an external challenge with expert customer groups or challenge group (e.g., CCG), and a final independent review.
- 2) **Running sensitivity and scenario testing.** Some companies refer to the use of these tools to provide a view on the impact of findings upon investment plans. For instance, the use of Multi-Criteria Assessment (MCA) tools to compare the impact of different investment and policy decisions resulting from triangulation.
- 3) **Making research findings publicly available.** There is a range in the extent to which companies have shared their findings with the public. But doing so helps to build transparency into this stage. Best practice would be to make original research reports publicly available.
- 4) **Independent review of the triangulation process.** Given the element of judgement involved in the process as well as the potential for bias, the use of an independent review of the process, provided assurance of the validity of the outcomes. Companies have made use of academia or consultancy support to carry out this activity.

Incorporating validated findings into decisions

The key enabler at this stage is the use of **a robust and transparent decision framework**. This links back to the first step of the process where companies need to ensure that their engagement has been set up and applied with a clear purpose i.e., inclusion in business plan, service measures. For example, the ability to show how specific engagement or insight was used within triangulation and the specific components of business planning impacted by this.

Recommendations to enable good practice triangulation for PR24

We have proposed the following criteria for what good triangulation should look like. These have been designed to sit below the high-level principles described in the 2017 document and aim to act as a minimum benchmark for companies whilst avoiding prescribing specific methods. Companies should be able to innovate further beyond these.



Engagement should be an ongoing process. Designed to show how customer opinion has evolved over time and how this impacts decisions. A designed approach will consist of specific phases for triangulation with prescribed outcomes and research questions at each stage.



Triangulation should make use of a wide range of inputs and these should not be solely engagement insight. The quality and breadth of data used to drive triangulation help to determine the robustness and transparency of the process.



Balanced decisions should be at the core of triangulation. Where information is gathered to identify new research areas or where feedback agrees, triangulation plays a limited role. The triangulation process starts by identifying the conflicting points within the body of evidence where balances between values and opinions need to be made and transparently showing the resulting decisions.



Validation of findings should make use of a wide range of datasets. Validation findings are made more robust and transparent through comparison with a range of quantitative and qualitative data. Comparison with findings from other sectors further lends robustness to outputs.



Triangulation should be informed by a transparent and consistent weighting framework. A transparent and consistent process to the weighting of disparate insight streams provides a robust process and enables transparency.



Companies should seek independent assurance of their process and outcomes. This should cover assurance of the whole triangulation process. It should also assure and review the outcomes generated.

2. Introduction

The Consumer Council for Water (CCW) commissioned Sia Partners to review the use of triangulation methods by water companies during the 2019 Price Review and to identify good practice across the sector. This section presents the background to the study and its objectives. It provides a description of the methodology for this study and sets out the structure of this report.

Background

Water companies need to ensure that their business plans are aligned with their customer's needs, preferences, and expectations. Following the publication of business plans for PR14, CCW, and Ofwat found that companies were over-reliant on single sources of customer evidence upon which to derive the outcomes and performance commitments of these plans.

To address this, in 2017 Ofwat set out its expectations for how companies should triangulate their business plans with insight and data gathered from their customers. This guidance required companies to assess multiple sources of customer insight to provide a more calibrated and evidence-based approach to developing outcomes and performance commitments that more closely matched customer preferences.

This 2017 guidance was not explicit about the specific methodology companies should use to undertake this triangulation process. To address this risk CCW commissioned work to review best practice approaches and methodologies for triangulation and to inform companies approaches for PR19. The outcomes of this review included a set of principles and a framework to govern companies' engagement plans for PR19.

In practice, individual companies took different approaches to undertake triangulation activity for PR19, with some companies developing high performing triangulation approaches and plans whilst a few companies developed poorer performing triangulation approaches.

Triangulation remains a critical element to ensure the best outcomes from business planning for customers. Ofwat's determination process must also be based on concrete evidence of customer views. Effective triangulation methodologies allow companies to effectively assess customer views and enable multiple sources of customer insight to be incorporated in assessments.

Given the variance in approaches to triangulation in PR19, best practice is likely to have improved since CCW's 2017 review. Companies should also have further insight as to barriers and enablers for developing and applying triangulation methodology. This review identifies the current level of best practice to support the sector as a whole to enhance current triangulation efforts.

Study Objectives

This study has set out to review the use of triangulation methods by water companies during the 2019 Price Review to identify good practice. The main aim of this study is to enable better approaches to triangulation in PR24 by identifying recommendations and improvements to the 2017 framework-based approaches taken in PR19.

CCW also set a series of specific research objectives for this study to answer which are detailed in the table below:

Research question	Details
How different companies used triangulation at PR19 to arrive at their business planning decisions.	As well as identifying good practice from those companies who used triangulation successfully it is important to understand why other companies struggled and what can be done to help them in future.
Whether triangulation should be used for all aspects of business planning, or only for specific elements (i.e., PCs & ODIs).	Ofwat is currently reviewing its approach to customer engagement for PR24. It is likely that some aspects of research may be centralised rather than left to individual companies. The review will need to consider how this would affect how companies use/weight the data they triangulate.
Whether, and if so what, elements of good practice should be adopted by the industry as a whole.	CCW, Ofwat and the CCGs highly rated a number of the triangulation practices utilised by companies. The review should identify whether any practices should be recommended for the industry to standardise.
Ongoing triangulation – how companies can put in place frameworks now to capture their BAU and community engagement as part of a rolling cycle of engagement.	CCWs <i>Framework for water company research</i> ² recommends that companies make greater use of localised community engagement on specific schemes and that engagement becomes more of a rolling programme rather than the current model that sees an explosion of work around the business planning cycle.
An update to the ICF/CCW principles and framework to create a new good practice triangulation framework ahead of PR24.	Although some form of triangulation had been used in the sector before, PR19 was the first time that this became a specific requirement for companies within Ofwat's price review methodology. There have been significant improvements in the way companies have used the practice since the 2017 ICF report. These improvements will need to be captured and considered as part of an overhaul of the existing principles and the triangulation framework. As part of the review, it would be useful to understand from companies the extent to which they utilised the ICF paper – and the reasons why they did, or did not, consider it to be useful
If there are any innovations in triangulation from other sectors that could be used in the water sector.	

3. Triangulation experience in other sectors

This study explored other sectors for examples of triangulation practice, there are limited explicit examples of triangulation practice in other sectors. However, the energy sector has the most comparable examples of triangulation, and this section outlines examples of triangulation practice in this sector.

Research questions addressed in this section

- 1) If there are any innovations in triangulation from other sectors that could be used in the water sector.

Summary

Triangulation of customer engagement is now an important theme within both the water and energy sectors. However, there is still a lack of formal definition and guidance as to what best practice looks like in this space. Partly this reflects the relatively unique regulatory spaces these sectors operate in. It can also be difficult to determine the practical application of companies' triangulation process which can be a barrier to proving best practice.

Defining triangulation

The 2017 ICF/CCW report defines triangulation as the use of 'multiple and independent measures to examine a hypothesis or conclusion being investigated, with the intent of using multiple perspectives to minimise bias and maximise validity.'

As an activity triangulation refers to the synthesis, weighting, and combination of disparate data sources to provide a single indicative value reflecting the customer view. Triangulation is typically used to provide valuation figures, as well as a broader application to determine business planning and service performance levels.

Increasingly the focus from regulators, both in the water and energy sectors, is that the use of triangulation shifts from its historic application for validation and valuation, to using triangulation to enable a greater understanding of a company's customers. To focus on understanding the range of customers' views through segmentation to allow new insights to be developed, for instance, based on geography or over time.

Overall approaches to customer and stakeholder engagement do have a few best practice approaches as follows:

Guidance	Key conclusions
Citizen's advice- Strengthening the voice of the customer in energy networks' business planning³	<ul style="list-style-type: none"> • The range of topics that consumers are engaged on needs to widen to reflect the amount and complexity of change in the energy system. • To tackle some of these more complex, technical issues, companies should consider using deliberative methods. • Companies can help the regulator and challenge groups by highlighting where trade-offs exist, where disagreement lies, and why certain solutions were chosen over others.
AccountAbility A100 Stakeholder Engagement Standard (2015)⁴	<ul style="list-style-type: none"> • Inclusivity - people should have a say in the decisions that impact on them. • Materiality - decision makers should identify and be clear about the issues that matter. • Responsiveness - organisations should act transparently on material issues.

³ Citizen's advice, 2018 - Strengthening the voice of the customer in energy networks' business planning³

⁴ AccountAbility, 2015- A100 Stakeholder Engagement Standard (2015)

However, there is no definitive view of what good practice is for triangulation specifically, the engagement practices outlined above make no explicit reference to triangulation good practice or how it should be carried out.

Triangulation in the Energy Sector

Given the very similar customer relationship and regulatory oversight in the energy sector as in the water sector, some relevant practices could be applied to the water space.

Energy is arguably more advanced in 'qualitative' triangulation, through a focus on stakeholder engagement and consumer vulnerability (SECV), as opposed to the use of triangulation for the specific purpose of deriving valuation figures.

The extent of engagement in the energy sector is significant, with companies engaging tens of thousands of stakeholders. The management of this feedback had been a historical weak point, with limited links demonstrated between engagement, feedback, and action (the golden thread). While the SECV process drove small, annual improvements, RIIO-2 led to a significant focus on this weak point - with clear improvement, and companies starting to get more value from engagement.

Leaders in the space (including Cadent in Gas, and Western Power Distribution (WPD) in Electricity) have put in place formal structures and processes that lead to well-organised bodies of feedback that inform business planning processes and carry on into BAU after the plan is submitted.

Clear examples of this include Cadent's decision-making framework and WPD's business planning consultations, which demonstrate clear grounding in feedback for each output (despite only being at draft stage). District Network Operators are currently leading with more technology-enabled approaches to triangulation:

- There are examples of well justified weighting methodologies, built and validated with Customer Engagement Groups, that include a wide range of indicators including the stakeholder's knowledge, impact, and influence, the quality of the engagement, and the scale of agreement behind the finding.
- There are examples of well-structured databases consisting of hundreds of thousands of quantitative and qualitative customer insight. Companies have developed systems to allow these to be filtered to show the specific opinion of one customer segment over another, or in one region on a specific topic. This allows clarity and transparency around trade-off decisions between customer segments.
- And there are examples of wider sentiment analysis being used to guide objective setting (e.g., using BAU customer contact data) - conducting want and need and polarity analysis to identify topics where further qualitative or quantitative research is necessary.

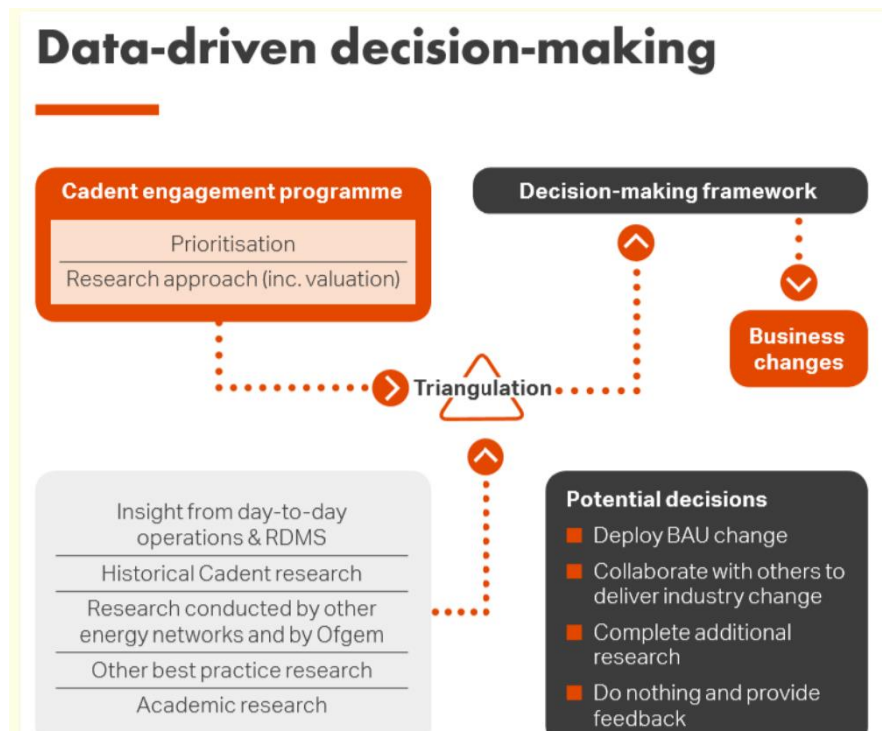
All the above has informed our review, and our recommendations in section 6.

Examples of good practice in the energy sector

Cadent: Relational Database Management System (RDMS)

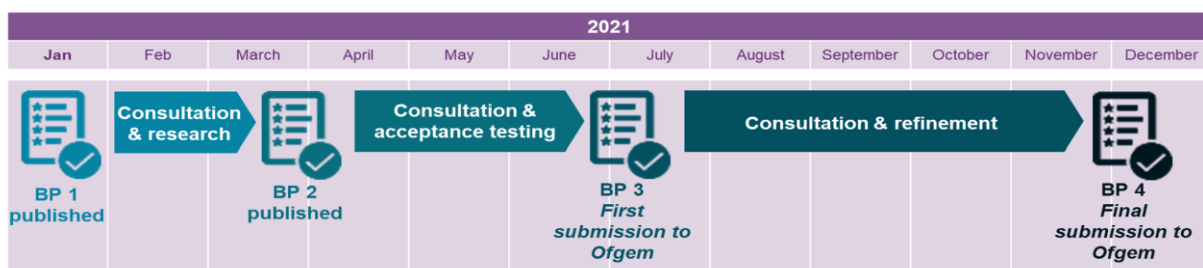
Cadent's RDMS uses artificial intelligence to recognise themes across millions of data points using their stakeholder feedback and customer sentiment capture. This insight is readily available throughout the business and can also be triangulated with additional data where required. All this insight feeds directly into their decision-making framework leading to business changes, collaboration, or research.

Cadent built the following triangulation approach to take advantage of the insights that were generated from the data-driven review of current and historical insights.



Western Power Distribution (WPD): Approach to business planning and consultation

WPD are taking a multiphase approach to developing their business plan, with four versions developed, published, and consulted on during 2021. Ahead of publishing the first version of the business plan in January 2021, the company took a 'blank sheet of paper' approach and have developed all their commitments based on stakeholder feedback.



4. Review of triangulation approaches in PR19

This section sets out the findings relating to how water companies approached triangulation in PR19. It describes approaches, barriers to good practice, and case study examples of best practice as mapped against the end-to-end triangulation process.

Research questions addressed in this section

- 1) How different companies used triangulation at PR19 to arrive at their business planning decisions.
- 2) Whether, and if so what, elements of good practice should be adopted by the industry.

Summary

Assessing the quality of triangulation approaches and how the outcomes have been applied is a difficult process. This is further made challenging by the current lack of consensus across the water sector as to what best practice approaches look like. We have based this review on the documentation and questionnaire feedback we received and have broken this down across the steps taken to undertake triangulation, including a pre-step around setting strategic objectives for engagement.

When reviewing triangulation approaches in PR19, it is important to distinguish between:

1. Informing business plans through the assessment of different sources of qualitative and quantitative evidence
2. Valuation triangulation, which validates and cross-checks quantitative valuation studies for use in specific components of investment planning.

In the first case, companies make use of a wide range of qualitative and quantitative data to guide business plan development. Leading companies undertook this on an iterative basis using the breadth of insight to link their understanding of customer needs to the business plan outcomes.

Valuation triangulation was applied on a more specific basis and primarily made use of quantitative Willingness to Pay data to derive specific triangulated values. Most companies used these values to inform performance commitment reward and penalty values. Leading companies undertook several iterations of these values as business plans developed.

Most companies undertook a validation of these triangulated values through comparison with qualitative and other quantitative insight. Where this was in agreement, this led to further confidence in the values. When differences were found companies would review further to understand what was driving the differences.

There is significant variance within the sector in the maturity of approaches taken, with some companies using limited data sets or providing relatively little specific evidence of triangulation approaches, whilst leading companies have well-developed and robust processes.

We have highlighted in this section the barriers to good practice as future guidance needs to ensure these are addressed, and our recommendations in the next section set out how this could be done. Given the variance in performance, leading companies' processes already meet most of these criteria, and we anticipate the biggest benefit being to aid companies who struggled with the process in PR19.

Key challenges at PR19

Timing and depth of guidance available for companies

Companies have been relatively consistent in their comments about how both the timing, and the relatively high-level nature of guidance in this topic hindered their approaches to triangulation. In some cases, companies had already embarked on extensive engagement programs. And for others, the concept of triangulation was relatively new and required committing of resources and time. This was compounded by a lack of clarity about how triangulation processes and their outcomes would be assessed by the regulator.

Approaches to contradictory data not clear

Contradictory data, for instance, data that shows unexpected customer preferences, should be an integral part of a good triangulation process. It shows that a true range of customer segments and opinions has been included in the process. A transparent approach to demonstrating how companies have responded to such findings enables a better line of sight from customer insight through to business plan. Nevertheless, there is relatively little evidence for how companies approached this situation in practice and remains a challenge.

Inconsistent processes for incorporating BAU data into the approach

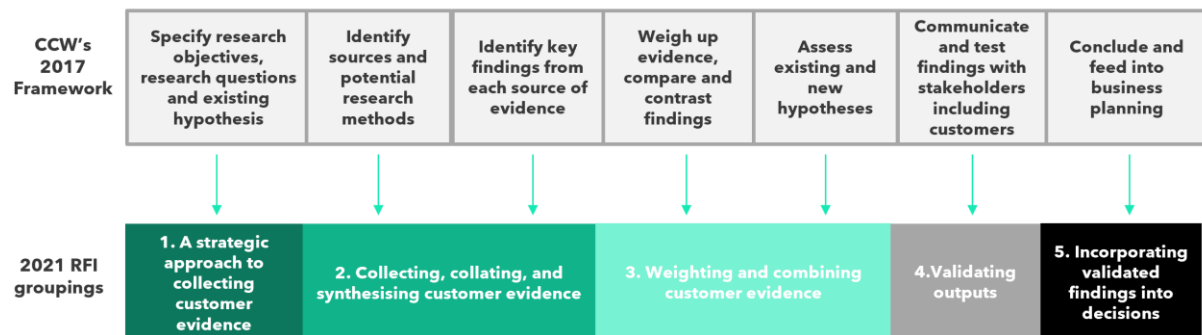
Owat, CCW, Ofgem, and bodies such as Sustainability First and Citizens Advice are advocating that BAU data (e.g., customer contacts) becomes incorporated into this triangulation process. Doing so not only adds a rich seam of data, but it can also aid the transparency of the process, as well as reducing the extent to which companies must restart their engagement programmes each cycle. It is also an issue for smaller companies who may have barriers around putting in place the necessary data architecture required to capture and categorise such data in a way that it can then inform strategic decision making.

Varying states of engagement team capabilities

One cause of the variation in approaches appears to be the relevant internal engagement capabilities and maturity of companies' research and engagement activities. For instance, those who already had extensive data sets, and an informed understanding of triangulation appear to have addressed the need for triangulation better than those with small less experienced teams and a lower understanding of the objectives and needs for triangulation.

A review of triangulation approaches in PR19

The rest of this section details our findings as mapped against the high-level steps used in the RFI, the diagram below shows how this corresponds to the 2017 ICF/CCW Framework. We have focused on identifying the barriers and enablers of good practice at each stage of the process.



1. A strategic approach to collecting customer evidence

Summary

The 2017 ICF/CCW report highlighted the setting of strategic objectives for customer engagement as a key pre-step in terms of having a good approach to triangulation. Companies that performed better overall took time to set in place strategic approaches to their engagement and triangulation processes. For instance, reviewing possible triangulation methodologies and working closely with their challenge groups/CCGs to define this.

Barriers to good practice

To better understand barriers to good practice and their root causes, we have broken them down into two categories:

- 1) External: factors that are outside the direct control/ownership of a company e.g., regulatory guidance
- 2) Internal: factors that are directly owned by a company e.g., data collection approaches

External factors	<ul style="list-style-type: none">• The timing and high-level nature of regulatory guidance prevented companies from establishing what good looked like and applying it• Clarity around how triangulation would be assessed and measured by the regulator• Lack of distinction in guidance between valuation triangulation and business plan triangulation• Limited sector collaboration to share practices
Internal factors	<ul style="list-style-type: none">• Reactive approaches to triangulation led by business plan timelines• Limited use of independent review/assurance of the triangulation process and outcomes (e.g., use of academia)• Not making use of existing research e.g., previous business plans or sector guidance. Several companies started from scratch in PR19, which drove time and resource constraints• Lack of principles around assessing the quality of data feeding into the process as well as the outputs.

Enablers of good practice

The approach taken in this stage is a key determiner in whether the overall approach to engagement and triangulation will deliver successful outcomes, both in terms of robust insight, as well as meeting success criteria such as demonstrating a golden thread of customer insight.

Key enablers of good practice at this stage are:

- 1) **Undertaking a phased and iterative approach.** By phasing engagement and insight, companies can better refine and build their business plans in parallel with engagement insight. It is important that companies clearly lay out the objectives and questions they ask at each phase. Iteration of triangulation over time also allows for better understanding and tracking of customer needs.
- 2) **Developing a consistent and transparent decision framework.** This is a critical enabler to demonstrate both transparency and how insight is used. The decision framework should also set out the purpose for engagement activity and support an iterative approach. For example, the iterative approach to business plan development undertaken by WPD.
- 3) **Putting in place assurance of the process.** Several companies appear to have put in place mature challenge and assurance of the end-to-end process. In addition to making use of challenge groups or CCGs for this purpose, companies also assured their approaches through the use of experienced customer groups and third-party independent assurance.
- 4) **Linking BAU insight to strategic goals.** The ability to convert the rich source of BAU insight that companies collect (e.g., customer contacts) has been used by some companies as the base upon which they have built their engagement process.

Examples of good practice

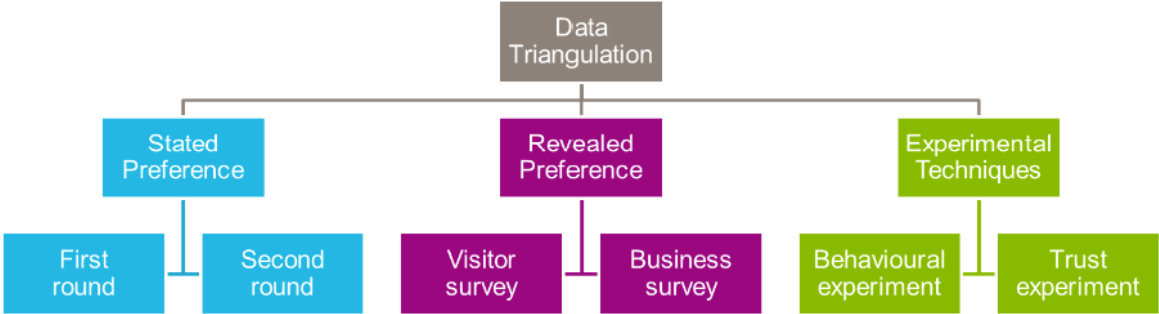
Anglian Water: Incorporating BAU data into the process

Anglian water mapped each source of evidence including BAU data against service measures and outcomes, they also looked at each specific service measure and identified where information would be useful, determined if there was sufficient range of existing information and highlighted any gaps.

They collated relevant studies, research, and customer insight, through a Synthesis report, written by an independent author, and updated on a monthly basis as further engagement was added to the evidence base. This included BAU data from customer complaints and enquiries, and call centre data.

Yorkshire Water: a multifactor approach to obtaining quantitative valuation insight

Yorkshire Water set out a very clear approach to valuation triangulation defining six specific work packages, clear objectives for each, and ensuring a range of approaches were fed into the triangulation process.



Recommendations for good practice

- **Engagement should be an ongoing process.** Designed to show how customer opinion has evolved over time and how this impacts decisions. A designed approach will consist of specific phases for triangulation with prescribed outcomes and research questions at each stage.

2. Collecting, collating, and synthesising customer evidence

Summary

This phase covers the activities related to the capture, storage, and synthesis of insight sources, before weighting and combination. Most companies took a centralised approach to collating their insight, using database or spreadsheet-based approaches to recording and categorising data. Companies also recorded metadata that could allow segmentation of customers (e.g., demographics, location).

Barriers to good practice

Internal factors	<ul style="list-style-type: none">• Lack of breadth and depth of data collection e.g., not making use of historic or sector-wide data• No review or assurance of data• Limited segmentation and review of a range of customer or stakeholder views• No transparent decision framework/criteria for whether insight gathered is suitable for triangulation/informing the business plan• No phased approach to reviewing gaps and undertaking research to meet these.
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Enablers of good practice

The ability to synthesise disparate sources of insight into a common framework is a key success criterion to enable the weighting and combination of sources into a single figure.

Key enablers of good practice at this stage are:

- 1) **A centralised process within the company** for the capture and storage and synthesis of engagement data. Some companies increased internal buy-in to this process by allowing anyone in the company to view the database.
- 2) **Capturing relevant granular metadata for insight.** This serves three broad purposes. Firstly, it allows clear transparency about deciding which data to use in the process, secondly, it enables easier weighting and thirdly it allows the database to be interrogable for instance based on customer segments to generate insight into how needs and views vary across a customer base.

Examples of good practice

Severn Trent - Customer segmentation.

Severn Trent applied a new customer segmentation model which incorporated customers' attitudes and behaviours in addition to socio-demographic data. This enabled better alignment of their stakeholder engagement activity with specific stakeholder preferences. They phase their engagement approach to initially focus on understanding their customers on a wider context than just water, as well as focusing on hard-to-reach customer segments.

Recommendations for good practice

- **Triangulation should make use of a wide range of inputs and these should not be solely engagement insight.** The quality and breadth of data used to drive triangulation help to determine the robustness and transparency of the process.

3. Weighting and combining customer evidence into preferences and values

Summary

This part of the process concerns the activities relating to weighting and combining data sources into a single value for use in planning. We have seen a significant variance in approaches taken by companies and the degree of evidence/data provided to support these.

Weighting of sources

Weighting should not be seen as an ‘algorithm’ to define a single course of action automatically. It is simply a structured process to provide the necessary context for decision-makers to make a fully informed decision. This may by necessity involve a degree of judgement when assessing sources, however where judgement is applied this should be in a transparent and consistent approach.

There was a variety of approaches to weighting insight sources applied in PR19, with varying degrees of transparency. Examples of weighting approaches used in PR19 are described below:

- 1) **Expert judgement:** Several companies made use of expert judgement when assessing what weightings to provide sources. Whilst this approach has the benefit of being more adaptable, if it is to be used, companies should ensure that the process is transparent. There is risk of bias being introduced into this process due to the level of subjectivity.
- 2) **UKWIR 2016 Methodology** (Setting performance commitments and incentives to deliver best value for money, ⁵): This approach uses a multi-criteria decision analysis to compare values based on factors such as statistical validity, cognitive validity, track record, relationship with qualitative evidence, and completeness. A view is then taken of the pros and cons of each method and a recommended value was selected. This method requires that companies capture metadata associated with research and insight to allow categorisation.
- 3) **Treasury’s Magenta Book**- Central Government guidance on evaluation⁶ : Sets out a rigorous and consistent approach for how data can be assessed to arrive at a numeric weighting. The weighting is based on an assessment of the robustness and relevance of contributing data to the specific research question being asked. Using this approach allows for a high level of consistency and robustness in the development of insight weightings. This method also requires that companies capture metadata associated with research and insight to allow categorisation.

A key application of triangulation is to determine how companies make balanced decisions, i.e., when there are varying opinions or valuations for a service measure. The use of conflicting evidence is also a strong indicator of the strength of companies’ triangulation approaches. We have only found a few explicit examples where companies detail their process for managing conflicting evidence and there is limited practical evidence to support this.

Finally, we have found limited evidence of comprehensive approaches to reduce bias in weightings, this may be down to the limited practicable examples we were provided with for this study. This is particularly relevant due to the primary use of triangulation for quantitative insight leading to a risk of bias based on valuations without the inclusion of qualitative triangulation.

Barriers to good practice

Internal factors	<ul style="list-style-type: none">• Lack of breadth and depth of data collection e.g., not making use of historic or sector-wide data• No transparency on weightings used and how these were derived• Lack of clarity from regulators on approaches to weighting
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⁵ UKWIR (2016) UKWIR: Setting performance commitments and incentives to deliver best value for money, UKWIR Report Ref No 16/RG/07/39

⁶ HM Treasury (2020) Magenta Book Central Government guidance on evaluation.

- Combining disparate data sets
- Limited scale and scope of WTP data collected
- No use of conflicting or outlying data as part of the process

Enablers of good practice

The previous two steps in the process are strong determinators for how well companies have managed to combine and weight sources. Those with a strong strategic approach, that is iterative in combination with a data synthesis process that allows for consistent and transparent weighting of sources have a strong process than those where these steps were not followed fully.

- 1) **Transparent approach.** Whilst it is important that companies are not prescribed in their approaches and are free to use different weighting mechanisms, the use, and result of these needs to be transparent. For example, the use of expert judgement can be valid but if this process is not documented transparently, it raises issues around demonstrating lack of bias and allowing line of sight.
- 2) **Use of a standard approach.** Companies who made use of standardised approaches show a greater degree of transparency and robustness in their process. E.g., Treasury's Magenta book.
- 3) **A clear approach to demonstrating balanced decisions.** When customer evidence shows differing opinions, triangulation needs to set out a clear and transparent approach for balancing these. Balanced decisions should be documented and evidenced to provide visibility.
- 4) **Defined decision-making framework.** To show the consequence of weighting and combining data sources, which then feeds into the business plan, or whether insight needs revisiting.

Examples of good practice

Wessex Water - Approach to conflicting evidence

Wessex Water took a three-step approach to including conflicting evidence. Firstly, reviewing the impacts of any inputs they had imposed upon the study. Then they undertook additional cognitive interviews with respondents to ensure that the results were being interpreted correctly. Lastly, they made use of sensitivity analysis to understand how the different findings would impact valuation.

Anglian Water and South West Water made use of a weighting matrix based on an assessment of sources robustness and relevance (as related to the assessment purpose). The higher the degree of robustness and relevance, the higher the weighting the evidence receives. Robustness was assessed by taking account of the research method used to generate the primary data and its suitability for triangulation. Relevance was determined by reviewing the relevance of the evidence to the service area being triangulated.

Recommendations for good practice

- **Balanced decisions should be at the core of triangulation.** Where information is gathered to identify new research areas or where feedback agrees, triangulation plays a limited role. The triangulation process starts by identifying the conflicting points within the body of evidence where balances between values and opinions need to be made and transparently showing the resulting decisions.
- **Triangulation should be informed by a transparent and consistent weighting framework.** A transparent and consistent process to the weighting of disparate insight streams provides a robust process and enables transparency.

4. Validating customer preferences and values

Summary

The key objective of this step in the process is to be able to clearly demonstrate how companies have validated the outcomes from their weighting and combination of insight sources to check that these are an accurate and realistic reflection of customer and stakeholders' views.

Typically, this is the part of the valuation process where companies brought in their qualitative insight and used this to validate the findings from valuation triangulation. Where this validation step has led to value adjustments, this needs to be documented in a transparent manner, especially if judgement is being applied. This avoids the risk of the process for using qual to adjust for quant valuation bias also needs to be transparent and documented especially if judgement has to be used. This helps to avoid bias in the use of validation data and resulting decisions

Several companies refer in their methodologies to a process for validating and revisiting insight when triangulation outcomes show conflicting views. However, there is little practical demonstration of this in the documentation we have seen, which is a key barrier to this being a transparent and robust step in the overall process.

Barriers to good practice

Internal factors	<ul style="list-style-type: none">• No use of customer or third-party validation• No transparent decision framework to allow reiteration should validation find conflicting evidence• Lack of practical demonstration of validation, in particular demonstration of trade-offs.
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Enablers of good practice

As stated previously, the key enabler to good practice here is to ensure transparency in this stage. The line of sight from customer insight to a business plan can be lost if companies cannot demonstrate how they have validated their findings consistently and transparently.

- 1) **Using multi-factor validation.** A few companies have used at least three levels of validation for findings, typically consisting of an internal challenge, an external challenge with expert customer groups or challenge group (e.g., CCG), and a final independent review.
- 2) **Validating using a wide range of evidence.** Using relevant quantitative and qualitative data to contextualise the findings and responding accordingly Whether to provide confidence that findings are valid, or to flag where there are disparities and further work is required. This approach could also help mitigate risks with over or under valuing WTP through validating these findings using deliberative qualitative research to enable more balanced viewpoints.
- 3) **Running sensitivity and scenario testing.** Some companies refer to the use of these tools to provide a view on the impact of findings upon investment plans. For instance, the use of Multi-Criteria Assessment (MCA) tools to compare the impact of different investment and policy decisions resulting from triangulation.
- 5) **Making research findings publicly available.** There is a range in the extent to which companies have shared their findings with the public. But doing so helps to build transparency into this stage. Best practice would be to make original research reports publicly available.
- 4) **Independent review of the triangulation process.** Given the element of judgement involved in the process as well as the potential for bias, the use of an independent review of the process provided assurance of the validity of the outcomes. Companies have made use of academia or consultancy support to carry out this activity.

Examples of good practice

Wessex Water: publishing research online

Wessex Water were one of the few companies to publish all their original research report on their website. This further supports transparency in the process as access to the original reports rather than collated/synthesised datasets supports a view as to which data has been included or excluded in the process.

Recommendations for good practice

- **Triangulation should be informed by a transparent and consistent weighting framework.** A transparent and consistent process to the weighting of disparate insight streams provides a robust process and enables transparency.
- **Validation of findings should make use of a wide range of datasets.** Validation findings are made more robust and transparent through comparison with a range of quantitative and qualitative data. Comparison with findings from other sectors further lends robustness to outputs.

5. Incorporating validated findings into decisions

Summary

Most companies used valuation triangulation to inform their performance commitments and the levels of penalties and rewards associated with this. Within this, some companies went further and only looked to triangulate performance commitments where there were no existing statutory performance levels, there by only focusing on areas where customers could make a direct impact. Triangulation outputs were also used to inform Water Resources Management Plans, as well as business service measures

Also, some companies have referred to business plan triangulation being used as an ongoing process, for instance, repeated annually to inform the development of service improvement as well as the business plan.

Barriers to good practice

External factors	<ul style="list-style-type: none">• Regional approaches to WRMP plan make it difficult for individual companies to test options with their customers• Lack of clear guidance for how outputs for triangulation should be applied
Internal factors	<ul style="list-style-type: none">• Reactive approaches led to this process being rushed or poorly evidenced due to business plan timelines• Poor transparency around how insight ultimately ended up informing business plans or not

Enablers of good practice

- 1) The key enabler at this stage is the use of a **robust and transparent decision framework**. This links back to the first step of the process where companies need to ensure that their engagement has been set up and applied with a clear purpose i.e., inclusion in business plan, service measures. For example, the ability to show how specific engagement or insight was used within triangulation and the specific components of business planning impacted by this.

Examples of good practice

Yorkshire Water- a total value impact approach

Yorkshire Water used a Total Value Impact Assessment approach to demonstrate how customer research and priorities informed the company's Five Goals. The tool demonstrates clearly where trade-offs need to be considered when making decisions, and how customer insight informed these. The tool makes use of qualitative and quantitative data.

Anglian Water- an iterative approach to including outputs in the business plan

The impact of triangulated customer valuations on the business plan were assessed in stage 3 of Anglian's five stage approach. The company made use of optimisation scenarios, and materiality impact assessments to understand the impact of the valuations on the business plan and proposed service levels. The use of valuation data in developing the business plan was an iterative approach and updated as additional data became available from continued customer interactions. The triangulation results directly impacted on performance commitments, ODIs and investment cases, as well as the WRMP.

Recommendations for good practice

- **Companies should seek independent assurance of their processes and outcomes.** This should cover assurance of the whole triangulation process. It should also assure and review the outcomes generated.

5. Opportunities to better evidence good practice

This section sets out the findings relating to specific components of the triangulation process where as a sector, there has been limited transparency or detailed evidence to demonstrate the application of good practice. For PR24 companies should explore further how these opportunities could be further evidenced.

1. Steps taken to reduce bias

One of the conclusions about triangulation stated in the 2017 ICF/CCW report is that 'deliberate steps must be taken to avoid confirmation bias; favouring sources that agree with an already-established hypothesis'. Based on the documentation that we have seen in this study there is limited practical evidence of how companies have put in place these deliberate steps.

This partly reflects the transparency around weighting processes, for instance, those companies with consistent and transparent weighting approaches are better placed to demonstrate evidence of a deliberate approach to avoiding bias. Where companies have used expert judgment or RAG status this is less clear.

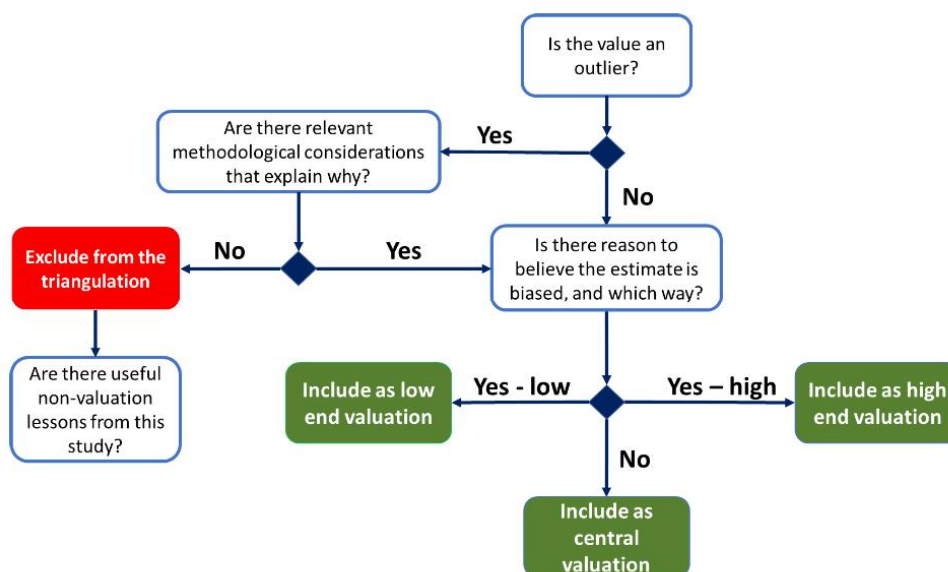
Companies have also typically validated their valuation triangulation outputs by comparing against wider qualitative customer insight to check the credibility of these findings. This approach builds in an additional layer of assurance and control but needs to be evidenced and transparent to address risks of bias at this stage, for instance, confirmation bias.

What would good look like?

- Clear demonstration of how triangulation processes have been designed to address bias.
- Evidence demonstrating whether bias in sources/values was detected and if so, how this was then used within the process.
- Use of assurance to review the risk of bias in the overall process.

Bristol Water- a process for assessing bias

Bristol Water's PR19 Triangulation process includes a specific evaluation of whether a value is biased and sets out how this is then correspondingly treated. Providing detailed examples or evidence of how this stage was used in practice would greatly support the clarity and confidence in how bias is treated in triangulation processes.



2. Balancing the views of different customer segments

Companies have demonstrated mature approaches to the segmentation of qualitative and quantitative data to reflect differences between their customers. For instance, segmenting customers based on factors such as geographic, socio-economic, and vulnerability.

When reviewing how this was then incorporated into the triangulation process, there is limited evidence in business plans for how companies made trade-offs between different customer segment preferences in their triangulation process. Some companies have stated that customer opinion was broadly consistent between segments except for a few specific areas. Where this did occur, some companies used sensitivity testing to understand the impact of these differences.

What would good look like?

- Understand customer's views as to their preference for how balances should be reached between different segments e.g., enable a conversation between current and future customers and discuss the implications of any differences between these segments.
- Clear demonstration of consideration of customer segments and evidence of how trade-offs were made when differences between these occurred.
- Benchmarking or visualisation tools to show the range of customer segment values for given service measures.
- Results of sensitivity testing to demonstrate evidence of the impact of differing customer segment values.

Energy Sector- Distribution Network Operator (DNO) use of customer segmentation in triangulation

Some DNO's in the Energy sector, have undertaken triangulation through applying a weighting methodology model that incorporates stakeholder type. The models typically derive a weighting value of the stakeholder segment based on a combination of how well represented the customer group is, the level of influence and the knowledge on the specific area being assessed.

Whilst these approaches show how segmentation is incorporated in business plans, companies need to ensure that they are not subjective so as to maintain a high level of transparency and robustness associated with this step.

3. Realising the full value of engagement activity

It can be difficult to ascertain specific linkages between the extensive range of engagement undertaken for PR19 and how this ultimately influenced business plans. For example, whether engagement results were fully used or became superseded by alternative information through triangulation processes. This serves to prevent a clear line of sight between engagement activity and how this was then used to inform decisions.

As companies move to a more ongoing approach to customer engagement and the use of triangulation, it is critical that companies use transparent approaches to demonstrate the influence of customers upon decisions and reflect the impact of specific research activity.

What would good look like?

- Clarity on the specific contribution of individual research pieces to business planning and/or ongoing decision making/BAU activities.
- Evidence for which data sources have been excluded/superseded in the triangulation process and why.

Energy sector- Cadent's use of a Relational Database Management System (RDMS)

As highlighted on page 10 of this report, Cadent's approach to storing and using customer data within their decision-making process is an example of how transparency can be enabled as to how insight and research inform decisions.

6. Recommendations for an updated framework and principles.

This section sets out our recommendations both for the application of the outputs of triangulation in PR24, and to update the 2017 ICF/CCW set of principles and framework for triangulation.

Research questions addressed in this section

- 1) Whether triangulation should be used for all aspects of business planning, or only for specific elements (i.e., PCs & ODIs).
- 2) Ongoing triangulation – how companies can put in place frameworks now to capture their BAU and community engagement as part of a rolling cycle of engagement.
- 3) Whether, and if so what, elements of good practice should be adopted by the industry as a whole.
- 4) An update to the ICF/CCW principles and framework to create a new good practice triangulation framework ahead of PR24

Summary

The previous section outlined some of the key blockers that prevent companies from following good practice. The set of recommendations provided here attempt to help remove these barriers and allow companies to ensure their triangulation practices meet good practice.

These recommendations have also taken on board the consistent response from companies when asked about what they want to see with regards to guidance ahead of PR24. Companies are seeking a minimum set of principles and actions that will allow all companies to achieve good practice, this guidance needs to recognise the importance of proportionality given the different size of companies involved. It also needs to avoid being too prescriptive and allow companies the space to innovate as they see fit.

The framework was developed to address the lack of triangulation guidance for companies preparing for PR19. It was based on a literature review as well as interviews with Water Companies. In addition to the framework above, it set out high level principles and questions that companies should be using at each stage of the process.

Use at PR19

Feedback from companies we spoke to as part of this review, was that the framework and principles whilst useful as a benchmark against which to compare their own approaches, lacked practical steps or guidance for companies to follow. Some companies also found it to be too academic focused.

Updating the framework following PR19

When asked about what they would like to see from future guidance in this space, companies have been consistent in asking that it provides the following:

- practical high-level steps that set out a minimum good practice.
- reflects the principle of proportionality given the varying nature of company sizes within the industry.
- is not prescriptive and allows companies to innovate beyond the framework; and
- built upon process used by regulatory recognised best performers in this space.

Our approach to updating the framework has built on the following sources of insight:

- a review of the triangulation process steps undertaken by water companies in PR19 and especially those who were assessed highly in this space in Ofwat's IAP
- a review of the barriers to best practice as identified in the previous section; and
- validation interviews with water companies to test the appropriate level of detail in the recommendations

Principles and success criteria for good triangulation.

Whilst the high-level principles identified in the 2017 framework have acted as a good overall benchmark, we recommend future guidance provides more detailed principles around how the specific activity of triangulation should be carried out, and support defining a minimum good practice standard.

The 2017 report set out four high level conclusions about how triangulation should be applied. Companies used these as principles to assess how their proposed methodologies would meet these criteria



1) Triangulation cannot be black box. It must be a **transparent process** that demonstrates the **approach used** and the **rationale for the weight** applied to each evidence source in any final reasoning



2) Triangulation must be **flexible** to different needs and different situations



3) It must be **explicit** when evidence is **contradictory** and explain what can be learned from those contradictions



4) Deliberate steps must be taken to **avoid confirmation bias**; favouring sources that agree with an already established hypothesis

The report also recognised the challenge involved with comparing different evidence sources (e.g., qualitative, and quantitative). It proposed four principles to help water companies formulate their triangulation.



1) **Contributory evidence** - evidence should contribute to water companies' understanding of their customers' priorities, needs and values



2) **Methodological soundness** - evidence should have been generated using methods that have been soundly applied, with sufficient evidence to demonstrate that is the case.



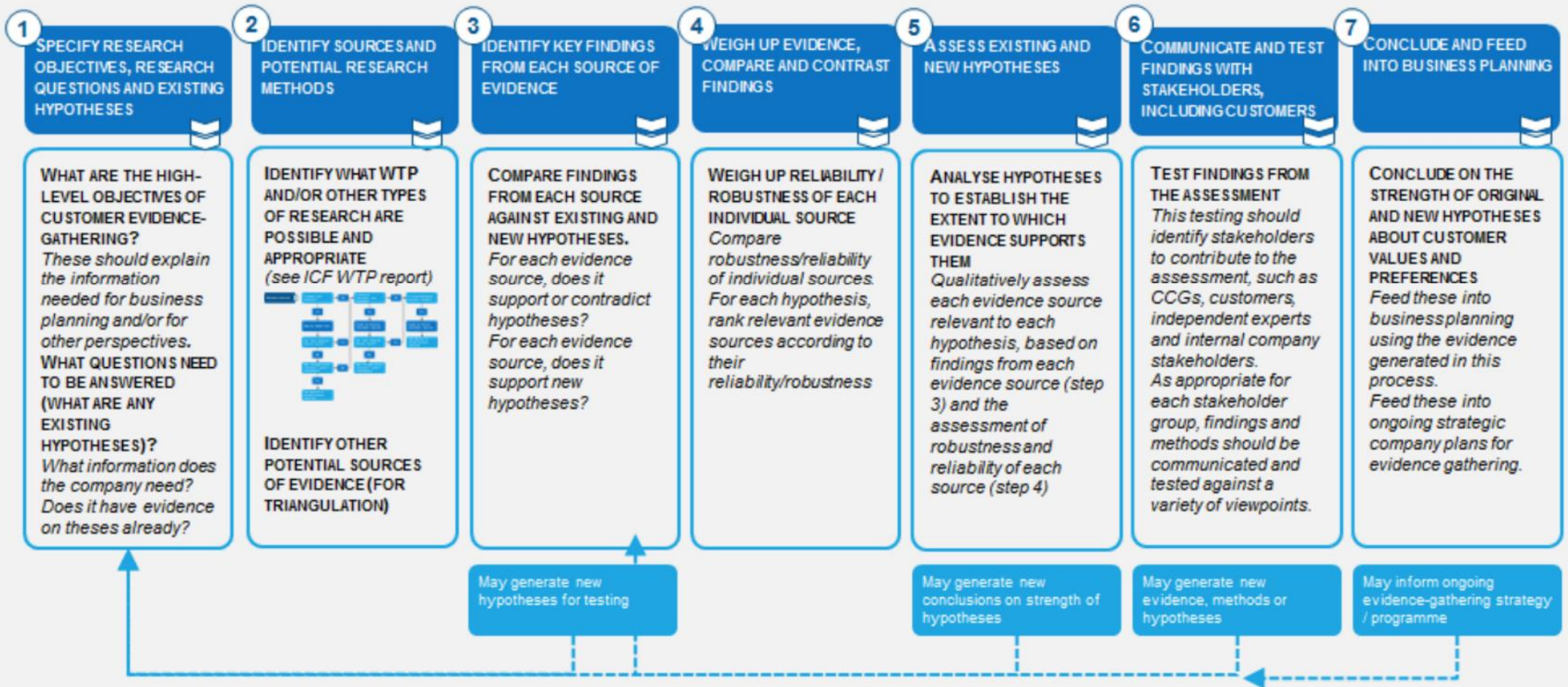
3) **Rigorous data gathering** - evidence should have been gathered in such a manner as to maximise the amount of information gained from the evidence, without introducing any bias into the evidence, with sufficient evidence to demonstrate that this is the case.



4) **Credible interpretation** - conclusions drawn from the evidence must be credible, including sufficient exploration of alternative interpretations of the same evidence and comparison of the various sources of evidence explored for each alternative interpretation.

The 2017 ICF/CCW Framework

FRAMEWORK TO BE CONSIDERED AFTER SETTING **STRATEGIC OBJECTIVES**, DESIGNED TO IDENTIFY WHAT CUSTOMER EVIDENCE WATER COMPANIES NEED TO GATHER AND WHY, AS WELL AS PRIORITISING ACCORDING TO ITS VALUE AND INFLUENCE ON BUSINESS PLANNING AND/OR OPERATIONS



Recommendations to enable good practice triangulation for PR24

These conclusions and principles, whilst high level, are still valid and should be used by companies as criteria against which to assess and assure their triangulation approaches. However, companies have told us that for PR24 they need more detailed guidance on what good triangulation should look like. Recognising that any recommendations need to avoid being prescriptive to allow companies to innovate. These also need to be proportional to reflect the range of companies and capabilities within the sector. The following criteria aim to address these needs and should be used as a minimum good standard benchmark by companies to assess whether their triangulation processes meet a minimum level of good practice.



Engagement should be an ongoing process. Designed to show how customer opinion has evolved over time and how this impacts decisions. A designed approach will consist of specific phases for triangulation with prescribed outcomes and research questions at each stage.



Triangulation should make use of a wide range of inputs and these should not be solely engagement insight. The quality and breadth of data used to drive triangulation help to determine the robustness and transparency of the process.



Balanced decisions should be at the core of triangulation. Where information is gathered to identify new research areas or where feedback agrees, triangulation plays a limited role. The triangulation process starts by identifying the conflicting points within the body of evidence where balances between values and opinions need to be made and transparently showing the resulting decisions.



Validation of findings should make use of a wide range of datasets. Validation findings are made more robust and transparent through comparison with a range of quantitative and qualitative data. Comparison with findings from other sectors further lends robustness to outputs.



Triangulation should be informed by a transparent and consistent weighting framework. A transparent and consistent process to the weighting of disparate insight streams provides a robust process and enables transparency.



Companies should seek independent assurance of their process and outcomes. This should cover assurance of the whole triangulation process. It should also assure and review the outcomes generated.

Enabling sector-wide collaboration

Increasing sector collaboration

In addition to the above framework recommendations, several companies have told us they would welcome a platform to allow sharing of approaches across the sector. Given the varying nature in both size and experience of engagement teams that will carry out this work and the likelihood that personnel involved may change over the planning period, there is demand for helping upskill these teams by sharing good practice. Examples of how this could be achieved include facilitated workshops, company collaboration to use shared expertise, and a strong sector engagement network to be established.

This approach is supported by Citizens Advice⁷ who have called for a similar approach in the energy sector stating '*Consumers stand to gain when companies share and collaborate on customer engagement. They can avoid duplicating efforts, learn from each other's mistakes and successes, and avoid engagement fatigue among customers.*' Sustainability First⁸ echo this calling for '*the need to embed a culture of engagement and collaboration within companies to support purposeful working*

⁷ Citizens Advice 2015: Strengthening the voice of the customer in energy network company's business plans

⁸Sustainability First 2021: Regulation for the Future: for Policy and Regulation in Utilities

including ongoing partnership working, collaboration and decision making which responds to changing consumer and community needs.'

CCW⁹ have also called for greater engagement collaboration ahead of PR24 stating the need for 'More collaborative research on shared challenges to support innovation, reduce the research gap between smaller and larger companies, and introduce consistency in research outputs to support regulation'.

The diagram below sets out some high-level suggested recommendations to update the framework for triangulation. We recognise the variance in triangulation experience and capability within the sector and suggest that future guidance is set out to ensure a minimum standard can be achieved whilst allowing for companies to innovate above and beyond this, as they see fit.

Enabling ongoing engagement and triangulation

From reviewing good practice in the water sector and the energy sector, the following steps would support companies from shifting to an ongoing approach to both undertaking engagement and including the results from engagement activity within business planning.

- **Unlock the value of BAU data.** Developing the analytic capabilities to review vast data sets (customer satisfaction scores, social media, wider media) allows companies to better to identify topics to research further, where deliberative research might be required. We have shown good practice examples from the energy sector for how this can be achieved.
- **A strategic approach to engagement.** Ongoing engagement requires that companies take a strategic approach to the collection of data, to ensure that any quantitative or qualitative customer data can be used to inform decision making. The strategic approach should also identify the relevant decision milestones at which this insight can be applied.
- **Regular sharing of engagement activity and corresponding decisions with customers.** To aid transparency and line of sight companies should review how they can keep customers informed on how their views are influencing company in an ongoing manner.

⁹ CCW 2020: CCW's View on Consumer Engagement at PR19: What Worked Well and How to Build On This

An updated framework

The updated framework reflects the feedback from companies that guidance should be non-prescriptive but provide enough detail for companies to benchmark their approaches.

The original 2017 Framework outlined the steps that should be taken for triangulation once companies had put in place their strategic objectives. Given that for some companies the failure to take a strategic approach to triangulation, plus the importance of this concerning enabling an ongoing approach to triangulation, we propose it is brought into the framework more formally.

We have outlined for each step, the research questions that companies should be asking, a definition of what good looks like, and mapped our recommendations against each stage.

1. A strategic approach to collecting customer evidence

Strategic objective setting was previously a pre-step in the 2017 methodology. The failure of some companies to build in a strategic approach to triangulation was a key barrier to good practice in PR19, it is also essential for companies to move to an ongoing triangulation approach that makes use of BAU data. So as such, we propose it becomes the first step of a triangulation framework, with a focus on reviewing both the outcomes' companies want to get out of triangulation (be it specific valuation outcomes or an understanding of how customers' priorities are evolving over time). Companies should also endeavour to include as wide a variance of data sets in this approach as per our recommendations.

An opportunity for stretch performance at this stage would be for companies to develop analytic capabilities to review vast data sets (customer satisfaction scores, social media, wider media) to identify topics to research further, where deliberative research might be required.

2. Collecting, collating, and synthesising customer evidence

This covers the steps to collect and then collate and analyse evidence and insight. Key considerations here are the categorisation approaches used by companies as these should allow a greater range of insight as well as allow replicability of results to aid transparency. Good practice should be to collect evidence over stages to enable an evolving understanding of customer needs with specific questions and outcomes determined at each stage.

An opportunity for stretch performance at this stage would be for companies to aim to allow results to be recreated if tested independently. This could be enabled through linking all other decision-making tools to an evidence database (e.g., engineering papers, industry benchmarking).

3. Weighting and combining customer evidence

Transparency, robustness, and consistency are key to affecting weighting, and comparison of evidence. Whilst a range of approaches can be used, they need to be evidenced with a clear view as to the outcomes and decisions. Good triangulation should seek out conflicting views and evidence how the company then makes a trade-off between these in its decision making.

An opportunity for stretch performance at this stage would be for the inclusion of more indicators to the weighting calculation, such as a stakeholder's impact, influence and others. Specify weightings based on relevance to the service measure being assessed.

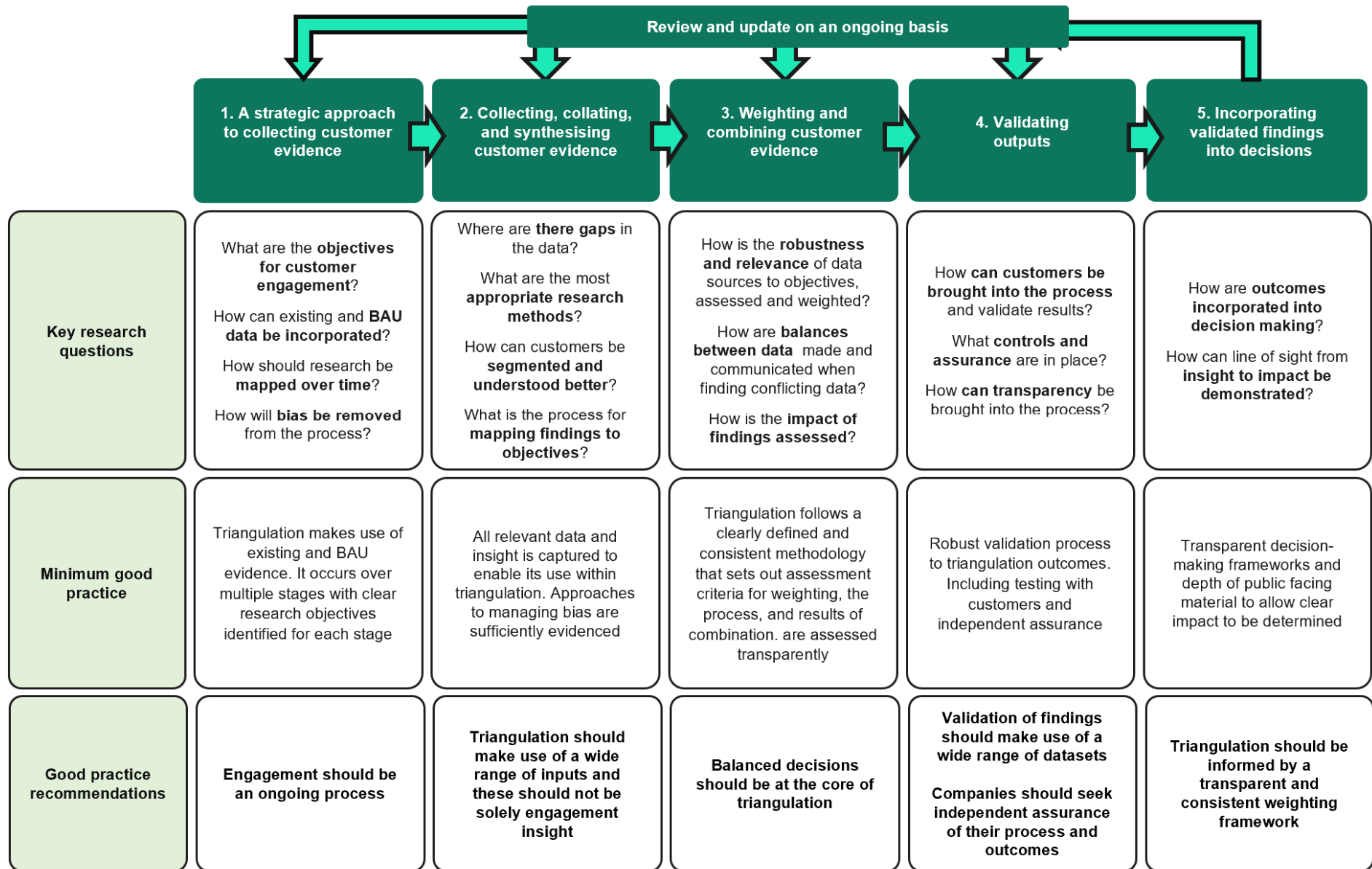
4. Validating outputs

Validation here refers not just to the validation of outcomes but also to the process followed to derive these. Companies should be making use of independent assurance of processes and outcomes. Companies should bring customers into the heart of validation, with examples of good practice including, the use of cognitive interviews with customers as well as engagement with challenge groups (CCGs). The validation of impacts upon business planning should be demonstrated for instance the use of scenario or optimisation tools.

An opportunity for stretch performance at this stage would be to retest findings and making clear what decisions are made based on these (e.g., you said, we did) at each applicable planning stage.

5. Incorporating validated findings into decisions

The outcomes of triangulation should be used within planning (whether business plans or ongoing service measures) in a transparent and consistent approach. Companies can enable this by making use of a transparent decision process, taking a staged approach to business planning, and providing public documentation that allows the clear impact of triangulation to be determined.



7. Conclusions

There is significant variation in the approaches to triangulation undertaken by companies at PR19. Several companies have demonstrated aspects of good practice, with mature and robust processes, others performed less well with more reactive and opaque processes. Companies that did well in this space are already moving ahead with plans and approaches for PR24 with examples of proposed ongoing or iterative triangulation to inform their planning.

Companies have extensive customer information, whether research led or collected as part of business as usual. Moving to an ongoing approach to engagement and triangulation helps realise the value of this data as well as enable a clear line of sight between customer needs and values and ongoing business decisions.

Companies have told us that the 2017 ICF/CCW framework and principles, whilst useful as a benchmark against which to compare their approaches, lacked practical steps or guidance for companies to follow. Some companies also found it to be too academic focused.

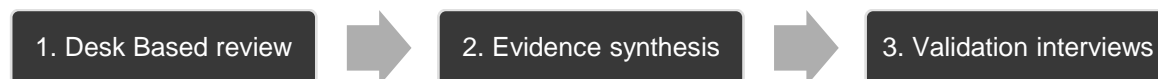
For future guidance, companies have asked that it is framework based and used to set out more detailed criteria for good practice triangulation whilst avoiding prescribing specific methods or approaches to create space for companies to innovate.

We have proposed a series of criteria that aim to fulfil this objective and recommend they are used in conjunction with the high-level principles set out in the 2017 ICF/CCW report.

8. Annex 1: Methodology

Our method for this study is briefly outlined in this Annex.

The study was based on three stages as shown in the figure below:



Stage 1: Desk based review

Due to the varying consistency of publicly available documentation published by water companies, we designed a formal RFI to ensure we had sufficient breadth and depth of evidence upon which to base this study.

The RFI sought the following information from companies

Part 1: Formal triangulation documentation, namely:

1. Triangulation methodology for PR19
2. Independent review of PR19 triangulation methodology (if available)

Part 2: Qualitative questions focused on:

- a. Comparison of PR19 triangulation practice against the 2017 framework
- b. A view of plans for triangulation in PR24

To aid the compilation of this document, we simplified the 2017 framework from seven to five steps as shown below.

The table below details the specific questions we asked, and how these mapped against the 2017 framework.

2017 Framework element	2021 RFI Framework	Question
Specify research objectives, research questions and existing hypothesis	1. Strategic objectives	Was the process designed iteratively to enable synthesis and triangulation over a period of time, or was it a one-off activity linked to the business plan? Was your triangulation process undertaken internally or outsourced?
		What steps did you take to determine the strategic research objectives and hypotheses to test, how did you validate these with customers/CCG?
		What was your process for reviewing the evidence base available and designing a research programme to address your objectives and hypotheses? How did you incorporate BAU data?
Identify sources and potential research methods Identify key findings from each source of evidence	2. Evidence synthesis	What was your approach to synthesising feedback sources? Did you have a centralised, consistent approach to storing feedback sources? What tools did you use to enable this? How did you identify and manage any gaps in the evidence base?
		To what degree of granularity did you collect data? (i.e., was data attributed to individuals or stakeholder type, was data recorded verbatim or summarised?)

Weigh up evidence, compare and contrast findings, Assess existing and new hypotheses	3. Triangulation mechanics	Please describe your approach to weighting sources. Was this uniform across all source types? Did you apply numerical scoring? Did you exclude any data sources?
		What was your approach to finding and analysing data that conflicts or is contrarian to your original research hypotheses? Was this approach designed or reactive?
Communicate and test findings with stakeholders including customers	4. Validation and transparency	How did you validate your findings?
		What steps did you take to make the triangulation process transparent? Were you transparent about the weighting approach taken?
Conclude and feed into business plan	5. Business plan integration	What was your approach to integrating triangulation results into business plan decisions? Was this a designed approach or governed by the timelines of submitting plans?
		Which components of the business plan were directly impacted by triangulation results? (e.g., Performance commitments, investment cases)

In addition, we asked the following general questions to gain insight as to companies' ability to follow the 2017 methodology, as well as their plans for Pr24.

Applying the 2017 methodology	What factors determined your ability to follow the 2017 methodology?
	Were there any elements of the framework you modified or improved?
Plans for PR24	Looking back to PR19, is there anything you would do differently? What benefit would this bring?
	What do you want to see in place for triangulation in PR24 to improve the process?
	What would you want from a best practice triangulation methodology to enable you to deliver better ways of working in your company?

We also reviewed publicly available triangulation documentation from other sectors, in particular the energy sector, to identify potential sources of good practice that could be applied to the water sector

All water companies in England and Wales were given the opportunity to contribute to this study. The following companies provided documentation for this study:

- Affinity Water
- Anglian Water
- Bristol Water
- Northumbrian Water
- Portsmouth Water
- Sutton and East Surrey Water
- Severn Trent
- South East Water
- South Staffordshire Water
- South West Water
- Southern Water
- Thames Water
- United Utilities
- Wessex Water
- Yorkshire Water

Stage 2 Evidence synthesis

We undertook a desktop review to collate and compare companies' methodologies, their RFI questionnaires, as well as applicable publications and insight from the energy sector. This work included a review of the following insight for water companies.

- Sources of insight triangulated (engagement, research, historical info, regulatory input, CBA)
- The granularity of engagement data collected
- Storage/presentation of content for triangulation
- Weighting methodologies (how different sources were compared against one another)
- Internal vs external input into the triangulation process
- Seniority/hierarchical input into triangulation process
- Triangulation approach over time (phases of business plan development)
- Strategy and approach to customer engagement over entire AMP period

Given the range of triangulation experience within the water sector we used this approach to highlight the barriers and enablers to good practice based on the CCW 2017 framework steps, with the aim that the outputs of this study serve to assist companies who struggled to apply triangulation in PR19.

Stage 3: Validation interviews

To ensure our recommendations are evidence based and reflect companies experience of Pr19 and expectations for PR24, we validated our findings and recommendations with a number of companies who helped us build and refine these further.

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