



Centre for  
**Strategy & Evaluation  
Services**

# Innovation baseline in the water sector

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## Evaluation support to Ofwat's Innovation Fund

### A Report to Ofwat

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## Executive Summary

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### Introduction

This report for Ofwat offers a baseline for the level of innovation in the water sector in England and Wales, covering water and wastewater companies and their supply chains. It looks at two main dimensions of innovation:

- the capacity for and approaches to innovation of the water companies.<sup>1</sup>
- the innovation “ecosystem” of the wider sector, in terms of collaborations between water companies and other players, as well as the regulatory environment insofar as it affects innovation.

On that basis, the report has taken the 2019 price review (PR19) business plans as a starting point and used other sources of evidence (mainly surveys and interviews with water companies) to assess progress made since then.

The background to the report is the need for greater innovation in the water sector highlighted by previous studies and reports. In 2009, an Independent Review of Competition and Innovation identified a fall in expenditure on research and development (R&D) in the sector between the early 1990s and 2009.<sup>2</sup> In 2019, the Ofwat price review found that most water companies were still in the process of developing the culture and mechanisms required to facilitate effective innovation and collaboration.<sup>3</sup> At the same time, it should be noted that two features of the water sector tend to make companies and regulators quite risk-averse, which can potentially hinder innovation. First, innovations are difficult to be introduced if they would increase risks to drinking water quality or environmental standards. Second, financial investments in innovation need to offer a good prospect of better services or lower prices for customers within a reasonable timeframe, if they are not to be seen as a poor use of customers’ money.

Given this situation and in order to boost innovation, an alliance of 19 water companies,<sup>4</sup> UKWIR and Water UK published the UK 2050 Water Innovation Strategy. In parallel, Ofwat has taken steps to promote innovation in line with its strategy “Time to act, together”.<sup>5</sup> These include StreamLine (the regulatory advice service for water innovators),<sup>6</sup> incentives included in the 2019 price review (PR19), assessing the performance of the business retail market, encouraging the new appointments and variations market (NAVs), and the Innovation Fund. The Innovation Fund makes available £200m to grow the water sector’s capacity to innovate, enabling it to better meet the evolving needs of customers, society and the environment. Ofwat’s intention is that the £200m Fund will be delivered by 2025. Funding has to date been awarded through competitions that water companies, in partnerships with others, can enter to develop innovations that benefit customers, society and the environment. The Innovation Fund will be the subject of an evaluation for which Ofwat has overall responsibility and which Challenge Works is supporting by ensuring the right framework and data collection is in place.

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<sup>1</sup> Throughout the report “water companies” refers to providers of water/ water and wastewater services, as well as the new appointments and variations (NAVs). For a list of regulated water / water and wastewater companies, see: <https://www.ofwat.gov.uk/regulated-companies/ofwat-industry-overview/licences/>.

<sup>2</sup> Cave (2009), Independent Review of Competition and Innovation in Water Markets.

<sup>3</sup> Ofwat (2019), PR19 final determinations: overview of companies’ final determinations.

<sup>4</sup> 17 in England and Wales plus Scotland and Northern Ireland.

<sup>5</sup> Ofwat (2019), Time to act, together: Ofwat’s strategy

<sup>6</sup> <https://www.ofwat.gov.uk/streamline/>

## Water companies' capacity for and approaches to innovation

In the previous price review period (PR14), Ofwat promoted the inclusion of innovation as a general principle to be taken into account in water companies' business plans. Ofwat's requirements for PR19 went further, requiring companies to specifically state in their business plans how they would build on and develop innovations. Reflecting this, innovation is presented as a prominent and explicit high-level objective in most water companies' business plans. Nearly all business plans feature a section dedicated to innovation, which sets out a comprehensive and strategic approach, although most business plans do not feature Key Performance Indicators (KPIs) specifically related to innovation.

Some water companies approach **innovation as a distinct corporate function**. To this end, most of the large water companies have senior staff responsible for innovation, as well as dedicated innovation units or managers. Some medium-sized water companies have small innovation teams dedicated to innovation, as well as more staff for whom innovation is part of their work. The small water companies tend to prioritise mainstreaming innovation into most or all activities, as part of the company ethos, culture and mindset, rather than as a dedicated function in its own right.

Most, if not all, water companies take steps to promote broad **awareness of innovation** across the company. Linked to this, there are instances of the leadership of water companies (e.g. Chief Executives or other board members) proactively promoting innovation to all staff. Some water companies have a specific and structured process for soliciting innovation proposals from their workforce and taking forward the most promising ones. These go beyond mere "employee suggestion schemes" to include a specific focus on innovation (rather than just good ideas), an openness to all staff, wide promotion across the firm and a structured approach to taking forward - and financing - suitable proposals. Some water companies have specifically trained senior staff in innovation. Here the intention is to embed an innovative mindset at senior level and, through that, support a broader culture of change across the workforce. It can also help staff to understand how the innovation process can work, in terms of stimulating new thinking, piloting ways to test new knowledge, processes, techniques or technologies, assessing success and rolling out effective solutions. However, feedback has suggested that the level of innovation culture and mindset varies across the sector and within water companies.

Water companies across England and Wales have undertaken a number of **innovation activities** across various areas as they look to improve customer service, meet environmental challenges and engage with the wider community. Companies are not only financing research and development activities and enhancing infrastructure to support the supply of water but also adopting new solutions in the data field, taking advantage of burgeoning technologies such as artificial intelligence to implement efficiencies in the sector, such as saving water and reducing repair times. In addition, companies are actively engaging with the public and providing staff training to raise awareness of the benefits of innovating to bring about secure, affordable water supplies.

The **trailing and rolling out of innovations** can be considered an indication of a company's capacity to initiate and implement innovative solutions across the company. Whilst a number of successful trials have been rolled out across water companies, some water companies have developed very structured ways of tracking innovations across the company, which facilitates the capturing of results company-wide and the scaling up of innovations. The testing of new technologies, techniques, etc. is of course part of the normal cycle of operations within the water sector, given the central importance of engineering and infrastructure. However, some water companies have gone beyond this to track the innovation process itself, in order to capture evidence, identify future needs and opportunities and learn lessons.

There are instances of water companies **adopting innovative solutions tested by other companies** in the sector. However, the different geographies served by the water companies can hinder the transfer

of innovation; innovations that prove successful in one area do not necessarily transfer successfully to another area. Moreover, water companies may often be unaware of which innovations have been successfully tested and rolled out elsewhere. Whilst water companies have shared experience on a bilateral basis through formal or informal networks, the sector has until recently suffered from a lack of co-ordination on such issues. In this context, the creation of the [Spring Centre Of Excellence](#) in 2021 (with some of its initial setup costs financed by the Innovation Fund) offers the potential to fill this gap, not least through its “communities of knowledge”.

## Innovation ecosystem

For the full benefits of innovation to be realised, there is a need for water companies not only to undertake their own innovation activities but also to engage with the wider innovation “ecosystem” of multiple and interconnected stakeholders, including other water companies, sector-level bodies, suppliers, universities and research bodies, regulators, national and local government, and communities. The nature, scale and quality of the relationships and interactions between these different stakeholders can be crucial to enabling water companies to innovate effectively. To that end, the PR19 process required water companies to look beyond their boundaries in addressing the challenges they face and develop more effective co-operation with third parties to deliver for customers.<sup>7</sup>

Prior to the Innovation Fund, a certain level of **networking and sector-level collaboration** helped address common problems and promote sector interests. A significant resource informing sector-level collaboration is offered in the form of UK Water Industry Research (UKWIR), which undertakes research into all aspects of the water sector on behalf of its members, who include the water companies of the UK and Ireland. There were also examples of water companies taking a multilateral approach to collaboration around innovation. However, prior to the Innovation Fund, the sector lacked a comprehensive and formal mechanism for initiating and co-ordinating multilateral collaboration around innovation. Moreover, the regulatory system of comparing companies and ranking them at price reviews creates a form of competition which incentivises innovation. However, this may reduce openness to information-sharing and collaboration.

This gap has since been partly filled through the establishment of the **Spring Centre of Excellence** for Innovation, which was backed by the regional water companies<sup>8</sup> in the UK and Ireland, and supported by a strategic steer from sector-level bodies (including UKWIR) and Ofwat, as well as initial funding from the Innovation Fund.<sup>9</sup> Spring’s “communities of knowledge” could strengthen collaboration around shared challenges facing water companies or around specific new innovations; the communities could enable the sharing of experience around the utility and feasibility of different innovation. There may also be scope to mirror at sector level some of the approaches taken by individual water companies to engaging suppliers, such as structured networks for supporting suppliers to bring forward innovations, a single point of entry or open model of soliciting innovations, open events for soliciting innovations for potential suppliers, or pilot projects with suppliers. Spring has already taken steps in this direction, for example, through its “Innovation Challenges”, which give innovators the opportunity to share their solutions with the water companies in relation to key themes in the UK 2050 Water Innovation Strategy.

<sup>7</sup> [Ofwat \(2017\), Ofwat’s price review: Delivering more of what matters. Our final methodology for the 2019 price review – executive summary, p.4.](#)

<sup>8</sup> Throughout the report “regional water companies” includes the 17 providers of water/ water and wastewater services, it excludes the new appointments and variations (NAVs), see: <https://www.ofwat.gov.uk/regulated-companies/ofwat-industry-overview/licences/>.

<sup>9</sup> [Meet the Partners - Spring Innovation \(spring-innovation.co.uk\)](#)

**Water companies** also cooperate on a bilateral basis, which offers opportunities for discussions around innovation and joint research projects. This includes information-sharing exercises, co-sponsorship of PhDs, events and discussion of ongoing challenges, such as leakage reduction. Collaboration also takes place on a multilateral basis, which is unsurprising given that areas of interest are generally shared across the industry and Spring is helping to promote such collaboration.

**Supply chains** of water companies are potentially a key source of innovations in the sector, since the water companies typically have to procure a substantial amount of goods and services. Interactions with suppliers range from one-off or ad hoc purchases to long-term, multi-faceted and structured relationships. However, water companies will not be aware of every available innovation that is potentially of benefit to them, whilst suppliers may not know the precise needs of water companies. There may also be innovations in other utility sectors with potential application to the water sector but as yet untested in the sector. The water companies report that there is no shortage of potential suppliers offering them innovations. However, it can be a challenge to identify the most appropriate innovations. Some suppliers offer innovations that may be unproven in the water sector or that might not be relevant to the specific challenges facing the company. Indeed, the diversity of the water companies and of their geographical areas means that innovations cannot always be easily transferred from one company to another. Given these challenges, some water companies have taken steps to source innovations from their supply chain including: structured networks for supporting suppliers to bring forward innovations; single points of entry or open models of soliciting innovations; open events for soliciting innovations for potential suppliers; pilot projects with suppliers; and promoting innovations through the procurement process.

As in other sectors, water companies face the need to stimulate innovations that are not yet market-ready, which typically requires engagement with the **research and development sector**, including universities, research institutes and private companies. All the water companies have established relationships with at least one academic or research organisation to develop upstream innovations, although the nature, depth and intensity of these relationships varies both within and between water companies. Some water companies are co-partners in research units within universities, whilst others have formalised “strategic relationships” with universities and research bodies. However, much of the collaboration with the research sector has been dependent on EU funding, which is no longer available since the UK left the EU.

In general, the water companies have not extensively engaged the **education and training sector** in providing innovation training as such. Whilst most, if not all water companies have ongoing collaboration with the education and training sector, only a few have specifically made use of innovation-specific training offered by the education and training sector.

There are instances of water companies collaborating with **local authorities** and other local stakeholders. All the water companies have to engage with their relevant local authorities, for example, around planning or land use. Some have developed more proactive collaborations around innovation. Local authorities can see themselves as playing a key role in brokering relationships between local communities, local firms (particularly SMEs), academia and water companies, as a means of stimulating new approaches to tackling economic or environmental challenges. However, more often, water companies collaborate with local authorities on innovative projects rather than on the promotion of innovation.

There are instances of water companies collaborating with **regulators** around innovation. In the provision of water and wastewater services, water companies are subject to regulation not only by Ofwat but also by other regulators, including the Environment Agency, Natural Resources Wales and the Drinking Water Inspectorate. In some cases, these regulators engage with water companies in respect of innovation. Such collaborations address shared objectives of the water companies and regulators. They tend to be responses to specific local challenges and often form part of a broader



collaboration around environmental stewardship and land management. Very often, they involve a wider range of partners, such as local authorities, universities, landowners or farmers. In addition to these ad hoc instances, Streamline offers a structured way for innovators and businesses to receive support for innovation in the form of non-binding regulatory advice on rules and regulations. Whilst the collaborations around innovation typically feature some dissemination of information, knowledge and experience, this is not co-ordinated across the sector. Moreover, the dialogue around innovations tends to take place with individual water companies on specific issues, rather than at sector level on common challenges and how to transfer effective innovations between companies. There may be scope for Spring to address this by facilitating sector level dialogue on innovation between regulators and water companies.

Some water companies are accessing innovation **funding from other sources**, such as HM Treasury's Shared Outcomes Fund. However, some water companies report difficulties in accessing financing for innovations.

### Conclusions on innovation

- As required by Ofwat, all water companies demonstrate a commitment to innovation through their PR19 business plans. However, the evidence of innovation and the nature and extent of action taken to fulfil such commitments varies from company to company, reflecting their specific circumstances but also their different “starting points” in terms of innovation.
- There is no one single specific corporate “model” of innovation that all water companies should adopt. Whilst some, typically the large companies, approach innovation as a distinct corporate function with dedicated staff and resources, others, typically the smaller companies, prioritise mainstreaming innovation into most or all activities. Both approaches can be valid but also carry their own risks.
- Water companies have undertaken a wide array of innovation activities over the last few years. However, the challenge remains to promote more consistent and structured ways for successful innovations to be scaled up within companies to become business as usual and transferred between different companies.
- There have been instances of water companies adopting solutions from others in the water sector. However, the transfer of innovation can be hindered by the different geographies served by the water companies and by a need for greater knowledge amongst water companies as to which innovations have been successfully tested and rolled out elsewhere.
- At sector level, there is a need for strengthened collaboration around shared challenges and around the best way to engage suppliers of innovations, as a complement to individual water companies' own efforts. Spring's “communities of knowledge” may offer one means to do this. Small water companies might particularly benefit, given their more limited resources for scanning the market and engaging suppliers.
- At sector level, there is also a need for greater action to engage suppliers of innovations, as a complement to individual water companies' own efforts, for example, through structured networks for supporting suppliers to bring forward innovations, a single point of entry or open model of soliciting innovations, open events for soliciting innovations for potential suppliers, or pilot projects with suppliers.
- The established relationships between water companies and universities or other research bodies are an important driver of innovation. However, they are threatened by the loss of EU funding in light of Brexit.
- At sector level, there may be a need for dialogue and collaboration as to how the education and training sector can best support the building of innovation capacity. Innovation-specific training is



available; however, it is not widely used and companies often consider that it does not serve their innovation objectives.

- The full potential of collaboration with other regulators is not fully exploited, due to the lack of a structured forum at sector level for water companies to engage with other regulators in relation to innovation (although Streamline provides a means by which innovators and individual water companies can get advice from regulators).

## Reflections on the innovation framework

The current study has tested a framework for assessing the state of innovation in the sector prior to the introduction of Ofwat's Innovation Fund. Having tested the framework, we offer some reflections here on its utility.

- The review of business plans can enable a "first-level" assessment of approaches to and capacity for innovation, with the advantage that the plans are publicly-available corporate documents and authoritative and accurate, having been approved as part of the price review process.
- The level of staff and resources committed to innovation can be informative, provided that due account is taken of the size of water companies and their choices around whether innovation is treated as a discrete corporate function in its own right, or mainstreamed across the company.
- In line with the objective of the Fund to bring about cultural transformation in the sector, the emphasis in this baseline has been on corporate commitment, process, and collaboration within the wider innovation ecosystem, rather than on the sufficiency of innovations to address challenges facing the sector. Ofwat might therefore consider additional research regarding the sufficiency of innovation in relation to these different challenges.
- To a certain degree, the current state of innovation in the sector (in terms of culture, commitment and capability), reflects the extent to which regulation offers sufficient appropriate incentives and opportunities to innovate.

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## 1. Introduction

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### 1.1 Purpose of the report

This report is presented to Ofwat as part of the contract to provide “Evaluation support to the Ofwat Innovation Fund”. The purpose of the contract has been to support Ofwat (and its delivery partner Challenge Works, supported by Arup and Isle Utilities) in the evaluation of Ofwat’s Innovation Fund 2020.

The report offers a baseline for the level of innovation in the water sector in England and Wales, covering water and wastewater companies and their supply chains. It looks at two main dimensions in a dynamic sense rather than a static one, i.e. in terms of activities within the current price review period as well as capacity for future innovation. On that basis, the report has taken the 2019 price review (PR19) business plans as a starting point and used other sources of evidence (e.g. surveys and interviews) to assess progress made since then.

First, the capacity for and approaches to innovation of the water companies themselves. This covers their business planning, commitment of resources and culture and mindset, as well as the innovation processes that they follow. Second, the report considers the innovation “ecosystem” of the wider sector, in terms of collaborations between water companies, as well as water companies’ collaborations with the supply chain, research sector, education and training sector and other stakeholders. It also offers some reflections on the regulatory environment insofar as it affects innovation.

Overall, the report presents a high-level overview of the innovation in the sector as it stands. While illustrative examples of innovative activities are included, the report is not intended to be an exhaustive catalogue of all the innovations occurring at different stages of the supply chain, or of particular areas of innovation to address the specific challenges facing the sector (e.g. reducing leakage, reducing carbon emissions, etc.).

### 1.2 Background to the report

A series of studies and reports in recent years have highlighted the need for greater innovation in the water sector in England and Wales. In 2009, an Independent Review of Competition and Innovation identified a fall in expenditure on research and development (R&D) in the sector between the early 1990s and 2009.<sup>10</sup> In 2015, the UK Water Research and Innovation Partnership (UKWRIP) published a report suggesting that the UK is a minor international player in global water innovation markets with a global share in water technology innovation at just 3%.<sup>11</sup> In 2019, the Ofwat price review found that most water companies were still in the process of developing the culture and mechanisms required to facilitate effective innovation and collaboration.<sup>12</sup> At the same time, it should be noted that two features of the water sector tend to make companies and regulators quite risk-averse, which can potentially hinder innovation. First, innovations cannot be introduced that would increase risks to drinking water quality or environmental standards. Second, financial investments in innovation need to offer a good prospect of better services or lower prices for customers within a reasonable timeframe, if they are not to be seen as a poor use of customers’ money.

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<sup>10</sup> Cave (2009), Independent Review of Competition and Innovation in Water Markets.

<sup>11</sup> UK Water Research and Innovation Partnership (2015), H2O tapping the Potential: A Fresh Vision for UK Water Technology

<sup>12</sup> Ofwat (2019), PR19 final determinations: overview of companies’ final determinations.

Given this situation, the sector has taken steps to promote innovation. In 2020, an alliance of 19 water companies, UKWIR and Water UK published the UK 2050 Water Innovation Strategy. As well as setting out the innovation challenge, the strategy sets out four principles and seven themes that would boost innovation in the coming decades.<sup>13</sup>

In parallel to these efforts by the sector, Ofwat has taken steps to promote innovation in line with its strategy “Time to act, together”.<sup>14</sup> These include “StreamLine” (the regulatory advice service for water innovators), mechanisms and incentives included in the 2019 price review, assessing the performance of the business retail market, encouraging the new appointments and variations market (NAVs), and the Innovation Fund. In parallel, Ofwat is also encouraging the water companies and other stakeholders in the sector to consider new ways to provide and make use of open data, having published a [paper on open data](#) in October 2021.

The Innovation Fund makes available £200m to grow the water sector’s capacity to innovate, enabling it to better meet the evolving needs of customers, society and the environment. Ofwat’s intention is that the £200m Fund will be delivered by 2025. Funding is currently awarded through competitions that water companies, in partnerships with others, can enter to develop innovations that benefit customers, society and the environment. The first two years of the fund, until June 2022, are a pilot phase where Ofwat is learning and trialling different options around Fund design to optimise the impact. In April 2021, Ofwat announced the eleven winners of the £2m Innovation in Water Challenge.<sup>15</sup> In September 2021, Ofwat announced the nine winners of the £40m Water Breakthrough Challenge 1 competition.<sup>16</sup> In March 2022, Ofwat announced the thirteen winners of the £5m Breakthrough 2 Catalyst stream.<sup>17</sup> In April 2022, Ofwat announced the seven winners of the £34m Breakthrough 2 Transform stream, including four who were offered partial funding.<sup>18</sup>

The Innovation Fund will be the subject of an evaluation for which Ofwat has overall responsibility and which Challenge Works is supporting by ensuring the right framework and data collection is in place. Challenge Works’ evaluation will inform adaptations to the implementation of the Fund, inform Ofwat’s decision about a possible roll out of the Fund, and demonstrate the overall impact of the Fund and its contribution to Ofwat’s wider objectives. The evaluation is intended to be broadly consistent with UK Central Government guidance on evaluation, as set out in HM Treasury’s Magenta Book.<sup>19</sup>

### 1.3 Innovation framework

Innovation is a multifaceted and complex concept. It potentially covers a wide range of factors both within water companies but also in the wider environment. Innovation in the water sector cannot thus be easily distilled to a few quantitative indicators without the risk of losing the essence of this complexity. The challenge for this study has been to set out the main areas of interest that capture the essence of innovation in the water sector but that can also be captured in a series of indicators against which data can be gathered.

<sup>13</sup> UK 2050 Water Innovation Strategy, September 2020

<sup>14</sup> Ofwat (2019), Time to act, together: Ofwat’s strategy

<sup>15</sup> <https://www.ofwat.gov.uk/green-energy-solutions-and-cctv-leak-prevention-among-winning-water-innovations/>

<sup>16</sup> <https://www.ofwat.gov.uk/pn-28-21-hydrogen-power-from-sewage-and-clean-river-tech-win-share-of-36-million-ofwat-fund-for-cutting-edge-water-sector-innovation/>

<sup>17</sup> [PN 12/22 Ofwat’s Water Breakthrough Challenge awards £5m to accelerate tech solutions to leaks, pollution and water quality - Ofwat](#)

<sup>18</sup> [PN 16/22 Innovations to improve water efficiency, stop leaks and increase carbon capture win big in Ofwat’s Water Breakthrough Challenge - Ofwat](#)

<sup>19</sup> HM Treasury (2020), Magenta Book: Central Government guidance on evaluation.

A previous effort was made by the sector in 2013 to define indicators of innovation and collate data. The Water Sector Innovation Leadership Group (WSILG) consulted water companies, suppliers, large users, trade event organisers, environmental regulators, research councils, third sector bodies, government and representatives of investors about the most appropriate indicators to select before requesting those organisations to provide data against the indicators.<sup>20</sup> The data was collected into an on-line information tool ([www.watersectorinnovation.org](http://www.watersectorinnovation.org)), which was then intended to allow users to extract anonymised data at the sector level.

One strength of the information tool was that it offered a number of quantitative metrics, including water companies' financial expenditure on research and development and innovation disaggregated by activity area, as well as the number of patent applications, value of royalty returns, number of innovation partnerships and number of persons employed in research and development. It also aimed to capture data on innovation expenditure from regulators, suppliers, third sector organisations and large water users. However, whilst useful, such data risked offering a narrow focus on expenditure and ignoring qualitative issues such as culture, mindset, scaling up and transfer of innovations. Moreover, some challenges were reported in collecting data. For example, the water companies stated that activity area data was not available and innovation activity was often very difficult to identify and categorise. At present, it does not appear that data continues to be collected and the information tool is no longer available online.<sup>21</sup>

The approach taken for this study has been to draw on the OECD's Oslo Manual, which offers guidelines for collecting, reporting and using data on innovation from which the main areas can be drawn.<sup>22</sup> This has informed the definition of a series of innovation indicators for the water sector in England and Wales, as presented in table below. In some cases, the indicators are assessed using a quantitative metric but in most cases by an "indicator statement". The indicator metrics and statements are supported by an explanatory narrative in each case.

**Table 1 Framework of innovation indicators for the water sector**

Innovation indicators
<b>Regional water companies</b>
<p><b>Corporate commitment</b></p> <ul style="list-style-type: none"> <li>• Stated corporate commitment to innovation</li> <li>• Corporate KPIs related to innovation</li> <li>• Dedicated senior staff member(s) responsible for innovation</li> <li>• Dedicated staff resources for innovation</li> <li>• Dedicated budget for innovation</li> </ul>
<p><b>Capabilities</b></p> <ul style="list-style-type: none"> <li>• Openness and responsiveness of management to innovation</li> <li>• Innovation culture and mindset</li> </ul>
<p><b>Recent/current activities in pursuit of innovation</b></p> <ul style="list-style-type: none"> <li>• Research and development</li> <li>• Engineering, design or creative activities</li> <li>• Marketing/branding</li> <li>• Development/exploitation of new intellectual property (IP)</li> <li>• Staff training in innovation</li> <li>• Software or database development</li> </ul>

<sup>20</sup> <https://www.wrcplc.co.uk/how-innovative-is-the-uk-water-sector-help-us-find-out.aspx>

<sup>21</sup> UKWIR (2014), Indicators of Water Sector Innovation: Information Tool, Summary Report.

<sup>22</sup> OECD/Eurostat (2018), Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris/Eurostat, Luxembourg.

Innovation indicators
<ul style="list-style-type: none"> <li>Acquisition or leasing of tangible assets</li> </ul>
<b>Innovation process</b> <ul style="list-style-type: none"> <li>Scaling up innovations</li> <li>Transfer of innovations</li> </ul>
<b>Wider sector innovation ecosystem</b>
<b>Innovation collaborations between water companies</b> <ul style="list-style-type: none"> <li>Multilateral collaborations with other water companies</li> <li>Bilateral collaborations with other water companies</li> </ul>
<b>Innovation collaborations</b> <ul style="list-style-type: none"> <li>With suppliers</li> <li>With the research sector (including universities)</li> <li>With education and training providers</li> <li>With local stakeholders, e.g. local authorities, landowners</li> </ul>
<b>Policy environment</b> <ul style="list-style-type: none"> <li>Supportiveness of relevant sector regulation towards innovation</li> <li>Innovation support programmes and financing (grants, equity, debt, loan guarantees)</li> </ul>

## 1.4 Research undertaken

The innovation baseline has been completed through the following research steps.

- **Review of water companies' business plans:** the text of each business plan has provided evidence against some indicators, e.g. those relating to corporate commitment to innovation.
- **Structured interviews of water companies:** have offered more evidence about individual water companies. The interviews allowed more qualitative, nuanced and in-depth evidence to be gathered than was possible solely through the review of business plans and the on-line survey. Water companies were also invited to comment on the strengths and weaknesses of the wider innovation ecosystem.
- **Survey of regional water companies:** the regional water companies were invited to complete a short on-line questionnaire covering the company's approach to innovation and its external collaborations around innovation prior to the Innovation Fund, as well as their opinion on certain aspects of the wider innovation ecosystem for the water sector. Nine of the seventeen companies provided full responses. The quantitative responses to closed questions are presented in tables in this report, whilst the qualitative responses to open questions have informed the descriptive findings.
- **Interviews of sector stakeholders:** have offered an external perspective in relation to the indicators relating to water companies collectively. The interviews also captured evidence and opinions relating to the indicators for the wider sector innovation ecosystem.
- **External data analysis:** evidence in relation to some issues was gathered from external published sources, for example, relating to the sector-level efforts to promote innovation.
- **Analysis:** evidence from all sources has enabled a set of "indicator statements" to be made. These have required a best judgement to be made by the research team based on the weight of evidence.

The main research tools used by the study are provided in an annex, which will allow them to be used in any future study of the state of innovation in the sector, e.g. in 2025, after implementation of the Innovation Fund.

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## 2. Water companies' capacity for and approaches to innovation

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Given that the sector is characterised by a relatively small number of water companies, any assessment of the sector's innovation baseline will have to look quite closely at those individual water companies. This section therefore provides a summary assessment of the capacity for innovation and approaches to innovation of the water companies regulated by Ofwat. The intention here has not been to assess performance or to measure the water companies against some kind of "standard" to which they should comply. The aim has simply been to describe the baseline situation, in order to facilitate a later assessment of the impacts of the Fund.

In assessing capacity for and approaches to innovation, it is also important to avoid suggesting that there is one single specific corporate "model" of innovation that all water companies should adopt. Indeed, the water companies regulated by Ofwat differ substantially both in terms of the geographies that they serve, as well as in their size, structure and business culture. This difference is inevitably reflected in their approach to innovation. The approach taken in this section is therefore to consider how the main innovation indicators play out in the different water companies.

### 2.1 Corporate commitment to innovation

#### 2.1.1 Business plans and strategies

In the previous price review period (PR14), Ofwat promoted the inclusion of innovation as a general principle to be taken into account in water companies' business plans. Ofwat's requirements for PR19 went further, requiring companies to specifically state in their business plans how they would build on and develop innovations amid rising consumer expectations, technological advances and environmental challenges. As stated by Ofwat in the methodology for PR19:

"Innovation must be at the core of every company to deliver long-term resilience, great customer service and affordability. We expect companies to look beyond their boundaries in addressing the challenges they face. New markets such as direct procurement for customers for large infrastructure projects, the water resource and bioresource markets and markets for eco-services all offer companies scope for greater innovation and more effective co-operation with third parties to deliver for customers. We will assess how innovative companies' plans are. Companies with the most innovative and ambitious plans delivering real benefits for customers and raising the bar for others will receive an additional return. This is in recognition of the additional effort and risk they will have taken preparing their plans".<sup>23</sup>

**Innovation is presented as a prominent and explicit high-level objective in most water companies' business plans for the 2019 price review (PR19), which covered the years 2020 to 2025.** Indeed, water companies across England and Wales recognise that the adoption of innovative approaches in the sector is key to delivering reliable, resilient and safe water at an affordable price and to addressing challenges such as climate change and increased demand resulting from population growth.

**Nearly all business plans feature a section dedicated to innovation, which sets out a comprehensive and strategic approach.** The level of corporate commitment to innovation can be illustrated through high-level objectives for the coming years, and dedicated sections on innovation, with water companies stressing the need for an innovative approach to underpin how services are delivered. For example:

- United Utilities' business plan features a section dedicated to "Using markets and innovation", which sets out a comprehensive innovation strategy. The strategy includes different dimensions,

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<sup>23</sup> Ofwat (2017), Delivering Water 2020: Our final methodology for the 2019 price review

namely “Accessing the innovation eco-system”, “Strategic innovation”, “Breakthrough innovation”, “Inspiring an innovation culture”, and “Academia and leveraged funding”. It also sets out the key elements of the innovation process, namely: “Focus, Explore, Design, Develop, Deliver, Learn”.

- Bristol Water’s business plan presents innovation as a fourth theme complementing the three Ofwat themes of “customer service”, “resilience” and “affordability”. Innovation is mainstreamed throughout the document, as well as being the subject of a dedicated sub-section which sets out the role of the Business Improvement and Innovation team and “Innovation Champions” within the business. Previous and planned innovation activities are mapped onto customer priorities and customer priorities, thus showing how innovation relates to broader strategic objectives.
- Welsh Water’s (Dŵr Cymru) business plan features a separate Innovation Strategy, which aims to support the delivery of Welsh Water 2050 and its mission “to become a truly world class, resilient and sustainable water service for the benefit of future generations”. Underpinning this strategy are 18 journey plans, which offer an in-depth look at the knowledge outcomes they need to deliver to meet the aims of Welsh Water 2050.

**Most business plan do not feature Key Performance Indicators (KPIs) specifically related to innovation.** It is perhaps unnecessary for the business plans to have KPIs related to innovation, given that innovation is a means to raise overall performance. Reflecting this, the water companies generally have KPIs linked to regulatory compliance rather than innovation as such. For example, several of the business plans reviewed contain indicators related to leakage reduction, service failure reduction, the environment and efficient use of water. These objectives are expected of water companies and, although there is an innovation dimension, they are not necessarily directly linked. However, there is a broad understanding among water companies that they need to innovate to deliver outcomes. Indeed, one interviewee confirmed that all of their KPIs relate to innovation and they need to innovate to meet outcomes. Examples of water companies that include innovation-specific KPIs include:

- Northumbrian Water’s business plan contains metrics, targets and measurements around innovation, including conversion rate and impact on ODI.
- Yorkshire Water measures R&D innovation through a series of metrics, such as “return on investment (RoI)”.

**There are instances of NAVs with a strong corporate commitment to innovation.** For example, Albion Water demonstrates a commitment to identifying new and innovative solutions for new sites falling under its remit. However, the situation is less certain for other NAVs, given that not all the NAVs publish their business plans.

**Table 2 Indicators: business plans and strategies**

Indicator	Number of companies
<b>Does innovation feature within the high-level objectives stated in the business plan?</b>	
• Yes – prominent and explicit	11/17
• Yes – present but not prominent	4/17
• Partially – e.g. implied	2/17
• Not at all	0/17
<b>Does the business plan feature a section dedicated to innovation?</b>	



Indicator	Number of companies
• Dedicated section - featuring a comprehensive and strategic approach	13/17
• Dedicated section - featuring a few ad hoc activities	3/17
• Not a dedicated section – but elements of innovation feature in other sections	1/17
• Not at all	0/17
<b>Does the business plan feature Key Performance Indicators (KPIs) directly linked to innovation?</b>	
• Yes – comprehensive and high-level	3/17
• Yes – a few but not high-level	2/17
• Partially – e.g. implied in other indicators	7/17
• Not at all	5/17

*NB: not including the new appointments and variations.*

**Table 3 Indicator statements: business plans and strategies**

Business plans and strategies
<ul style="list-style-type: none"> <li>• The majority of the regional water companies (11/17) have prominent and explicit high-level objectives related to innovation, with innovation a prominent theme throughout business plans and strategies, whilst most of the others (4/17) have objectives that feature innovation, albeit not prominently.</li> <li>• The business plans generally present approaches to innovation in a clear and explicit manner, with several having dedicated chapters and/or appendices providing further insight, including the processes by which they innovate, as well as case studies of specific innovations. However, this is not the case with all business plans.</li> <li>• The approach to innovation supports how the water companies operate as they look to deliver benefits for customers and the environment, building on previous progress made. While supportive, innovation is not necessarily central to all operations.</li> <li>• NAVs tend not to publish business plans. As such, their commitment to innovation is not always set out clearly and publicly.</li> <li>• Most water companies have KPIs linked to wider objectives, e.g. leakage reduction, customer service. In a couple of instances, the KPIs are directly linked to innovation. However, in most cases, they have an innovation dimension but are not directly linked.</li> <li>• Both the business plans and interview feedback have provided evidence of a high level of corporate commitment to innovation prior to the Innovation Fund.</li> </ul>

### 2.1.2 Commitment of staff and resources

The water companies take quite different approaches to the allocation of staff and resources to innovation, reflecting not only their different sizes and circumstances but also their overall approach to the promotion of innovation. As a result, the number of staff as well as the budget allocated to innovation varies across the sector. However these figures should be considered in the context of the size of the water company and the population they serve. Two main approaches to the commitment of staff and resources can be identified.

**First, some water companies approach innovation as a distinct corporate function.** To this end, most of the large water companies have senior staff responsible for innovation, as well as dedicated innovation units or managers. Indeed, 8 of the 10 companies responding to the survey reported that the company had a dedicated unit and 7 out of 9 had a dedicated innovation budget. Budgets varied

## 2. Water companies' capacity for and approaches to innovation

from £130k p.a. to £3m p.a. to £61m over the 5-year AMP7 period. In one company, some 140 people were employed in the innovation unit, suggesting it had a very broad remit (e.g. encompassing research and development). In other companies, the number of dedicated innovation staff was between 4 and 13. For example:

- Thames Water has a Digital Transformation Director who is supported by an innovation team of around 35 people. The recent launch of the 'One Thames' operating model created a single owner for innovation which illustrates the increasing importance of innovation to their provision of reliable, resilient and safe water services. Activities are supported by a budget of around £10 million per year, though feedback indicated that this figure could be higher due to additional activities taking place outside the team.
- Northumbrian Water has an innovation team of 7 members in addition to 75 "Innovation Ambassadors" across the company.
- Anglian Water has an innovation team of 7 as well as an Innovation Discovery team comprised of 5 people, which manages academic research partnerships and more traditional R&D activities.
- Severn Trent Water has an asset intelligence and innovation team as well as 60 other staff members responsible for innovation.
- United Utilities has a board member responsible for Environment, Planning and Innovation, as well as a dedicated innovation team.

**Second, some medium-sized water companies have small innovation teams dedicated to innovation, as well as more staff for whom innovation is part of their work.** Examples include:

- Wessex Water has two members of staff dedicated to innovation. However there are dozens of other personnel involved in innovative activities in some way, even if innovation does not constitute part of their job title.
- Welsh Water has individual teams responsible for innovation, such as the customer service team and retail team. Interview feedback highlighted that innovation is part of the overarching business strategy and heads of service are responsible for driving innovation in their respective fields.

**Third, some small water companies prioritise mainstreaming innovation into most or all activities, as part of the company ethos, culture and mindset, rather than as a dedicated function in its own right.** The smaller water companies naturally have less scope to appoint staff and teams solely dedicated to innovation and are therefore more reliant on the promotion of an innovation mindset. This does not necessarily make them less innovative than much larger water companies with dedicated teams. However, it does necessitate them to be very selective when it comes to investing in major innovations, compared with larger companies that might have dedicated budgets for innovation.

**The different approaches to committing staff and resources raise different opportunities but also challenges regarding the promotion of innovation within water companies.** Where innovation is a dedicated function (with its own staff and budgets), there is a need for it to be connected into all parts of the company so that any innovations that are developed or sourced are, firstly, relevant to business needs and, secondly, exploited as necessary (i.e. incorporated into operations or processes or practices, etc.). Where companies do not have a dedicated innovation team, it can be effective to mainstream innovation into most or all activities, provided that innovation does not get overlooked in the face of competing priorities.

**Table 4 Survey evidence: commitment of staff and resources**

Indicator	Number of companies
<b>Prior to the Innovation Fund, did a named board member have responsibility for innovation?</b>	
• Yes – board member solely dedicated to innovation	0
• Yes – included in board member job title (but not solely innovation)	5
• No – but a named senior manager was responsible for innovation (below board level)	5
• No – there was no nominated board member or senior manager responsible for innovation	0
<b>Prior to the Innovation Fund, what staff were dedicated to innovation (in August 2020)?</b>	
• Dedicated innovation unit	8
• Dedicated innovation manager (full-time for innovation)	0
• Nominated innovation manager (combined with other roles)	2
• No nominated innovation staff	0
<b>Prior to the Innovation Fund, what budgetary resources were dedicated to innovation (in August 2020)?</b>	
• Dedicated innovation budget	7
• Innovation explicitly included in a broader budget	1
• Ad hoc items of innovation expenditure	1
• No dedicated budgetary resources	0

Source: survey of regional water companies (not including NAVs)

**Table 5 Indicators: commitment of staff and resources**

Indicator	Number of companies
<b>Does a named board member or senior staff member currently have responsibility for innovation?</b>	
• Yes – board member solely dedicated to innovation	0/17
• Yes – included in board member job title (but not solely innovation)	4/17
• Partial – named senior manager responsible for innovation (below board level)	11/17
• Not at all	1/17
• Not known	1/17
<b>What staff are dedicated to innovation?</b>	
• Dedicated innovation unit	8/17
• Dedicated innovation manager (full-time for innovation)	5/17
• Nominated innovation manager (combined with other roles)	2/17
• No nominated innovation staff	1/17
• Not clear	1/17
<b>What budgetary resources are dedicated to innovation?</b>	
• Dedicated innovation budget	9/17
• Innovation explicitly included in a broader budget	5/17
• Ad hoc items of innovation expenditure	3/17
• No dedicated budgetary resources	0/17

Source: review of business plans and interviews of regional water companies (not including NAVs)

**Table 6 Indicator statements: commitment of staff and resources**

Commitment of staff and resources
<ul style="list-style-type: none"> <li>• In nearly all water companies, a named individual is responsible for leading innovation. This is most often a senior manager, although in a few cases a board member is nominated to lead innovation as part of a wider role.</li> <li>• The budget allocated to innovation varies across the sector but most water companies have a dedicated annual budget. In some cases, additional funding for innovation is available outside of the dedicated innovation teams.</li> <li>• The number of staff and budget allocated to innovation is generally related to the size of the water company. As such, smaller water companies naturally have smaller dedicated budgets for innovation, which requires them to be selective.</li> <li>• The staff and budget allocated to innovation support the water companies' stances on innovation outlined in their business plans. However, there is often limited clarity around the exact number of staff and the size of budgets committed to innovation.</li> <li>• Where innovation is a dedicated function (with its own staff and budgets), it is most effective where it is connected into all parts of the water company so that any innovations that are developed or sourced are, firstly, relevant to business needs and, secondly, exploited as necessary.</li> <li>• Where innovation is mainstreamed across the water company, rather than being a dedicated corporate function, it is most effective where definite actions are taken to ensure that innovation is prioritised in the face of competing priorities.</li> </ul>

### 2.1.3 Innovation culture and mindset

An innovation culture and mindset fostered throughout the water companies is a good indication of how the objectives highlighted in business strategies can be implemented throughout the wider business. For instance, this can be manifested by the attitudes of the senior management towards embracing innovative approaches, or the extent to which employees have adopted an innovative mindset in their daily work. The research for this study has shown that most of the companies in the water sector take steps to foster an innovative culture, through being open to new ideas and supportive of an environment in which personnel are empowered to innovate and encouraged to share ideas.

**Most, if not all, water companies take steps to promote broad awareness of innovation across the company.** United Utilities operates "Innovation 100", an awareness-raising initiative, which involves regular consultations of staff regarding innovation and soliciting their ideas with each consultation reaching 100 staff members. At Wessex Water, there is vocal encouragement from the leadership, as seen in cross-company communications and the showcasing of projects. South East Water has an 'Insight Hub' where employees can log the insights they gain through data, intelligence and engagement, and use it to support the company's plans. As stressed by the company, this approach is innovative in itself and will encourage the sharing of ideas and solutions. Thames Water's Net Promoter System gives the company a methodical way to capture all employee feedback and ideas about what the company should do differently.

**Linked to this, there are instances of the leadership of water companies (e.g. Chief Executives or other board members) proactively promoting innovation to all staff.** For instance, the leadership of Severn Trent Water has promoted a culture of 'anyone can innovate', where all employees were briefed in person about the customer culture and service changes the company wanted to make. The intention is to allow for new approaches to be developed and, importantly, mistakes to be made from

which all can learn constructively. The Chief Executive is actively involved, having met with over 5,500 people at 64 roadshows. Similarly, the Chief Executive of Northumbrian Water is actively engaged in innovation and often speaks about the subject at public events. In the case of Southern Water, the Commercial and Innovation Director is the company-wide sponsor for innovation, while at SES Water, in 2017 the Non-Executive Chairman took the lead in championing innovation in how the company operates.

**Some water companies have a specific and structured process for soliciting innovation proposals from their workforce and taking forward the most promising ones.** These go beyond mere "employee suggestion schemes". Key features of such processes are a specific focus on innovation (rather than just good ideas), an openness to all staff, wide promotion across the firm and a structured approach to taking forward - and financing - suitable proposals. They include:

- Welsh Water operates an "iLab" innovation process, which, amongst other things, solicits innovative proposals from staff. The process includes an annual innovation conference to solicit ideas and enable staff to engage with external partners around innovation. The iLab meets every three months to review progress in implementing proposals and report to the board.
- Portsmouth Water invites all staff to submit a business case for innovations following a standard approach, which considers stakeholders, business impacts, customer benefits and efficiency gains. The company's Business Improvement Group prioritises the most promising proposals, monitors their implementation and reports to the board at regular intervals.
- Wessex Water operates innovation challenges for staff to submit proposals that respond to specific issues. The most relevant proposals are taken forward and scaled up, if effective.
- Northumbrian Water operates an "IdeasBase", an internal on-line platform which enables staff to put forward innovation proposals. The platform is used to promote specific challenges. Any promising proposals are tested via "InvestQuest", a Dragon's Den-style competition, with the most promising being taken forward with specific funding.
- South West Water has an "Open ideation platform", where staff can discuss and develop new ideas around specific challenge-led campaigns. The platform also benefits from being accessible to selected external partners, such as suppliers or water companies in other countries.

**Some water companies have specifically trained senior staff in innovation.** Here the intention is to embed an innovative mindset at senior level and, through that, support a broader culture of change across the workforce. It can also help staff to understand how the innovation process can work, in terms of stimulating new thinking, piloting ways to test new knowledge, processes, techniques or technologies, assessing success and rolling out effective solutions. Examples include:

- Northumbrian Water has made innovation central to its leadership development programme, and also developed an "intrepreneurship" programme of coaching and mentoring. This aims to help staff to be commercial in the development of their business cases and creative in leveraging external funding and support.
- Southern Water has provided "Innovation Leadership Workshops" to equip the executive team with the core concepts of innovation and the tools and language to provide productive and insightful leadership.

Overall, the innovation culture and mindset fostered throughout the sector is supportive of the objectives outlined in the business plans and, added to the staff and budget allocated to innovation, illustrates a level of corporate commitment to innovation. However, feedback has suggested that the level of innovation culture and mindset varies across the sector and within water companies. As such, there remains scope to improve the level of maturity across the sector.

**Table 7 Survey evidence: innovation culture and mindset**

Survey questions and response options	Responses
<b>Prior to the Innovation Fund, to what extent did the management display an openness and responsiveness to innovation?</b>	
<ul style="list-style-type: none"> <li>Board/senior management actively and consistently canvass, listen to and adopt innovative ideas and approaches</li> </ul>	7
<ul style="list-style-type: none"> <li>Board/senior management occasionally canvass, listen to and adopt innovative ideas and approaches</li> </ul>	2
<ul style="list-style-type: none"> <li>Ad hoc instances of board/senior management responding to innovative ideas and approaches, but in quite a passive way</li> </ul>	0
<ul style="list-style-type: none"> <li>Little/no evidence of management being open to innovations</li> </ul>	0
<b>Prior to the Innovation Fund, to what extent was an innovative mindset fostered in the overall workforce (beyond those directly responsible for innovation)?</b>	
<ul style="list-style-type: none"> <li>Comprehensive approach to fostering an innovative mindset amongst all staff</li> </ul>	3
<ul style="list-style-type: none"> <li>Innovative mindset consistently fostered amongst a (significant) subset of the workforce</li> </ul>	4
<ul style="list-style-type: none"> <li>Ad hoc instances of fostering an innovative mindset amongst staff</li> </ul>	2
<ul style="list-style-type: none"> <li>No particular effort to foster an innovative mindset amongst staff</li> </ul>	0

Source: survey of regional water companies (not including NAVs)

**Table 8 Indicators: innovation culture and mindset**

Indicator	Number of water companies
<b>To what extent is a structured and systematic process in place to promote innovation within the firm, engage staff, solicit ideas and take forward innovative proposals?</b>	
<ul style="list-style-type: none"> <li>A systematic and structured process is in place to solicit and take forward innovative ideas and approaches</li> </ul>	7/17
<ul style="list-style-type: none"> <li>An open approach that encourages staff to bring forward innovative proposals for consideration at senior level.</li> </ul>	9/17
<ul style="list-style-type: none"> <li>Ad hoc instances of board/senior management responding to innovative ideas and approaches, but in quite a passive way.</li> </ul>	0/17
<ul style="list-style-type: none"> <li>Little/no evidence of management actively soliciting and taking forward innovative proposals from staff.</li> </ul>	0/17
<ul style="list-style-type: none"> <li>Not known</li> </ul>	1/17
<b>To what extent is an innovative mindset fostered in the overall workforce (beyond those directly responsible for innovation)?</b>	
<ul style="list-style-type: none"> <li>Comprehensive approach to fostering an innovative mindset amongst all staff</li> </ul>	6/17
<ul style="list-style-type: none"> <li>Innovative mindset consistently fostered amongst a (significant) subset of the workforce</li> </ul>	8/17
<ul style="list-style-type: none"> <li>Ad hoc instances of fostering an innovative mindset amongst staff</li> </ul>	2/17

Indicator	Number of water companies
• No particular effort to foster an innovative mindset amongst staff	0/17
• Not known	1/17

Source: review of business plans and interviews of regional water companies (not including NAVs)

**Table 9 Indicator statements: innovation culture and mindset**

Innovation culture and mindset
<ul style="list-style-type: none"> <li>• The majority of the water companies' senior management display a high level of openness and responsiveness to innovation, actively promoting innovative approaches throughout the workforce.</li> <li>• Senior managers actively engage with board members on a regular basis, ensuring the flow of innovative ideas across water companies.</li> <li>• In the majority of cases, employees are encouraged to generate ideas, collaborate, take risks and implement innovation in their functions.</li> <li>• Some water companies have a specific and structured process for soliciting innovation proposals from their workforce and taking forward the most promising ones.</li> <li>• Some water companies have specifically trained senior staff in innovation.</li> <li>• Overall, increasing efforts have been made in recent years to strengthen the sector's innovation culture and mindset. However, it varies across the sector and within water companies.</li> </ul>

## 2.2 The innovation process

### 2.2.1 Innovation activities

This sub-section presents a selection of innovation activities. The projects developed by water companies are aligned with the objectives in their business strategies and demonstrate a continued commitment to innovation in the sector. They are far from being exhaustive but they illustrate how water companies view innovation and the creative ways they develop solutions to current challenges.

**Water companies across England and Wales have undertaken a number of innovation activities across various areas** as they look to improve customer service, meet environmental challenges and engage with the wider community. Companies are not only financing R&D activities and enhancing infrastructure to support the supply of water but also adopting new solutions in the data field, taking advantage of burgeoning technologies such as artificial intelligence to implement efficiencies in the sector, such as saving water and reducing repair times. In addition, companies are actively engaging with the public and providing staff training to raise awareness of the benefits of innovating in bringing about secure, affordable water supplies.

In the field of **research and development**, a variety of projects have been implemented by the water companies, often in partnership with academia. For instance:

- Northumbrian Water's Innovation Street uses real homes to test and demonstrate novel products and services in an approach using scientific research where customers are engaged in the design. Water and wastewater services are among the challenges considered under Innovation Street, which aims to reduce bills and minimise the impact on the environment.
- Welsh Water funds and works with the Great Western 4 (GW4) universities on research and technology development, supporting Welsh Water 2050. It is currently working with Cardiff



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University to test cryptosporidium contamination of drinking water using a combination of Next Generation Sequencing techniques.

- Southern Water is engaged in R&D to eliminate microplastics found in marine environments from its wastewater treatment plants. Additionally, it was the first UK water company to sponsor a Microplastics PhD.
- Thames Water has undertaken innovation activities to foster a resilient water supply. It has investigated options of using wastewater to support water resources and help tackle the shortage of water supply, including indirect potable reuse, non-potable reuse and environmental flow augmentation. A closed cycle of water use removes the need to pump it around the systems, reducing energy and stress on the asset base.

**Engineering and infrastructure** has traditionally been an area for innovation in water companies, which has evolved over the years. Flooding has been a major issue in recent years and companies have developed innovative solutions to reduce its impact. Companies are also taking advantage of technological developments to innovate further and deliver enhanced solutions for customers.

- Welsh Water's Greener Grangetown maximises the use of green infrastructure to remove 483 roof equivalents of rainwater from sewers annually and to futureproof the drainage network against climate change.
- South West Water has a water distribution network training centre at its Pynes Water Treatment Works. It is a model rig designed for training and testing asset technologies, network performance and operations. Additionally, the company's Mayflower Water Treatment Works is the first of its kind in the world, using cutting-edge treatment processes designed to produce high quality drinking water and to be more sustainable than a traditional water treatment works.
- Portsmouth Water installs a wall mounted meter box on all new properties, which will reduce long term costs to consumers and facilitates the identification and repair of leaks. The company decided to innovate in this area and adopt the customers' supply pipe where a box has been installed, removing any maintenance concerns.
- United Utilities has installed Nereda, a wastewater treatment technology, at its plants. The company was the first to trial the aerobic granular sludge technology, which is cost effective and has lower energy usage.

Some water companies have engaged in innovative **public engagement activities and campaigns** in recent years, working with local communities on issues such as water consumption, education and the environment. For instance:

- Northumbrian Water works with communities and partners through Rainwise to manage the quantity of surface water which enters the sewers network. The initiative aims to reduce the risk of sewer flooding and protect the environment from pollution. Northumbrian Water involves residents in the planning stages to co-create innovative solutions, including through the use of its community engagement vehicle 'Flo' and its online Community Portal.
- Severn Trent Water's 'voice of the customer' tool provides them with instant feedback, while Tap Chat allows them to explore new ideas with over 15,000 customers. The company uses a dedicated software package to manage its innovation portfolio.
- Anglian Water has engaged with 16,000 customers through a behavioural change campaign to reduce water consumption, as part of the Shop Window.
- Similarly, South East Water was the first UK water company to undertake behavioural science-based trials to influence customer demand for water. Over several pilots, some of which engaged up to 20,000 customers, the company examined the effect of social norming to influence customers' behaviour. Due to the trial's success, South East Water has set ambitious targets for

per capita consumption reduction.

- South West Water has made new use of social media to engage with customers, including through online tools to promote the company, as well as short films for television. The company noted that this was previously not an area it had a notable presence in, and constitutes part of a broader campaign to innovate in the way it communicates with customers. Education is also an aspect of customer engagement.
- SES Water has a purpose-built education centre at Bough Beech Reservoir and Treatment Works, which opened in 1999. Nearly 50,000 people have learned more about the link between their water supplies and the wider environment.

Water companies are increasingly using **software and data** to innovate, and there are numerous examples. For example:

- Northumbrian Water has developed UTILEYES, an app that enables customers to live stream their issue, meaning issues can be resolved faster and reducing the number of visits required. The company held a hackathon, #PUMPED, where open data was used to create a system for predicting failures at pumping stations to reduce the number of times sewage escapes from the network causing pollution.
- South Staffs Water utilises live distribution network technologies to provide real-time data on the performance of the network, reducing customer service disruption.
- Southern Water uses speech analytics software in its call centres to proactively resolve issues.
- South East Water was an early adopter of innovation around leakage, focusing on leakage monitoring techniques to reduce pressure and prevent and find leaks. The company created innovative in-house solutions to leakage data management and established its own platform, Aquanet.
- Severn Trent Water, working with a partner in advanced analytics, has created a model that uses 24 algorithms and 2.7 billion rows of existing operational data to identify pipe characteristics leading to leaks. The trial was able to reduce leakage detection time by around 70%.
- Wessex Water uses Machine Learning to analyse data generated by sensors during storm overflows.

Ofwat has explicitly encouraged companies to finding new ways to provide and make use of **open data**. To this end, Ofwat published a first discussion paper about open data in the sector in October 2021.<sup>24</sup> The paper outlines Ofwat's views on how water companies can use open data and is intended to stimulate a public discussion about how open data could be used to help address some of the challenges the sector faces. Ofwat has highlighted examples of water companies using open data, such as sharing asset registers or performance data, or organising activities such as hackathons.<sup>25</sup> In this context, other examples of companies using data include:

- Yorkshire Water is proposing a new use of open data in the context of innovation. This will take the form of an [open data approach](#) that will allow independent data scientists in Yorkshire secure access to the company's data streams. The intention is that digital developers will find innovative solutions to problems such as pollution and leakage.
- Northumbrian Water organised a hackathon where open data was used by competing teams of data scientists to create a system for predicting failures at pumping stations to reduce the number of times sewage escapes from the network causing pollution.

<sup>24</sup> <https://www.ofwat.gov.uk/regulated-companies/open-data-in-the-water-industry/>

<sup>25</sup> [https://www.ofwat.gov.uk/wp-content/uploads/2021/10/Case-study-appendix\\_.pdf](https://www.ofwat.gov.uk/wp-content/uploads/2021/10/Case-study-appendix_.pdf)

**Table 10 Indicator statements: innovation activities**

Innovation activities
<ul style="list-style-type: none"> <li>• Water companies have undertaken a number of innovation activities in recent years to improve customer service and meet environmental challenges.</li> <li>• A wide array of innovation activities has taken place, from traditional fields such as R&amp;D and engineering, to new areas such as digital technologies facilitating customer engagement and data analysis.</li> <li>• The array of innovation activities illustrates how water companies view innovation as a concept and the creative ways they develop solutions.</li> <li>• Water companies are increasingly using new technologies such as artificial intelligence, reflecting wider societal trends.</li> <li>• The number and scale of innovation activities developed varies across water companies, which can be attributed to the resources at their disposal as well as the maturity of innovation across the water companies.</li> </ul>

### 2.2.2 Scaling up innovations

The trialling and rolling out of innovations can be considered an indication of a company's capacity to initiate and implement innovative solutions across the company. Seven of the nine companies responding to the survey reported that they had a structured process or regular practice of rolling out innovations, whilst eight out of nine believed that companies in general did (to a great or reasonable extent). However, it should be noted that the degree of innovation in a water company is not necessarily contingent upon the number of successful solutions rolled out, as they can be at trial stage, can be procured or companies may have different innovation objectives due to the resources available and focus their attention on the innovations which are likely to bring the most added value. Indeed, interview feedback has highlighted that additional funding would be required to develop such activities further, which might suggest a role for the Innovation Fund. While there are instances of water companies having rolled out successful solutions, these should be considered with the wider innovation activities water companies are undertaking.

**A number of successful trials have been rolled out across water companies.** For example, Southern Water recently undertook trials in the Rownhams water supply zone involving 100 water quality and leakage sensors. The company is now aiming to roll out the solution to provide a truly smart network which will manage itself and believes it will be the norm for all UK water networks. Thames Water has rolled out Mecana filters to remove algae and has demonstrated that meters are able to identify bursts, pump trips and abnormal reservoir patterns. Welsh Water has rolled out filters which remove manganese. The trials worked and they have been implemented at water works.

Severn Trent Water implemented a dynamic risk prediction tool to use in sewage pumping stations six months ago and the operations team now use it daily to investigate and understand risks. Another example is a solution piloted by Northumbrian Water in Sunderland which mapped utilities pipes underground, based on data. It was then piloted across the North East and has since been adopted by the Cabinet Office as a national platform. Meanwhile, Wessex Water undertook a trial to ascertain how machine learning can be used to analyse data generated by sensors during storm overflows. It collaborated with StormHarvester and the solution is now being rolled out. Other innovations that have been rolled out in the sector include the use of satellite imagery and drones for the detection of leaks, the removal of phosphorous from wastewater and the use of acoustic signatures to assess network conditions.

**Some water companies have developed very structured ways of tracking innovations across the company, which facilitates the capturing of results company-wide and the scaling up of innovations.**

The testing of new technologies, techniques, etc. is of course part of the normal cycle of operations within the water sector, given the central importance of engineering and infrastructure. However, some water companies have gone beyond this to track the innovation process itself, in order to capture evidence, identify future needs and opportunities and learn lessons. Examples include:

- Yorkshire Water's "Open Innovation Playbook" sets out four types of open innovation that will be used across the company: consortium; community; in-house research and development; competition. The aim is to clearly set out what type of innovation approach fits the problem or solution requirements best. In this way, the company intends that staff will understand when and how to utilise in-house capability, engage the supply chain and seek support from elsewhere. The Open Innovation Playbook is supported by a transformation community, which brings together key staff to discuss how to develop and exploit potential innovations.
- Southern Water has an "Innovation Database", which captures some +500 innovations, including results from technology trials and assessments, and insight from conferences and supplier presentations. The database informs monthly meetings with multi-disciplinary teams to track, discuss and assess all technical innovations across the business.

**Table 11 Survey evidence: scaling up innovations**

Survey questions and response options	Responses
<b>Prior to the Innovation Fund, were successful pilot innovations rolled-out across the company?</b>	
• Yes – structured process or regular practice of rolling out pilots across the company	7
• Yes – one or more ad hoc instances of pilots rolled out across the company	2
• Partial – ideas, learning or elements of pilots rolled out across the company	0
• No	0
<b>Prior to the Innovation Fund, to what extent were regional water companies effectively piloting and rolling out innovations within the same company?</b>	
• To a great extent	1
• To a reasonable extent	6
• To a slight extent	1
• Not at all	0
• Don't know	1

Source: survey of regional water companies (not including NAVs)

**Table 12 Indicator statements: scaling up innovations**

Scaling up innovations
<ul style="list-style-type: none"> <li>• There are a number of examples of innovative solutions which have been trialled and rolled out across water companies, including around improving the resilience of networks.</li> <li>• The degree of scaling up varies by water company, which should be considered in the context of the innovation objectives and the resources available.</li> <li>• There is a degree of risk in trialling solutions which may explain preferences for adopting market-ready solutions.</li> <li>• Some water companies have developed very structured ways of tracking innovations across the company.</li> </ul>

### Scaling up innovations

- The scaling up of innovations should not be considered in isolation, rather it should be considered with the wider innovation activities taking place within water companies to provide a clearer picture of the level of innovation.

### 2.2.3 Transfer of innovations

Water companies may seek to implement innovative solutions by adopting those tested by other companies in the sector. For example, Northumbrian Water adopted the use of ice pigging developed by Bristol Water. Four of the nine companies responding to the survey reported that they had a structured process or regular practice of adopting innovations from other companies, whilst four also believed that companies in general did (to a great or reasonable extent). This demonstrates not only a capacity to embrace successful solutions already utilised in the sector, but also sheds light on the level of collaboration between water companies in a competitive industry. However, two challenges are faced in the transfer of innovation.

#### **The different geographies served by the water companies can hinder the transfer of innovation.**

Whilst the water companies face the same broad challenges in terms of reducing leakage, ensuring water quality, minimising interruptions, and limiting environmental impact, etc., there is considerable variation in the way that these challenges play out in different places. This variation means that innovations that prove successful in one area do not necessarily transfer successfully to another area, for example, due to differences in the geology of water companies' areas. Whilst water companies have shared experience on a bilateral basis through formal or informal networks, the sector suffered from a lack of co-ordination on such issues, prior to the Innovation Fund. In this context, the creation of the [Spring Centre Of Excellence](#) (with initial support from the Fund) offers the potential to fill this gap, not least through its "communities of knowledge".

#### **Water companies may often be unaware of which innovations have been successfully tested and rolled out elsewhere.**

The diversity of suppliers and their products (see section 3.2.1) is beneficial but not without its difficulties. Water companies report that it can often be challenging to ascertain which solutions are already utilised since suppliers do not always provide such information. Additionally, technologies adopted may have undergone trials at another water company at an earlier stage. Water companies may be looking at solutions in parallel, thus the same solutions may be adopted by more than one company. This suggests the need for better sharing of experience of specific innovations in a co-ordinated way at the sector level. Again, Spring offers the potential to fill this gap through the communities of knowledge, whilst the Innovation Fund might offer potential to fund the transfer of innovations.

Overall, the evidence suggests that, despite the many innovative activities taking place in the sector, there is a need for further efforts to facilitate and increase the scale of transfer of innovations.

**Table 13 Survey evidence: transfer of innovations**

Survey questions and response options	Responses
<b>Prior to the Innovation Fund, had innovations/ innovative projects from other water companies been adopted and rolled-out?</b>	
• Yes – structured process or regular practice of adopting innovations from other companies	4
• Yes – one or more ad hoc instances of adopting innovations from other companies	5
• Partial – ideas, learning or elements of innovation adopted from other companies	0
• No	0

Survey questions and response options	Responses
<b>Prior to the Innovation Fund, to what extent were regional water companies effectively adopting innovations from other water companies?</b>	
• To a great extent	0
• To a reasonable extent	4
• To a slight extent	5
• Not at all	0
• Don't know	0

Source: survey of regional water companies (not including NAVs)

**Table 14 Indicator statements: transfer of innovations**

Transfer of innovations
<ul style="list-style-type: none"> <li>• There have been instances of water companies adopting solutions from others in the water sector.</li> <li>• However, it is often unclear whether the solutions have been adopted from other water companies as suppliers do not always provide such information.</li> <li>• Overall, the evidence suggests that there is scope for more co-ordination at sector level to promote the transfer of innovations. This could be focussed both on tackling shared problems as well as specific technologies. The communities of knowledge operated by Spring offer the potential to fill this gap.</li> </ul>

## 3. Innovation ecosystem

For the full benefits of innovation to be realised, there is a need for water companies not only to undertake their own innovation activities but also to engage with the wider innovation “ecosystem” of multiple and interconnected stakeholders, including other water companies, sector-level bodies, suppliers, universities and research bodies, regulators, national and local government, and communities. All these stakeholders have the potential either to contribute to innovation or to hinder it. Moreover, the nature, scale and quality of the relationships and interactions between these different stakeholders can be crucial to enabling water companies to innovate effectively. To that end, the PR19 process required water companies to look beyond their boundaries in addressing the challenges they face and develop more effective co-operation with third parties to deliver for customers.<sup>26</sup> This section therefore offers evidence regarding the baseline situation of the innovation ecosystem for the water sector.

### 3.1 Water company collaborations

#### 3.1.1 Sector-level collaborations

Given that the water sector is characterised by a small number of water companies, a certain level of networking and sector-level collaboration already existed to address common problems and promote sector interests. Indeed, eight out of nine companies responding to the on-line survey reported either extensive, structured and long-term, or at least regular, multilateral collaboration or engagement with sector-wide innovation initiatives. However, the regulatory system of comparing companies and ranking them at price reviews risks driving an artificial form of competition that might tend to reduce openness to information-sharing collaboration. In this context, the evidence suggests some scope to increase sector-level collaboration around innovation.

**A significant resource informing sector-level collaboration is offered in the form of UK Water Industry Research (UKWIR).** UKWIR undertakes research into all aspects of the water sector on behalf of its members, who include the water companies of the UK and Ireland. A number of the water companies in England and Wales have senior staff members representing them at UKWIR, through their capacity as board members and programme leads. They play a key role in shaping the water industry’s research and innovation agenda and UKWIR is arguably the main vehicle for collaborative research between the water companies. Indeed, UKWIR enables larger scale research than would otherwise be achieved. UKWIR has published reports that consider specific innovations within the sector, such as process intensification.

**Innovation is supported in various ways by UK Research and Innovation (UKRI).** UKRI is a non-departmental public body sponsored by the Department for Business, Energy and Industrial Strategy (BEIS). UKRI’s engagement is co-ordinated by the Natural Environment Research Council (NERC), which includes chairing a cross-UKRI water interest group. Activities undertaken by NERC include:

- Engagement with the [UK Water Partnership](#);
- [Water Research Directory UK](#): a searchable listing of individuals active in water research;
- [WaterR2B](#): a repository of case studies highlighting how businesses have benefited from research relating to water;
- Liaison between the NERC and sector organisations, including UKWIR;

<sup>26</sup> Ofwat (2017), Ofwat’s price review: Delivering more of what matters. Our final methodology for the 2019 price review – executive summary, p.4.



- Representing the UK on the governing board of the [Water Joint Programming Initiative](#) (Water JPI) on water challenges for a changing world.<sup>27</sup>

**Prior to the Innovation Fund, the sector lacked a comprehensive and formal mechanism for initiating and co-ordinating multilateral collaboration around innovation.** This gap has since been partly filled through the establishment of the Spring Centre of Excellence for Innovation, which was backed by the regional water companies in the UK and Ireland, and supported by a strategic steer from sector-level bodies (including UKWIR) and Ofwat. Although Spring was established with financial support from the Innovation Fund, the intention to create such a centre of excellence was set out in the UK 2050 Water Innovation Strategy. Spring’s mission is to attract, connect and support innovators across the industry to accelerate transformation. Spring offers key services, namely:

- Identification of opportunities and challenges – Driving strategic priorities by sharing information about the latest opportunities and challenges;
- Creating opportunities for collaborative projects – By giving water companies sight of supplier applications and an opt in/out for projects, innovators will be able to pitch directly to water companies and receive constructive feedback;
- Community library – Access to, and information on, communities of knowledge and practices to foster collaborations and expertise across the industry;
- Partnership Brokerage – Connecting problem owners and problem solvers to partner on solutions to our critical challenges;
- White space identification - Helping all types of innovators through the ideation and collaboration journey and discovering untapped opportunities to collaborate.<sup>28</sup>

**Given Spring’s mission and the range of services offered, there is potential to address some of the innovation challenges identified in the water sector.** First, Spring’s “communities of knowledge” could strengthen collaboration around shared challenges facing water companies or around specific new innovations; the communities could enable the sharing of experience around the utility and feasibility of different innovation, although resources may be required to ensure the communities are effective. Second, there may be scope to mirror at sector level some of the approaches taken by individual water companies to engaging suppliers (see section 3.2.1), such as structured networks for supporting suppliers to bring forward innovations, a single point of entry or open model of soliciting innovations, open events for soliciting innovations for potential suppliers, or pilot projects with suppliers. Here, the intention would be to complement and add value to the activities of individual water companies rather than to duplicate or replace them. Evidence from the interviews suggests that the smaller water companies might particularly benefit, given their more limited resources for scanning the market and engaging suppliers. Spring has already taken steps in this direction, for example, through its “Innovation Challenges”, which give innovators the opportunity to share their solutions with the water companies in relation to key themes in the UK 2050 Water Innovation Strategy. The first challenge was launched in February 2022 with a focus on reducing operational emissions from water and wastewater treatment, whilst the second challenge will focus on achieving net zero carbon.<sup>29</sup>

**An example of the potential for increased collaboration around innovation at sector level is offered by the energy sector.** The Energy Innovation Centre ([EIC](#)) is a not-for-profit body that serves as a

<sup>27</sup> <https://www.ukri.org/what-we-offer/browse-our-areas-of-investment-and-support/water/>

<sup>28</sup> <https://spring-innovation.co.uk/our-services/>

<sup>29</sup> <https://spring-innovation.co.uk/2022/02/14/spring-launch-first-innovation-challenge/>

platform to bring together energy companies and other players to promote innovation in the sector. The services provided by the EIC include an open portal where innovators and suppliers can submit an innovative idea or product, a guide to funding for innovation, and a map of UK testing and demonstration facilities. The EIC also operate “Calls for Innovation & Challenges”. These are requests for innovation identified by the industry partners around issues such as network capacity management, theft of gas, underground detection, or personal reliance on low carbon technologies. To date, more than 150 calls for innovation have been launched, of which around 85% have been successful in sourcing a solution. The EIC also tracks the state of innovation in the sector by using an Innovation Measurement Framework (IMF). The IMF enables licensed network operators (LNOs) to report a broad range of innovation outcomes, including collaboration and partnerships (with other LNOs and external parties), the speed at which successful innovation is moved into business as usual (BAU) and the benefits which integrating innovation into BAU has delivered for customers. The IMF is based on two axes:

- Different levels of enablers of innovation: results and outcomes; capability and technology; organisation and culture; strategy and vision.
- Progress of innovation over time: initiation and ideas; demonstration, iteration and learning; deployment and optimisations.

**Aside from UKWIR and Spring, there are examples of water companies taking a multilateral approach to collaboration around innovation.** For instance, Severn Trent Water has worked with other water companies to trial a range of solutions that could be used to enhance their water treatment sites. In addition, the company collaborated with five other water companies on the Saratech trial, and has also established the River Severn working group. Welsh Water confirmed that there are in excess of 100 collaborative ventures at any one time, while Northumbrian Water regularly submits bids with several other water companies. Other water companies, such as SES Water, South West Water, South East Water and Anglian Water have all confirmed that they are engaged in multilateral collaboration around innovation. Additionally, collaborative activity takes place on a regional basis, for example through Innovate East and Water Resources in the South East.

However, the extent of collaboration varies across the sector, with some engaged in more initiatives than others. This is perhaps a result of the overarching UK 2050 Water Innovation Strategy and the associated resources, but there certainly seems scope for wider and more inclusive collaboration.

**Table 15 Survey evidence: sector-level collaboration**

Survey questions and response options	Responses
<b>Prior to the Innovation Fund, to what extent did the company collaborate with other regional water companies on sector-wide initiatives (e.g. fora, structures)?</b>	
• Extensive, structured and long-term multilateral collaboration or engagement with sector-wide innovation initiatives (e.g. in a leading role)	3
• Regular multilateral collaboration or engagement with sector-wide innovation initiatives	5
• Occasional or ad hoc multilateral collaboration or engagement with sector-wide innovation initiatives	1
• No particular multilateral collaboration or engagement with sector-wide innovation initiatives	0

*Source: survey of regional water companies (not including NAVs)*

**Table 16 Indicator statements: multilateral collaborations**

Multilateral collaborations around innovation
<ul style="list-style-type: none"> <li>Water companies engage extensively on a multilateral basis through UKWIR, where they are represented by senior staff.</li> <li>There is scope for strengthened collaboration around shared challenges facing water companies or around specific new innovations. Spring's "communities of knowledge" may offer one means to do this.</li> <li>There is scope for greater action at sector level to engage suppliers of innovations, as a complement to individual water companies' own efforts. The Energy Innovation Centre offers an example of how innovation challenges and other actions could be launched at sector level.</li> <li>The extent of multilateral engagement varies across the sector, with some water companies involved in several initiatives outside of UKWIR and Spring.</li> </ul>

### 3.1.2 Bilateral water company collaborations

**Water companies also cooperate on a bilateral basis, which offers opportunities for discussions around innovation and joint research projects.** All nine companies responding to the survey reported collaboration on innovation with other companies, although in most cases (5), this was ad hoc rather than extensive, structured and long-term. Most also believed that water companies (in general) collaborated and shared data, insights and ideas to a reasonable or great extent. Reinforcing this, the water companies confirmed in the interviews that more collaboration takes place on a multilateral basis, which is unsurprising given that areas of interest are generally shared across the industry and there are forums in place to facilitate multilateral collaboration.

Feedback has indicated that many of the water companies undertake information sharing exercises, co-sponsor PhDs, organise events and discuss ongoing challenges for the sector, such as leakage reduction. For example, South West Water and Portsmouth Water share knowledge about leakage management systems. Portsmouth Water and SES Water have the 'Collaborate to Innovate' initiative, which has increased the sharing of ideas and enabled more cost-effective solutions for both companies. Northumbrian Water have undertaken a number of information sharing exercises with United Utilities, Southern Water and Thames Water, while United Utilities collaborate with other water companies as part of the PhD programmes it supports.

**Table 17 Survey evidence: bilateral collaboration**

Survey questions and response options	Responses
<b>Prior to the Innovation Fund, to what extent did the company collaborate with other regional water companies outside of sector-wide initiatives?</b>	
<ul style="list-style-type: none"> <li>Extensive, structured and long-term collaboration with two or more other regional water companies around innovation</li> </ul>	2
<ul style="list-style-type: none"> <li>Extensive, structured and long-term collaboration with one other regional water company</li> </ul>	2
<ul style="list-style-type: none"> <li>Occasional or ad hoc collaboration with other water companies</li> </ul>	5
<ul style="list-style-type: none"> <li>No particular bilateral collaborations around innovation</li> </ul>	0
<ul style="list-style-type: none"> <li>Don't know</li> </ul>	0
<b>Prior to the Innovation Fund, to what extent were regional water companies (in general) collaborating with each other effectively around innovation?</b>	

Survey questions and response options	Responses
• To a great extent	1
• To a reasonable extent	7
• To a slight extent	1
• Not at all	0
• Don't know	0
<b>Prior to the Innovation Fund, to what extent were regional water companies (in general) open to sharing data, insights and ideas to support innovation practices?</b>	
• To a great extent	1
• To a reasonable extent	6
• To a slight extent	2
• Not at all	0
• Don't know	0

Source: survey of regional water companies (not including NAVs)

**Table 18 Indicator statements: bilateral water company collaborations**

Bilateral water company collaborations around innovation
<ul style="list-style-type: none"> <li>• There is a degree of collaboration on a bilateral basis, with activities centred around joint projects and information sharing. Discussions take place on both an informal and formal basis.</li> <li>• There is a lower level of bilateral collaboration than multilateral collaboration across the water sector.</li> <li>• The level of bilateral cooperation and types of activities vary across water companies.</li> </ul>

## 3.2 Collaborations with other players

### 3.2.1 Suppliers

**Supply chains of water companies are potentially a key source of innovations in the sector.** In each five-year price review period, water companies typically have to procure a substantial amount of goods and services. They therefore have a diversity of interactions with suppliers: ranging from one-off or ad hoc purchases to long-term, multi-faceted and structured relationships. However, water companies will not be aware of every available innovation that is potentially of benefit to them, whilst suppliers may not know the precise needs of water companies. There may also be innovations in other utility sectors with potential application to the water sector but as yet untested in the sector. Two key questions are thus: i) the degree to which the supply chain brings innovations to water companies; ii) the extent to which water companies engage with (actual or potential) suppliers in such a way as to exploit the innovation potential of the supply chain.

**The regional water companies tended to report that there is no shortage of potential suppliers offering them innovations.** All nine companies responding to the survey reported extensive, ongoing and regular collaboration with several suppliers around innovation. In the interviews, some water companies reported either that their existing suppliers could be stimulated to innovate or that they were regularly approached by new suppliers offering potential innovations. Some also reported an expansion of the supply base in recent years, for example, through the entry of new suppliers from other countries. Moreover, suppliers are increasingly offering opportunities to transfer innovative technologies from other fields into the water sector, for example, relating to artificial intelligence (AI) or the internet of things.

**There can, however, be a challenge around the identification of the most appropriate innovations.** Some water companies reported the difficulty of numerous suppliers offering innovations that were

often unproven in the water sector or that might not be relevant to the specific challenges facing the company. Indeed, the diversity of the water companies and of their geographical areas means that innovations cannot always be easily transferred from one company to another. Thus, the evidence suggests a possible need at sector level for a more structured way for water companies, first, to signal their needs to the market and, second, to get strong intelligence on the suitability of different innovations. This need is particularly important for the smaller water companies who typically have less capacity to scan the mass of suppliers in the market.

Following on from this, one major challenge is about the best ways for the water companies to engage with the supply chain. On this point, a number of approaches taken by different water companies have been identified.

**Structured networks for supporting suppliers to bring forward innovations:** one way by which water companies have solicited innovations without being overwhelmed with proposals of limited relevance is to create a structure for supporting potential suppliers who have innovations to bring forward. Two examples are:

- Anglian Water has for several years operated the “[Water Innovation Network](#)”, a business network and partnership initiative. The Network is managed by [Allia](#): a charity that helps small businesses and charities to grow. Businesses, organisations and individuals can submit their innovative solutions to industry experts and decision makers within Anglian Water. A Review Group meets every six weeks to consider submissions and select those that will be taken forward. In the preparation of their submissions, suppliers can receive support from a number of specialist intermediary bodies.
- Northumbrian Water has for several years operated the [Run2 Innovation](#) initiative. This is a cooperative forum that facilitates sharing of insights into new technology and services with contractors.

**Single point of entry / open models of soliciting innovations:** given that water companies will not be aware of every available innovation that is potentially of benefit to them, some water companies offer a specific mechanism by which potential suppliers can propose innovations. For suppliers, this removes the problem of not knowing who to approach within the water company. For water companies, this removes the problem of receiving unsolicited approaches in a haphazard way. Examples include:

- Northumbrian Water operates “[Amplify](#)”, an open innovation platform where suppliers can register a technology, product or service that is new to market. Suppliers can also use Amplify to express an interest in partnering with Northumbrian Water to enter the Ofwat Innovation Fund competitions.
- [Wessex Water Marketplace](#) is a platform which since 2019 has presented a number of challenges facing the company in the form of an open question. Instead of asking suppliers to tender for a pre-determined solution, the Marketplace invites them to propose a solution. Through the Marketplace, the water company then works with potential suppliers to determine whether a blend of their solutions could provide a solution. The emphasis is on sharing data and being open and transparent in the assessment of the solution.
- Hafren Dyfrdwy sets out an open innovation model in the company’s PR19 business plan. This features open calls to existing suppliers, researchers and other sectors setting out short and long term needs and the gaps to be met through innovation.

**Open events for soliciting innovations for potential suppliers:** water companies typically hold supplier engagement events on an annual basis, so that potential suppliers can connect with the relevant staff within the water company. In some cases, water companies have very explicitly focussed them on innovations.

- Northumbrian Water has since 2017 organised an annual [Innovation Festival](#), which brings together innovators physically and digitally for a series of design sprints, hacks, workshops and activities, aimed at solving problems such as climate change and water poverty. Projects emerging from the Festival are then piloted.
- South West Water hosts supplier innovation days, where suppliers are invited to setup stalls at the water company's office to allow drop-in sessions through the day for employees on site.
- United Utilities plans to hold an annual supplier conference to encourage engagement from suppliers.

**Pilot projects with suppliers:** a common approach is for water companies to operate pilot projects with suppliers to test innovations with a view to rolling them out, if successful. The nature of the pilot projects is such that suppliers typically have to be hand-picked by the water companies rather than selected via a conventional recruitment process.

- Yorkshire Water has implemented a [Smart Water networks pilot in Sheffield](#) in partnership with 15 suppliers, including companies supplying technology, communications, professional services, and health and social care. The 12-month pilot was announced in September 2020. It will integrate rich data from multiple new and existing sources and present it in a single visualisation platform. The results of the pilot will be used as part of the wider Yorkshire Water's digital strategy to determine future dynamic control and system optimisation capabilities.
- Welsh Water has in recent years implemented innovative pilot projects around the [Brecon Beacons Mega Catchment](#) in partnership with the supply chain, customers, the third sector and regulators.
- Northumbrian Water has since 2020 been implementing [pilot projects with O2](#) concerning staff health and wellbeing analysis using AI; remote infrastructure monitoring using a drone and AI; In-home water monitoring using Internet of Things sensors; transferring high data volumes for GIS management; augmented reality mapping; virtual reality training.

**Promoting innovations through the procurement process:** given the volume and diversity of goods and services that water companies procure, the procurement process itself can be used to drive innovations in the supply chain. For example, it was reported that Severn Trent Water had taken steps to promote innovation when retendering contracts with the "usual" suppliers. However, there can be limits to the extent to which the procurement process can deliver innovations, as water companies will usually need to be fairly prescriptive when issuing a tender, which might risk ruling out some potential innovations if they do not match the tendering requirements. Moreover, a competitive tendering process would generally be unsuitable in the case of specific innovations that only one supplier can offer. Thus, using the procurement process to drive innovation may need to be complemented by open approaches and pilots, as just described.

Using the procurement process to promote innovation can be more effective when there is proactive engagement with suppliers. For example, it was reported that technical specialists from Yorkshire Water have upfront conversations with their suppliers around the company's innovation needs. The company also reported that the firm's water engineers were working more closely than usual with a supplier of innovative on sensor technology for water networks, which was building the engineers' knowledge of the innovative technology and enabling the supplier to better understand the water company's needs.



**Table 19 Survey evidence: collaboration with suppliers**

Survey questions and response options	Responses
<b>Prior to the Innovation Fund, to what extent did the company collaborate with suppliers around innovation (e.g. to canvass innovative technologies, use of data, development of IP, etc.)?</b>	
• Extensive, ongoing and regular collaboration with several suppliers around innovation	9
• Ongoing collaboration with one supplier around innovation	0
• Ad hoc collaboration with one supplier around innovation	0
• No particular collaborations with suppliers around innovation	0
<b>Prior to the Innovation Fund, to what extent were (potential) suppliers to the regional water companies developing / offering innovative new products and services?</b>	
• To a great extent	3
• To a reasonable extent	6
• To a slight extent	0
• Not at all	0
• Don't know	0

Source: survey of regional water companies (not including NAVs)

**Table 20 Indicator statements: collaborations with suppliers**

<b>Innovation collaborations with suppliers</b>
<ul style="list-style-type: none"> <li>• None of the regional water companies reported any particular inadequacy in the volume and diversity of suppliers offering innovations or in the range of innovations offered.</li> <li>• There is challenge for water companies to find the best ways to engage with the supply chain.</li> <li>• A few water companies operate structured networks for supporting suppliers to bring forward innovations. These networks feature an on-line platform as well as support in preparing submissions.</li> <li>• A few water companies operate a single point of entry for potential suppliers to approach them with innovations. These feature an on-line platform with information or guidelines on how to submit proposals.</li> <li>• Very few water companies publicise specific challenges they are facing and invite the submission of innovative responses. This approach might merit replication by more companies.</li> <li>• A few water companies organise events specifically related to innovation, where suppliers can propose innovations to the water company. The specific focus on innovation differentiates them from traditional “meet the buyer” events and conferences.</li> <li>• Some water companies rely solely or primarily on innovations sourced through (relatively conventional) procurement processes. This can be effective to a certain degree, particularly where the water companies proactively engage with suppliers in advance of the procurement process and subsequently with appointed contractors. Where procurement is the main way by which innovations are sourced, this may need to be complemented by some of the more open approaches (structured networks, single point of entry, challenges).</li> <li>• At the sector level, prior to the creation of the Innovation Fund, there was no structure or platform where water companies could raise their innovation needs, scan the market and connect with suppliers that can offer solutions that are relevant to their specific situation and geography. Such a platform might incorporate some kind of expert brokerage role. This need is particularly relevant for small water companies that do not have the capacity to fully scan the diversity of suppliers and possible innovations.</li> </ul>



### 3.2.2 Research sector

Whilst innovations can take many forms (e.g. product, process), many are linked to new technologies and new techniques. Commercial suppliers will, naturally, most often offer innovations that are market-ready or close to being market-ready. However, as in any sector, there is often a need to stimulate innovations further “upstream”. For example, the innovation team at Yorkshire Water specifically focuses on technology that is not yet proven, defined as below Level 9 on [NASA’s](#) definition of Technology Readiness Levels (TRL), where 9 is “flight proven” and 1 is “basic principles observed and reported”. Water companies thus face the need to stimulate innovations that are not yet market-ready, which typically may require engagement with the research and development sector, including universities, research institutes and private companies.

**All the regional water companies have established relationships with at least one academic or research organisation**, although the nature, depth and intensity of these relationships varies both within and between water companies. Each company will face a variety of challenges and will therefore mostly likely need to draw on the expertise of a range of partners. Clearly, the nature of these relationships will vary in line with need, but also the size and capacity of companies, with the smaller companies being less able to invest fewer resources than the larger companies.

**Most or all regional water companies typically partner with universities and research bodies on specific R&D projects developing upstream innovations.** For example, Severn Trent Water collaborated with Coventry University on a [pilot project](#) to convert sewage waste into hydrogen. South Staffordshire Water has collaborated with University of Cambridge and the University of East Anglia to research ways of reusing waste created by nitrate removal plants.

**Some water companies are co-partners in research units within universities**, which allows them to share resources, staff and expertise with the universities. This arrangement also allows the water companies to prioritise research into issues specifically affecting them and to shape innovations in such a way as to be relevant to their geographies. Water companies can then be in a strong position to be quite prescriptive in subsequent procurement processes. Examples include:

- The [Anglian Centre for Water Studies](#) at the University of East Anglia focusses on research and innovation related to four themes: “Resilience to Climate Change”, “Environmental Sustainability in a Circular Economy”, “Engaging Society”, and “Competition, Markets and Regulation”.
- The [Centre for Resilience in Environment, Water and Waste](#) (CREWW) was established in 2020 as a joint venture between South West Water and the University of Exeter, including £21m from the water company and with a grant from Research England. Academic researchers from CREWW operate closely with the in-house innovation team at South West Water.
- The [Biological Engineering: Wastewater Innovation at Scale](#) (BEWISe) facility is a partnership between Newcastle University and Northumbrian Water, based at the company’s sewage treatment plant at Birtley, near Gateshead. It focuses on large-scale wastewater treatment research using bacteria.

**Some water companies have formalised “strategic relationships” with universities and research bodies.** These relationships provide a framework for long-term collaboration within which specific projects can be implemented. In some cases, such relationships are governed by Memoranda of Agreements.

- Northumbrian Water has two “strategic research partners”, namely Durham University and Newcastle University. The strategic relationship with Newcastle University has been recognised by the “Business/Industry Collaboration of the Year Educate North Award 2017”.<sup>30</sup> This

<sup>30</sup> <https://www.ncl.ac.uk/media/wwwnclacuk/facultyofsage/files/collaboration/Local-Partnership-Global-Innovation-Northumbrian-Water-Newcastle-University.pdf>

arrangement has facilitated a range of projects, including on Digital Twin technology, and blue-green infrastructure.

- Thames Water is named as one of the University of Surrey’s “industry partners” working on long-standing collaboration. In this context, research has included a [four-year project](#) to develop an innovative approach to transforming sewage into biogas, which can then be used to generate enough green electricity to power its sewage treatment sites during peak periods.

**EU funding has been a key source of funding for water companies’ collaborations with universities and research organisations.** In light of the UK’s departure from the EU, this creates a challenge for water companies to secure new sources of funding for such collaborations. Indeed, several water companies, particularly the smaller ones, highlighted that external funding is vital to enabling the kind of upstream innovations needed. Examples include:

- The collaboration between Severn Trent Water and Coventry University (described above) was part of a wider project funded by the EU’s Horizon 2020 programme, namely, [REWAISE](#), which aimed to create a new “smart water ecosystem”, integrating an intelligent digital framework for decentralised water services and decision-making.
- Portsmouth Water received EU funding from the Channel Payments for Ecosystem Services ([CPES](#)) project supported by the Interreg programme. The project tested innovative approaches to reducing nitrate concentrations in drainage waters through adjustments to farming practices. The results of the pilot are informing the water companies approach to developing a system of payments for ecosystem services.
- South West Water collaborated with universities and research organisations in the UK and other countries as part of the [SIM4NEXUS](#) project, which was co-financed by the EU’s Horizon 2020 programme. The aim of the project was to increase understanding of how water management, food production and consumption, energy supply and land use policies are linked together, and how they relate to climate action. The project took research and tested innovative approaches that were intended to lead to commercial applications and training courses.

**Table 21 Survey evidence: collaboration with the research sector**

Survey questions and response options	Responses
<b>Prior to the Innovation Fund, to what extent did the company collaborate with research institutions, technology providers or similar around innovation (e.g. to canvass innovative technologies, use of data, development of IP, etc.)?</b>	
• Extensive, ongoing and regular collaboration around innovation	8
• Ongoing collaboration with one body around innovation	0
• Ad hoc collaboration with one body around innovation	1
• No particular bilateral collaborations around innovation	0
<b>Prior to the Innovation Fund, to what extent were research institutes or universities generating new solutions of relevance to regional water companies?</b>	
• To a great extent	1
• To a reasonable extent	5
• To a slight extent	3
• Not at all	0
• Don’t know	0

Source: survey of regional water companies (not including NAVs)

**Table 22 Indicator statements: collaborations with the research sector**

Innovation collaborations with the research sector
<ul style="list-style-type: none"> <li>• All the water companies have established relationships with universities or other research bodies. The nature, depth and intensity of these relationships varies both within and between water companies.</li> <li>• Some water companies have very structured, strategic and long-term relationships with universities or research bodies, whereas for other water companies the relationship may be more ad hoc and project-based (albeit featuring successive projects in many cases).</li> <li>• Three of the large water companies (Anglian Water, Northumbrian Water, South West Water) are co-partners in academic research units specifically devoted to serving the water industry.</li> <li>• Water companies currently face the need to secure new sources of funding for collaborations with universities and research organisations, as they will no longer have access to EU programmes, such as Horizon Europe or Interreg. For small water companies, this is a particularly pressing need, given the lower levels of their own discretionary funds for innovation compared to large water companies.</li> </ul>

### 3.2.3 Education and training sector

The OECD recognises that employee training can be an innovation activity, for example, training personnel to use innovations, such as new software logistical systems or new equipment, or training relevant to the implementation of an innovation, such as instructing personnel or customers on the features of a product innovation. According to the OECD, this is distinct from training for research and development or for engineering, design and other creative work.<sup>31</sup>

**In general, the water companies have mostly not engaged the education and training sector in providing innovation training per se.** For example, one company reported that the material and course content from some innovation training providers active in the sector is not of sufficient quality to drive value and enhance innovation skills and approaches. More often, the approach taken by water companies is to recruit staff with the necessary technical expertise and to provide workforce training linked to specific technical issues. Several of the largest water companies sponsor post-graduate students and researchers, often as part of their wider partnership with a university. For example, Anglian Water, South West Water and United Utilities provide work placements for PhD and MSc students. Severn Trent Water and Southern Water also sponsor a number of PhD students each year. Such arrangements were generally seen as being a useful way to recruit talent, tap into academic expertise and maintain a constructive relationship with universities. However, the water companies did not particularly see them as being a key driver of innovation. In this context, there may be scope for a sector-level dialogue around innovation training, so that there are better connections between water companies and the education and training sector; Spring may be able to play a role here.

**A few water companies have specifically made use of innovation-specific training offered by the education and training sector.** Such training was typically bespoke and short-term and offered to existing staff. For example:

- Welsh Water worked with Cardiff Business School to develop the [Embedding Innovation](#) programme. The programme operated over five days. The first four days featured sessions on knowledge transfer and exploration in the morning and a practical innovation work-stream in the afternoon where participants worked on practical company improvements. This was

<sup>31</sup> OECD/Eurostat (2018), Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris/Eurostat, Luxembourg.

complemented by a final day focussed on the process of embedding tools and methods throughout the company and on developing an in-house innovation toolkit. The benefits are twofold. First, staff are reported to be more skilled in supporting innovations (“better at finding, assessing, buying and contracting for innovation”). Second, some contract projects emerged, such as new uses of performance data, new products and processes for reviewing equipment faults and an examination of the internal innovation culture and triggers for behaviour change.

- South West Water has organised “Design Sprints” for staff in partnership with Exeter University.
- As part of its Innovation Ambassador programme, Northumbrian Water has provided innovation capability-related courses using internal and external providers. Training has covered fields such as facilitation, design thinking, intellectual property rights, innovation resilience, and visual facilitation.

**Table 23 Survey evidence: collaboration with the education and training sector**

Survey questions and response options	Responses
<b>Prior to the Innovation Fund, to what extent did the company collaborate with training and education providers around innovation (e.g. developing innovation training)?</b>	
• Extensive, ongoing and regular collaboration around innovation	3
• Ongoing collaboration with one body around innovation	2
• Ad hoc collaboration with one body around innovation	2
• No particular bilateral collaborations around innovation	2
<b>Prior to the Innovation Fund, to what extent were higher education and vocational training providers effectively incorporating an innovation dimension into relevant courses?</b>	
• To a great extent	0
• To a reasonable extent	2
• To a slight extent	3
• Not at all	0
• Don’t know	4
• Not relevant – not needed by regional water companies	0
<b>Prior to the Innovation Fund, to what extent could water companies access innovation-related training for their workforces?</b>	
• To a great extent	0
• To a reasonable extent	5
• To a slight extent	2
• Not at all	0
• Don’t know	2
• Not relevant – not needed by regional water companies	0

Source: survey of regional water companies (not including NAVs)

**Table 24 Indicator statements: collaborations with the education and training sector**

Innovation collaborations with the education and training sector
<ul style="list-style-type: none"> <li>• In general, water companies have not provided their staff with innovation training per se. Instead, they have prioritised good technical training in relevant disciplines.</li> <li>• The many relationships and collaborations that water companies have with the education and training sector do not generally extend to the provision of innovation training for workforces.</li> <li>• There are a few ad hoc institutions of innovation-specific training that offer potential to foster an innovative mindset and develop staff capability to support innovations, as well as to stimulate specific innovations.</li> </ul>

### 3.2.4 Other local stakeholders

In the course of their operations, water companies have to engage with a range of other local stakeholders for different purposes, particularly local authorities.

**There are instances of water companies collaborating with local authorities and other local stakeholders to promote innovation.** Indeed, six of the nine companies responding to the survey reported extensive, ongoing and regular collaboration with local stakeholders around innovation. Of course, all the water companies have to engage with their relevant local authorities, for example, around planning or land use. However, some have developed more proactive collaborations around innovation. For local authorities, the interest in collaborating with water companies in this way may be twofold: to promote economic development and improve the local environment. Local authorities can see themselves as playing a key role in brokering relationships between local communities, local firms (particularly SMEs), academia and water companies, as a means of stimulating new approaches to tackling economic or environmental challenges. One example is:

- Northumbrian Water is a partner in “[The Water Hub](#)”, a collaborative initiative led by a multi-agency partnership also involving Durham County Council, Durham University and the Environment Agency and co-funded by the EU’s European Regional Development Fund. The Water Hub offers small capital grants for innovations, facilitates research collaborations, provides live test and demonstration facilities, offers business support and mentoring, and arranges challenge events, and networking opportunities. Activities are aimed at bringing stimulating innovations between businesses, communities, end-users, government bodies and research institutes. The focus is on use of big data, integration of technology and human behaviour, catchment management, efficient use of water, wastewater and energy, and community engagement.

**More often, water companies collaborate with local authorities on innovative projects rather than on the promotion of innovation per se.** Here, the local authorities may engage in the role as the planning authority or as the elected representatives of local communities. For example, Anglian Water leads “[Future Fens: The Integrated Adaptation Project](#)” aims to build resilience to drought and flooding through an innovative approach to collaboration with local communities, local businesses, local authorities and government bodies.

**Table 25 Survey evidence: collaboration with other local stakeholders**

Survey questions and response options	Responses
<b>Prior to the Innovation Fund, to what extent did the company collaborate with local stakeholders around innovation (e.g. local authorities, local business bodies, landowners)?</b>	
• Extensive, ongoing and regular collaboration around innovation	6
• Ongoing collaboration with one body around innovation	0
• Ad hoc collaboration with one body around innovation	3
• No particular bilateral collaborations around innovation	0

*Source: survey of regional water companies (not including NAVs)*

**Table 26 Indicator statements: collaborations with local stakeholders**

<b>Innovation collaborations with local stakeholders</b>
<ul style="list-style-type: none"> <li>• There are several instances of water companies collaborating in a strategic and structured way with local authorities and other local stakeholders specifically to promote innovation.</li> <li>• In some cases, water companies collaborate with local authorities on ad hoc innovative projects rather than on the promotion of innovation per se.</li> </ul>

### 3.2.5 Regulators and other public bodies

In the provision of water and wastewater services, water companies are subject to regulation not only by Ofwat but also by other regulators. Most notably, the Environment Agency and Natural Resources Wales have the remit to protect and improve the environment in England and Wales respectively, which includes responsibility for regulating environmental water quality, whilst the Drinking Water Inspectorate is responsible for regulating water supplies in England and Wales, so that they are safe and drinking water quality is acceptable to consumers. Regulators such as the Environment Agency, Natural Resources Wales and the Drinking Water Inspectorate interact with water companies in the course of ensuring compliance. In some cases, they have also engaged with water companies in respect of innovation, as have some other public bodies, such as the Forestry Commission or Natural England (the government's advisory board for the natural environment in England).

**There are ad hoc instances of water companies collaborating with regulators and public bodies around innovation.** Such collaborations address shared objectives of the water companies and regulators or public bodies. They tend to be responses to specific local challenges and often form part of a broader collaboration around environmental stewardship and land management. Very often, they involve a wider range of partners, such as local authorities, universities, landowners or farmers. Examples include:

- Anglian Water leads “[Fens for the Future](#)”, an integrated adaptation taskforce, in partnership with the Environment Agency, Natural England, Anglia Ruskin University, local authorities, Country Land and Business Association (a membership organisation representing land owners), and local and national third sector organisations. The partnership works together for the conservation of the natural landscape in the Fens, including the maintenance of wetlands and improvements in water quality. Whilst the partnership itself is an innovative form of collaboration, it also tests innovative new approaches to protection of the natural landscape.
- Portsmouth Water has collaborated with the Forestry Commission on innovative land management projects, including a wood creation scheme. The company has also collaborated with the Environment Agency to provide advisory guidance notes for housing developers and local authorities on how to undertake works that involve intrusive foundations, sustainable urban drainage and other construction activities without polluting the aquifer.
- Portsmouth Water has also collaborated with the Environment Agency and Catchment Sensitive Farming to form the [Downs and Harbours Clean Water Partnership](#). The Partnership implements innovative approaches to tackle rising nitrate levels and other diffuse pollution issues related to farming. This includes the [Payment for Ecosystem Services \(PES\) Scheme](#), which pays farmers and landowners to implement nitrate reduction measures, as well as the [Portsmouth Water Capital Grant Scheme](#), under which farmers can receive advice and financial assistance to invest in capital times that reduce the risk of pollutants reaching groundwater.
- United Utilities is a partner in “[Natural Course](#)”, a collaborative project with the Environment Agency, Greater Manchester Combined Authority, Natural England, and the Rivers Trust. Co-financing is provided by the EU's Life Programme, which supported partnerships to implement environmental and climate plans, programmes and strategies. The project aims to better understand and overcome barriers preventing the achievement of ‘good ecological status’ under the EU Water Framework Directive in the North West River Basin District. This is done through trialling innovations related to catchment understanding, diffuse pollution, natural capital and water governance.
- Yorkshire Water is part of the “[Living with Water](#)” partnership, which also includes the Environment Agency, Hull City Council, East Riding of Yorkshire Council, and the University of Hull. The partnership develops innovative water management systems as a means of building flood resilience.



**Through Streamline, the regulators now offer a structured way for innovators and businesses to receive support for innovation in the form of non-binding regulatory advice on rules and regulations but there is scope for more collaboration at sector level.** The examples just described show that collaboration around innovation is taking place between other regulators and public bodies and water companies. These collaborations and pilot projects offer the potential for learning to be gained and for effective innovations to be identified. Whilst the projects typically feature some dissemination of experience, this is not co-ordinated across the sector. Moreover, the dialogue around innovations tends to take place with individual water companies on specific issues, rather than at sector level on common challenges and how to transfer effective innovations between companies. Water companies have reported that they value the opportunity to engage with regulators in a forward-looking way to address challenges rather than merely responding to the instructions of regulators once problems arise. There may be scope for Spring to address this by facilitating sector level dialogue on innovation between regulators and water companies.

**Some water companies are accessing innovation funding from other UK public bodies.** In addition to Ofwat's Innovation Fund, some public bodies offer funding that can be accessed by water companies to support their innovations. They include:

- HM Treasury's [Shared Outcomes Fund](#) supports pilot projects to test innovative ways of working across the public sector, with an emphasis on thorough plans for evaluation. Three water companies had reportedly secured funding through HM Treasury's [Shared Outcomes Fund](#) for a major innovative project.<sup>32</sup>
- Fibre in Water (FiW) is an open competition funded by the Shared Outcomes Fund, which is run by DCMS with support from DEFRA, BEIS and Cabinet Office. It will allocate up to £4 million to innovative projects that develop and build a pilot to facilitate delivery of advanced broadband and mobile services via drinking water mains. Supported projects were due to be implemented between the first quarter of 2022 and the first quarter of 2024.<sup>33</sup> Although information was not available on the selected projects, it is likely that some will involve regulate water companies given the need to access water mains.
- Department for Environment, Food & Rural Affairs (Defra) offers funding for tests and trials as part of its Environmental Land Management (ELM) scheme. The business plan of Portsmouth Water highlights that the company's collaboration with the Forestry Commission was being considered as a pilot within the ELM scheme.

**Despite instances of water companies accessing funding for innovation, they report difficulties in accessing financing for innovations.** Indeed, of the nine companies responding to the survey evidence, only two reported that water companies could secure financing to a reasonable extent. When asked to elaborate on their responses, most mentioned the challenges inherent to the price review process. However, one water company reported that grant providers, such as Innovate UK, tend to overlook large companies and link grants to long-term projects rather than short-term trials that offer the potential for successful innovations to be quickly adopted. In this context, Ofwat's Innovation Fund was particularly welcomed, in part because it allowed the risks associated with innovation to be shared between the regulator and the water companies. Several companies also commented that the value in the Fund was not only the financing available but also the impetus given to a more collaborative approach to innovation.

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<sup>32</sup> At the time of writing, it was not possible to name the companies or the project, as the outcome had not been publicly announced.



**Table 27 Survey evidence: supportiveness of the regulatory context**

Survey questions and response options	Responses
<b>To what extent is regulation of the water sector supportive of innovation (not including Ofwat's Innovation Fund)?</b>	
• To a great extent	1
• To a reasonable extent	2
• To a slight extent	5
• Not at all	1
• Don't know	0
<b>Aside from the Innovation Fund, to what extent are regional water companies able to securing financing for innovations (e.g. grants, equity, debt, loan guarantees)?</b>	
• To a great extent	0
• To a reasonable extent	2
• To a slight extent	6
• Not at all	1
• Don't know	0

Source: survey of regional water companies (not including NAVs)

**Table 28 Indicator statements: collaborations with regulators and other public bodies**

<b>Innovation collaborations with regulators and other public bodies</b>
<ul style="list-style-type: none"> <li>• There are ad hoc instances of water companies collaborating with regulators and public bodies around innovation in response to specific local challenges around environmental stewardship and land management.</li> <li>• There is currently no structured forum at sector level for water companies to engage with other regulators in relation to innovation, which represents a missed opportunity in terms of addressing common challenges and promoting the systematic dissemination and transfer of successful innovations.</li> <li>• Aside from Ofwat's Innovation Fund, some water companies are accessing funding for their innovations through other UK public bodies.</li> </ul>

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## 4. Conclusions

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### 4.1 Current innovation baseline

#### Corporate commitment to innovation

The research has found that innovation is presented as a prominent and explicit high-level objective in most water companies' business plans. Nearly all business plans feature a section dedicated to innovation, which sets out a comprehensive and strategic approach. However, this is not entirely the case across the sector, and approaches to innovation are not made explicit in all cases. The different approaches to innovation reflects the specific circumstances of water companies, as well as their different "starting points" in terms of innovation.

Most water companies have KPIs in their business strategies, however, for the most part, these are not directly linked to innovation. Rather, they tend to be linked to wider objectives and, as such, there is scope for water companies undertaking an assessment of their innovation activities to better understand how they are achieving the expected benefits as outlined in their business plans.

Two distinct approaches to the commitment of staff and resources can be identified. First, some water companies approach innovation as a distinct corporate function. To this end, most of the large water companies have senior staff responsible for innovation, as well as dedicated innovation units or managers. Second, some water companies prioritise mainstreaming innovation into most or all activities, as part of the company ethos, culture and mindset, rather than as a dedicated function in its own right. The small water companies naturally have less scope to appoint staff and teams solely dedicated to innovation, although this does not necessarily make them less innovative. However, in general, there is currently a lack of clarity around the exact number of staff and budget, which makes it difficult to assess this innovation metric.

All the regional water companies state a commitment to promoting an innovation culture and mindset and are open to staff putting forward suggestions for innovation. In some companies, the leadership visibly and proactively promotes innovation amongst all staff. Some water companies have a specific and structured process for soliciting innovation proposals from their workforce and taking forward – and financing - the most promising ones. However, the culture varies across the sector and within water companies, and is still improving.

Water companies have undertaken a wide array of innovation activities over the last few years, from traditional fields such as R&D and engineering, to new areas such as digital technologies and data analysis. The degree of scaling up varies by company, which should be considered in the context of the innovation objectives and the resources available. Some water companies have developed very structured ways of tracking innovations across the company, which facilitates the capturing of results company-wide and the scaling up of innovations. Additionally, it is important to highlight the risk in trialling solutions, which may explain preferences for adopting market-ready solutions. The level of scaling up should therefore be considered with the wider innovation activities taking place within water companies.

There have been instances of water companies adopting solutions from others in the water sector. However, the transfer of innovation can be hindered by the different geographies served by the water companies and by a need for greater knowledge amongst water companies as to which innovations have been successfully tested and rolled out elsewhere.

### Innovation ecosystem

There is scope for strengthened collaboration around shared challenges facing water companies or around specific new innovations. Spring's "communities of knowledge" may offer one means to do this. There is also scope for greater action at sector level to engage suppliers of innovations, as a complement to individual water companies' own efforts. The extent of multilateral engagement varies across the sector, with some water companies involved in several initiatives outside of UKWIR and Spring. There is a degree of collaboration on a bilateral basis, with activities centred around joint projects and information sharing. Discussions take place on both an informal and formal basis. The level of bilateral cooperation and types of activities vary across water companies.

There is a sufficient supply of innovations from a diversity of suppliers. However, the challenge is for water companies to find the best ways to engage with the supply chain. Effective approaches exist in some companies and these would merit replication by other water companies or at sector level. They include online portals for suppliers to propose innovations, publication of challenges inviting the submission of innovative responses, innovation events, and structure support to suppliers (either prior to or through the procurement process).

All the water companies have established relationships with universities or other research bodies. The nature, depth and intensity of these relationships varies both within and between water companies, with some being very structured, strategic and long-term relationships and others being more ad hoc. However, these relationships are threatened by the loss of EU funding in light of Brexit.

There are instances of water companies providing innovation-related training for senior staff, although this tends not to extend to the full workforce. The many relationships and collaborations that water companies have with the education and training sector do not generally extend to the provision of innovation training for workforces. Instead, the water companies have prioritised good technical training in relevant disciplines.

There is one instance of a water company collaborating in a strategic and structured way with local authorities and other local stakeholders specifically to promote innovation. Most often, water companies collaborate with local authorities on ad hoc innovative projects rather than on the promotion of innovation per se.

Some water companies are collaborating on innovation with the other regulators (e.g. Environment Agency) and other public bodies. However, the full potential of such ad hoc collaborations is not fully exploited, due to the lack of a structured forum at sector level for water companies to engage with other regulators in relation to innovation.

## 4.2 Reflections on the innovation framework

In developing this baseline situation, the current study has tested a framework for assessing the state of innovation in the sector. The purpose of testing the framework has been both to provide a structured way of assessing the current situation and also to provide a means to assess the future innovation situation – and thus evaluate long-term impacts of the Innovation Fund. Having tested the framework, we offer some reflections here on its utility.

First, the review of business plans can enable a "first-level" assessment of approaches to and capacity for innovation that is useful, albeit inadequate in itself. The advantage of reviewing business plans is that they are formal, publicly-available corporate documents, as well as authoritative and accurate, having been approved as part of the price review process. They provide evidence of stated corporate commitments, at least in principle. Nonetheless, business plans do not tell the full story and needs to be complemented by evidence from other sources.

Second, the level of staff and resources committed to innovation can be informative, provided that due account is taken of the relative size of water companies, and thus their ability to make staff and resources available. However, the research has exposed a choice that needs to be made by all water companies, i.e. the extent to which innovation is treated as a discrete corporate function in its own right, or whether the priority is to mainstream innovation across the company. In its ambition for the Innovation Fund to foster a culture of innovation, Ofwat may need to reflect on how that could or should play out in terms of corporate approaches to promoting innovation.

Third, in line with the objective of the Fund to bring about cultural transformation in the sector, the emphasis in this baseline has been on corporate commitment, process, and collaboration, rather than the specific challenges facing the sector (e.g. reducing leakage, reducing carbon emissions, etc.). In the course of the research, many examples of innovation activities relating to these challenges were identified, such as pilot projects, technology trials, new uses of data, etc. However, it has been outside the remit of this study to assess which challenges are receiving sufficient innovation “attention” or where a greater effort is needed. Over the next few years, Ofwat might therefore consider additional research regarding the sufficiency of innovation in relation to these different challenges.

Fourth, the framework takes the current regulatory framework largely as given. However, to a certain degree, the current state of innovation in the sector (in terms of culture, commitment and capability), reflects the extent to which regulation offers sufficient appropriate incentives and opportunities to innovate.

## Annex 1: Research tools

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## Questionnaire for survey of water companies

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### *Survey welcome page*

Welcome to the survey of regulated water companies regarding innovation in the sector.

The Centre for Strategy and Evaluation Services ([CSES](#)) is carrying out a study on behalf of Ofwat to create a baseline for innovation in the water sector (prior to the Innovation Fund, i.e. in August 2020). The baseline will help Ofwat to evaluate the impacts of the Innovation Fund in future years.

Please find a letter of introduction [here](#).

As part of the study, we are inviting regulated water companies and NAVs to respond to questions about:

- their own approach to and capacity for innovation
- the effectiveness of the wider innovation ecosystem for the water sector.

Your response will be treated in confidence. It will not be published or shared with Ofwat

The purpose of the survey is to establish a baseline for the whole sector. It is not to assess the performance of individual companies. The analysis of survey results will therefore be based on an aggregation of responses across all water companies. (A parallel survey of NAVs is being undertaken.)

The results of the survey will be analysed by CSES and will inform the final report of the study, which Ofwat will publish. The final report will draw on other evidence, such as interviews of water companies and NAVs and a review of documents (such as business plans of water companies). The report will not assess the performance of individual companies and will not include rankings of companies or league tables, although instances of good practice may be mentioned.

If you have any questions about the survey or the study or if you would like to complete the survey by email or post, please contact us at [enquiries@cses.co.uk](mailto:enquiries@cses.co.uk).

To enter the survey, please click on "Next" below.

Next

## 1. Information about the respondent

Question	Response
<p>1. To enter the survey, you must express your agreement with the statement on data protection and privacy relating to this survey, which is available <a href="#">here</a>.</p> <p>All survey data will be analysed anonymously and kept confidential. Your personal data will be kept only for the time necessary to fulfil the purpose of collection or further processing.</p> <p>We care about your data protection rights, so if you do not agree with the statement, you will exit the survey and no personal data will be collected.</p>	<ul style="list-style-type: none"> <li>• I AGREE with the statement on data protection and privacy relating to this survey</li> <li>• I DO NOT AGREE with the statement on data protection and privacy relating to this survey (EXIT SURVEY)</li> </ul>
2. What company do you represent?	<ul style="list-style-type: none"> <li>• Affinity Water</li> <li>• Anglian Water</li> <li>• Bristol Water</li> <li>• Dŵr Cymru Welsh Water</li> <li>• Hafren Dyfrdwy</li> <li>• Northumbrian Water</li> <li>• Portsmouth Water</li> <li>• SES Water</li> <li>• Severn Trent Water</li> <li>• South East Water</li> <li>• Southern Water</li> <li>• South Staffordshire Water</li> <li>• South West Water</li> <li>• Thames Water</li> <li>• United Utilities Water</li> <li>• Wessex Water</li> <li>• Yorkshire Water</li> </ul>
3. Please state your name	•
4. Please state your job title	•

## 2. Innovation assessment

Question	Response
<p><b>We would like to ask some questions about your company's approach to innovation prior to the Innovation Fund. As far as possible, please describe the situation in August 2020.</b></p>	
5. Prior to the Innovation Fund, did a named board member have responsibility for innovation?	<ul style="list-style-type: none"> <li>• Yes – board member solely dedicated to innovation</li> <li>• Yes – included in board member job title (but not solely innovation)</li> </ul>



	<ul style="list-style-type: none"> <li>• No – but a named senior manager was responsible for innovation (below board level)</li> <li>• No – there was no nominated board member or senior manager responsible for innovation</li> </ul>
6. Prior to the Innovation Fund, what staff were dedicated to innovation (in August 2020)?	<ul style="list-style-type: none"> <li>• Dedicated innovation unit</li> <li>• Dedicated innovation manager (full-time for innovation)</li> <li>• Nominated innovation manager (combined with other roles)</li> <li>• No nominated innovation staff</li> </ul>
7. Please state the number of staff in the innovation unit (full-time equivalents in August 2020).	
8. Prior to the Innovation Fund, to what extent did the management display an openness and responsiveness to innovation?	<ul style="list-style-type: none"> <li>• Board/senior management actively and consistently canvass, listen to and adopt innovative ideas and approaches</li> <li>• Board/senior management occasionally canvass, listen to and adopt innovative ideas and approaches</li> <li>• Ad hoc instances of board/senior management responding to innovative ideas and approaches, but in quite a passive way</li> <li>• Little/no evidence of management being open to innovations</li> </ul>
9. Prior to the Innovation Fund, to what extent was an innovative mindset fostered in the overall workforce (beyond those directly responsible for innovation)?	<ul style="list-style-type: none"> <li>• Comprehensive approach to fostering an innovative mindset amongst all staff</li> <li>• Innovative mindset consistently fostered amongst a (significant) subset of the workforce</li> <li>• Ad hoc instances of fostering an innovative mindset amongst staff</li> <li>• No particular effort to foster an innovative mindset amongst staff</li> </ul>
10. Prior to the Innovation Fund, what budgetary resources were dedicated to innovation (in August 2020)?	<ul style="list-style-type: none"> <li>• Dedicated innovation budget</li> <li>• Innovation explicitly included in a broader budget</li> <li>• Ad hoc items of innovation expenditure</li> <li>• No dedicated budgetary resources</li> </ul>
11. Please state the value of the innovation budget per annum or for the five-year PR19 period.	£
<b>We would like to ask some questions about your company's external collaborations around innovation prior to the Innovation Fund (i.e. August 2020).</b>	
12. Prior to the Innovation Fund, to what extent did the company collaborate with other	<ul style="list-style-type: none"> <li>• Extensive, structured and long-term multilateral collaboration or engagement</li> </ul>

<p>regulated water companies on sector-wide initiatives (e.g. fora, structures)?</p>	<p>with sector-wide innovation initiatives (e.g. in a leading role)</p> <ul style="list-style-type: none"> <li>• Regular multilateral collaboration or engagement with sector-wide innovation initiatives</li> <li>• Occasional or ad hoc multilateral collaboration or engagement with sector-wide innovation initiatives</li> <li>• No particular multilateral collaboration or engagement with sector-wide innovation initiatives</li> </ul>
<p>13. Prior to the Innovation Fund, to what extent did the company collaborate with other regulated water companies outside of sector-wide initiatives?</p>	<ul style="list-style-type: none"> <li>• Extensive, structured and long-term collaboration with two or more other regulated water companies around innovation</li> <li>• Extensive, structured and long-term collaboration with one other regulated water company</li> <li>• Occasional or ad hoc collaboration with other water companies</li> <li>• No particular bilateral collaborations around innovation</li> </ul>
<p>14. Prior to the Innovation Fund, to what extent did the company collaborate with suppliers around innovation (e.g. to canvass innovative technologies, use of data, development of IP, etc.)?</p>	<ul style="list-style-type: none"> <li>• Extensive, ongoing and regular collaboration with several suppliers around innovation</li> <li>• Ongoing collaboration with one supplier around innovation</li> <li>• Ad hoc collaboration with one supplier around innovation</li> <li>• No particular collaborations with suppliers around innovation</li> </ul>
<p>15. Prior to the Innovation Fund, to what extent did the company collaborate with research institutions, technology providers or similar around innovation (e.g. to canvass innovative technologies, use of data, development of IP, etc.)?</p>	<ul style="list-style-type: none"> <li>• Extensive, ongoing and regular collaboration around innovation</li> <li>• Ongoing collaboration with one body around innovation</li> <li>• Ad hoc collaboration with one body around innovation</li> <li>• No particular bilateral collaborations around innovation</li> </ul>
<p>16. Prior to the Innovation Fund, to what extent did the company collaborate with training and education providers around innovation (e.g. developing innovation training)?</p>	<ul style="list-style-type: none"> <li>• Extensive, ongoing and regular collaboration around innovation</li> <li>• Ongoing collaboration with one body around innovation</li> <li>• Ad hoc collaboration with one body around innovation</li> <li>• No particular bilateral collaborations around innovation</li> </ul>
<p>17. Prior to the Innovation Fund, to what extent did the company collaborate with local stakeholders around innovation (e.g. local</p>	<ul style="list-style-type: none"> <li>• Extensive, ongoing and regular collaboration around innovation</li> <li>• Ongoing collaboration with one body around innovation</li> </ul>

authorities, local business bodies, landowners)?	<ul style="list-style-type: none"> <li>• Ad hoc collaboration with one body around innovation</li> <li>• No particular bilateral collaborations around innovation</li> </ul>
18. Prior to the Innovation Fund, were successful pilot innovations rolled-out across the company?	<ul style="list-style-type: none"> <li>• Yes – structured process or regular practice of rolling out pilots across the company</li> <li>• Yes – one or more ad hoc instances of pilots rolled out across the company</li> <li>• Partial – ideas, learning or elements of pilots rolled out across the company</li> <li>• No</li> </ul>
19. Prior to the Innovation Fund, had innovations/ innovative projects from other water companies been adopted and rolled-out?	<ul style="list-style-type: none"> <li>• Yes – structured process or regular practice of adopting innovations from other companies</li> <li>• Yes – one or more ad hoc instances of adopting innovations from other companies</li> <li>• Partial – ideas, learning or elements of innovation adopted from other companies</li> <li>• No</li> </ul>

### 3. Innovation ecosystem in the water sector

Question	Response
<b>We would like to know your opinion on certain aspects of the wider innovation ecosystem for the water sector prior to the Innovation Fund (i.e. in August 2020).</b>	
20. Prior to the Innovation Fund, to what extent were regulated water companies (in general) collaborating with each other effectively around innovation?	<ul style="list-style-type: none"> <li>• To a great extent</li> <li>• To a reasonable extent</li> <li>• To a slight extent</li> <li>• Not at all</li> <li>• Don't know</li> </ul>
21. Prior to the Innovation Fund, to what extent were regulated water companies (in general) open to sharing data, insights and ideas to support innovation practices?	<ul style="list-style-type: none"> <li>• To a great extent</li> <li>• To a reasonable extent</li> <li>• To a slight extent</li> <li>• Not at all</li> <li>• Don't know</li> </ul>
22. Please offer any comments on collaboration on innovation between regulated water companies.	
23. Prior to the Innovation Fund, to what extent were regulated water companies effectively piloting and rolling out innovations within the same company?	<ul style="list-style-type: none"> <li>• To a great extent</li> <li>• To a reasonable extent</li> <li>• To a slight extent</li> <li>• Not at all</li> <li>• Don't know</li> </ul>
24. Prior to the Innovation Fund, to what extent were regulated water companies effectively adopting innovations from other water companies?	<ul style="list-style-type: none"> <li>• To a great extent</li> <li>• To a reasonable extent</li> <li>• To a slight extent</li> <li>• Not at all</li> <li>• Don't know</li> </ul>

25. Prior to the Innovation Fund, to what extent were (potential) suppliers to the regulated water companies developing / offering innovative new products and services?	<ul style="list-style-type: none"> <li>• To a great extent</li> <li>• To a reasonable extent</li> <li>• To a slight extent</li> <li>• Not at all</li> <li>• Don't know</li> </ul>
26. Prior to the Innovation Fund, to what extent were research institutes or universities generating new solutions of relevance to regulated water companies?	<ul style="list-style-type: none"> <li>• To a great extent</li> <li>• To a reasonable extent</li> <li>• To a slight extent</li> <li>• Not at all</li> <li>• Don't know</li> </ul>
27. Please offer any comments on the supply of innovative products, services or solutions to water companies by suppliers, technology providers or research institutes (prior to the Innovation Fund)?	
28. Prior to the Innovation Fund, to what extent were higher education and vocational training providers effectively incorporating an innovation dimension into relevant courses?	<ul style="list-style-type: none"> <li>• To a great extent</li> <li>• To a reasonable extent</li> <li>• To a slight extent</li> <li>• Not at all</li> <li>• Don't know</li> <li>• Not relevant – not needed by regulated water companies</li> </ul>
29. Prior to the Innovation Fund, to what extent could water companies access innovation-related training for their workforces?	<ul style="list-style-type: none"> <li>• To a great extent</li> <li>• To a reasonable extent</li> <li>• To a slight extent</li> <li>• Not at all</li> <li>• Don't know</li> <li>• Not relevant – not needed by regulated water companies</li> </ul>
30. Please offer any comments on the provision of innovation-related education and training for regulated water companies.	
31. To what extent is regulation of the water sector supportive of innovation (not including Ofwat's Innovation Fund)?	<ul style="list-style-type: none"> <li>• To a great extent</li> <li>• To a reasonable extent</li> <li>• To a slight extent</li> <li>• Not at all</li> <li>• Don't know</li> </ul>
32. Aside from the Innovation Fund, to what extent are regulated water companies able to securing financing for innovations (e.g. grants, equity, debt, loan guarantees)?	<ul style="list-style-type: none"> <li>• To a great extent</li> <li>• To a reasonable extent</li> <li>• To a slight extent</li> <li>• Not at all</li> <li>• Don't know</li> </ul>
33. Please offer any comments on the regulatory, policy and financing environment for innovation in the water sector.	
<b>Thank you for your participation in the survey. Your input will help us produce a well-informed report for Ofwat.</b>	

## Water company interview questionnaire

### 1. Interviewee details

	Interviewee
Name	
Organisation	
Role	

### 2. The company's approach to innovation

Question
<b>Corporate innovation commitment and capabilities</b>
<p><b>1 Please describe the company's approach to innovation, including:</b></p> <ul style="list-style-type: none"> <li>- Innovation objectives</li> <li>- KPIs for innovation</li> <li>- Responsibilities for innovation at board level</li> <li>- Staff and budgets dedicated to innovation</li> <li>- Innovation culture and mindset within management and workforce</li> </ul>
<b>Collaborations around innovation</b>
<p><b>2 To what extent does the company collaborate with other regulated water companies on a bilateral basis? (excluding sector-wide initiatives, fora, structures, etc.)</b></p>
<p><b>3 To what extent does the company engage with:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Spring</a> Centre of Excellence?</li> <li>• <a href="#">UK Water Industry Research</a></li> </ul>
<p><b>4 To what extent does the company collaborate with other regulated water companies on a multilateral basis? (e.g. sector-wide initiatives, fora, structures, etc.)</b></p>
<p><b>5 To what extent does the company collaborate with suppliers around innovation (e.g. to canvass innovative technologies, use of data, development of IP, etc.)?</b></p>
<p><b>6 To what extent does the company collaborate with research institutions, technology providers or similar around innovation (e.g. to canvass innovative technologies, use of data, development of IP, etc.)?</b></p>
<p><b>7 To what extent does the company collaborate with training and education providers around innovation (e.g. developing innovation training)?</b></p>
<b>Innovation activities</b>
<p><b>8 Are there examples of current or recent innovative activities and projects in the following fields?</b></p> <ul style="list-style-type: none"> <li>• Research and development</li> <li>• Engineering or infrastructure</li> <li>• Public engagement/campaigns</li> <li>• Staff training and development</li> <li>• Software or database development</li> <li>• New uses of data</li> </ul>

Question
• Other
9 Have successful pilot innovations developed been rolled-out across the company?
10 Have innovations/innovative projects from other water companies been adopted and rolled-out recently?

### 3. Innovation ecosystem for the water sector

Question
11 To what extent do water companies benefit from having suppliers that provide innovative products or services?
12 To what extent is the tax and regulation environment supportive of innovation in the sector?
13 To what extent is the research and higher education sector supportive of innovation in the water sector?
14 To what extent is the education and training sector supportive of innovation in the water sector? (e.g. incorporating innovation into education and training, availability of workforce training relating to innovation)?

## Water company assessment template

To be completed on the basis of:

- Review of business plan, innovation strategy or other document
- Interview of innovation contact person
- Any other evidence, e.g. website of the company or its partners in innovation

For each question:

- Select a response option (delete other options)
- Provide supporting evidence, extracts (e.g. from business plans) or comments

Question
<b>Corporate innovation commitment and capabilities</b>
<b>1 Does innovation feature within the high-level objectives stated in the business plan?</b>
<ul style="list-style-type: none"> <li>• Yes – prominent and explicit</li> <li>• Yes – present but not prominent</li> <li>• Partially – e.g. implied</li> <li>• Not at all</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>2 Does the business plan feature a section dedicated to innovation?</b>
<ul style="list-style-type: none"> <li>• Dedicated section - featuring a comprehensive and strategic approach</li> <li>• Dedicated section - featuring a few ad hoc activities</li> <li>• Not a dedicated section – but elements of innovation feature in other sections</li> <li>• Not at all</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>3 Does the business plan feature Key Performance Indicators (KPIs) directly linked to innovation?</b>
<ul style="list-style-type: none"> <li>• Yes – comprehensive and high-level</li> <li>• Yes – a few but not high-level</li> <li>• Partially – e.g. implied in other indicators</li> <li>• Not at all</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>4 Does a named board member or senior staff member have responsibility for innovation?</b>
<ul style="list-style-type: none"> <li>• Yes – board member solely dedicated to innovation</li> <li>• Yes – included in board member job title (but not solely innovation)</li> <li>• Partial – named senior manager responsible for innovation (below board level)</li> <li>• Not at all</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>5 What staff are dedicated to innovation?</b>
<ul style="list-style-type: none"> <li>• Dedicated innovation unit – <i>state number of staff</i></li> <li>• Dedicated innovation manager (full-time for innovation)</li> <li>• Nominated innovation manager (combined with other roles)</li> <li>• No nominated innovation staff</li> </ul>



Question
EVIDENCE / EXTRACT / COMMENT [NB: compare to size of total workforce]:
<b>6 What budgetary resources are dedicated to innovation?</b>
<ul style="list-style-type: none"> <li>• Dedicated innovation budget – <i>state value</i></li> <li>• Innovation explicitly included in a broader budget</li> <li>• Ad hoc items of innovation expenditure</li> <li>• No dedicated budgetary resources</li> </ul>
EVIDENCE / EXTRACT / COMMENT [NB: compare to total turnover]:
<b>7 To what extent does the management display an openness and responsiveness to innovation?</b>
<ul style="list-style-type: none"> <li>• Board/senior management actively and consistently canvass, listen to and adopt innovative ideas and approaches</li> <li>• Board/senior management occasionally canvass, listen to and adopt innovative ideas and approaches</li> <li>• Ad hoc instances of board/senior management responding to innovative ideas and approaches, but in quite a passive way</li> <li>• Little/no evidence of management being open to innovations</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>8 To what extent is an innovative mindset fostered in the overall workforce (beyond those directly responsible for innovation)?</b>
<ul style="list-style-type: none"> <li>• Comprehensive approach to fostering an innovative mindset amongst all staff</li> <li>• Innovative mindset consistently fostered amongst a (significant) subset of the workforce</li> <li>• Ad hoc instances of fostering an innovative mindset amongst staff</li> <li>• No particular effort to foster an innovative mindset amongst staff</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>Collaborations around innovation</b>
<b>9 To what extent does the company collaborate with other regulated water companies on a bilateral basis? (excluding sector-wide initiatives, fora, structures, etc.)</b>
<ul style="list-style-type: none"> <li>• Extensive, structured and long-term bilateral collaboration with two or more other regulated water companies around innovation</li> <li>• Extensive, structured and long-term bilateral collaboration with one other regulated water company</li> <li>• Recent occasional or ad hoc bilateral collaboration with other water companies</li> <li>• No particular recent bilateral collaborations around innovation</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>10 To what extent does the company collaborate with other regulated water companies on a multilateral basis? (e.g. sector-wide initiatives, fora, structures, etc.)</b>
<ul style="list-style-type: none"> <li>• Extensive, structured and long-term multilateral collaboration or engagement with sector-wide innovation initiatives (e.g. in a leading role)</li> <li>• Regular multilateral collaboration or engagement with sector-wide innovation initiatives</li> <li>• Recent occasional or ad hoc multilateral collaboration or engagement with sector-wide innovation initiatives</li> <li>• No particular recent multilateral collaboration or engagement with sector-wide innovation initiatives</li> </ul>
EVIDENCE / EXTRACT / COMMENT:

Question
<b>11 To what extent does the company collaborate with suppliers around innovation (e.g. to canvass innovative technologies, use of data, development of IP, etc.)?</b>
<ul style="list-style-type: none"> <li>• Extensive, ongoing and regular collaboration with several suppliers around innovation</li> <li>• Ongoing collaboration with one supplier around innovation</li> <li>• Recent ad hoc collaboration with one supplier around innovation</li> <li>• No particular recent collaborations with suppliers around innovation</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>12 To what extent does the company collaborate with universities, research institutions, technology providers or similar around innovation (e.g. to canvass innovative technologies, use of data, development of IP, etc.)?</b>
<ul style="list-style-type: none"> <li>• Extensive, ongoing and regular collaboration around innovation</li> <li>• Ongoing collaboration with one body around innovation</li> <li>• Recent ad hoc collaboration with one body around innovation</li> <li>• No particular recent bilateral collaborations around innovation</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>13 To what extent does the company collaborate with training and education providers around innovation (e.g. developing innovation training)?</b>
<ul style="list-style-type: none"> <li>• Extensive, ongoing and regular collaboration around innovation</li> <li>• Ongoing collaboration with one body around innovation</li> <li>• Recent ad hoc collaboration with one body around innovation</li> <li>• No particular recent bilateral collaborations around innovation</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>14 To what extent does the company collaborate with local stakeholders around innovation (e.g. local authorities, local business bodies, landowners)?</b>
<ul style="list-style-type: none"> <li>• Extensive, ongoing and regular collaboration around innovation</li> <li>• Ongoing collaboration with one body around innovation</li> <li>• Recent ad hoc collaboration with one body around innovation</li> <li>• No particular recent bilateral collaborations around innovation</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>Innovation activities</b>
<b>15 Are there examples of current or recent innovative activities and projects in the following fields?</b>
• <b>Research and development: Yes/No</b>
EVIDENCE / EXTRACT / COMMENT:
• <b>Engineering or infrastructure: Yes/No</b>
EVIDENCE / EXTRACT / COMMENT:
• <b>Public engagement/campaigns: Yes/No</b>
EVIDENCE / EXTRACT / COMMENT:
• <b>Staff training and development: Yes/No</b>
EVIDENCE / EXTRACT / COMMENT:
• <b>Software or database development: Yes/No</b>
EVIDENCE / EXTRACT / COMMENT:

Question
<ul style="list-style-type: none"> <li>• <b>New uses of data: Yes/No</b></li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<ul style="list-style-type: none"> <li>• <b>Other: Yes/No</b></li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>16 Have successful pilot innovations developed been rolled-out across the company?</b>
<ul style="list-style-type: none"> <li>• Yes – structured process or regular practice of rolling out pilots across the company</li> <li>• Yes – one or more ad hoc instances of pilots rolled out across the company</li> <li>• Partial – ideas, learning or elements of pilots rolled out across the company</li> <li>• No</li> </ul>
EVIDENCE / EXTRACT / COMMENT:
<b>17 Have innovations/innovative projects from other water companies been adopted and rolled-out recently?</b>
<ul style="list-style-type: none"> <li>• Yes – structured process or regular practice of adopting innovations from other companies</li> <li>• Yes – one or more ad hoc instances of adopting innovations from other companies</li> <li>• Partial – ideas, learning or elements of innovation adopted from other companies</li> <li>• No</li> </ul>
EVIDENCE / EXTRACT / COMMENT: