



Welsh Water  
PR19 Resilience in the Round review  
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ARUP

 Dŵr Cymru  
Welsh Water

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## Executive summary

### Welsh Water's resilience journey

Welsh Water was one of the first water companies in the UK to undertake a comprehensive assessment of their resilience across their business.

In early 2017, Welsh Water developed their Resilience Wheel, which was used to underpin their long-term strategy, Welsh Water 2050.

From this work, Welsh Water has a good understanding of the risks posed by a range of short-term shocks, such as the 2007 floods, or Storm Emma in 2018, as well as long-term chronic stresses. Working in collaboration with Arup and Cardiff University, Welsh Water carried out horizon-scanning research to understand how these shocks and stresses would change over time.

The uncertainty associated with some of these key challenges, such as climate change, resource depletion and population change, make the case for Welsh Water to embrace resilience, which Welsh Water describes as “*the capacity of individuals, communities, institutions, businesses, and systems to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience*”.

Welsh Water has also identified eight key future trends: change in customer expectations, protecting essential infrastructure, demographic change, changes to the structure of the economy, policy and

regulatory change, climate change, environmental change, and protecting public health.

Welsh Water's Resilience Wheel was developed before guidance from Ofwat on 'Resilience in the Round' and the final PR19 methodology were published. In line with the guidance in these documents, Welsh Water's Resilience Wheel takes a systems-level approach to resilience. The Resilience Wheel is divided into three core parts: finance and governance, infrastructure and environment and people.

This maps well to the financial, corporate and operational resilience that form the cornerstone of Ofwat's approach, and also includes the focus that resilience in the round puts on the purpose of resilience, which is ultimately for the benefit of customers and the environment.

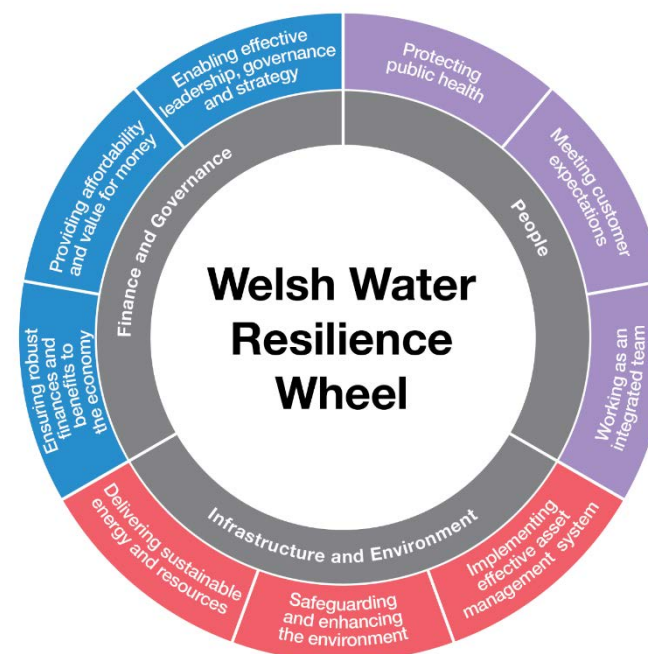
### Resilience now and next

In support of the development of their PR19 plan, Welsh Water has commissioned Arup to review Welsh Water's Resilience Wheel against Ofwat's requirements and to provide an update to their resilience assessment.

This report sets out the findings of this updated assessment; incorporating the activities they have undertaken in AMP6 and their plans for AMP7.

### Findings of the maturity assessment

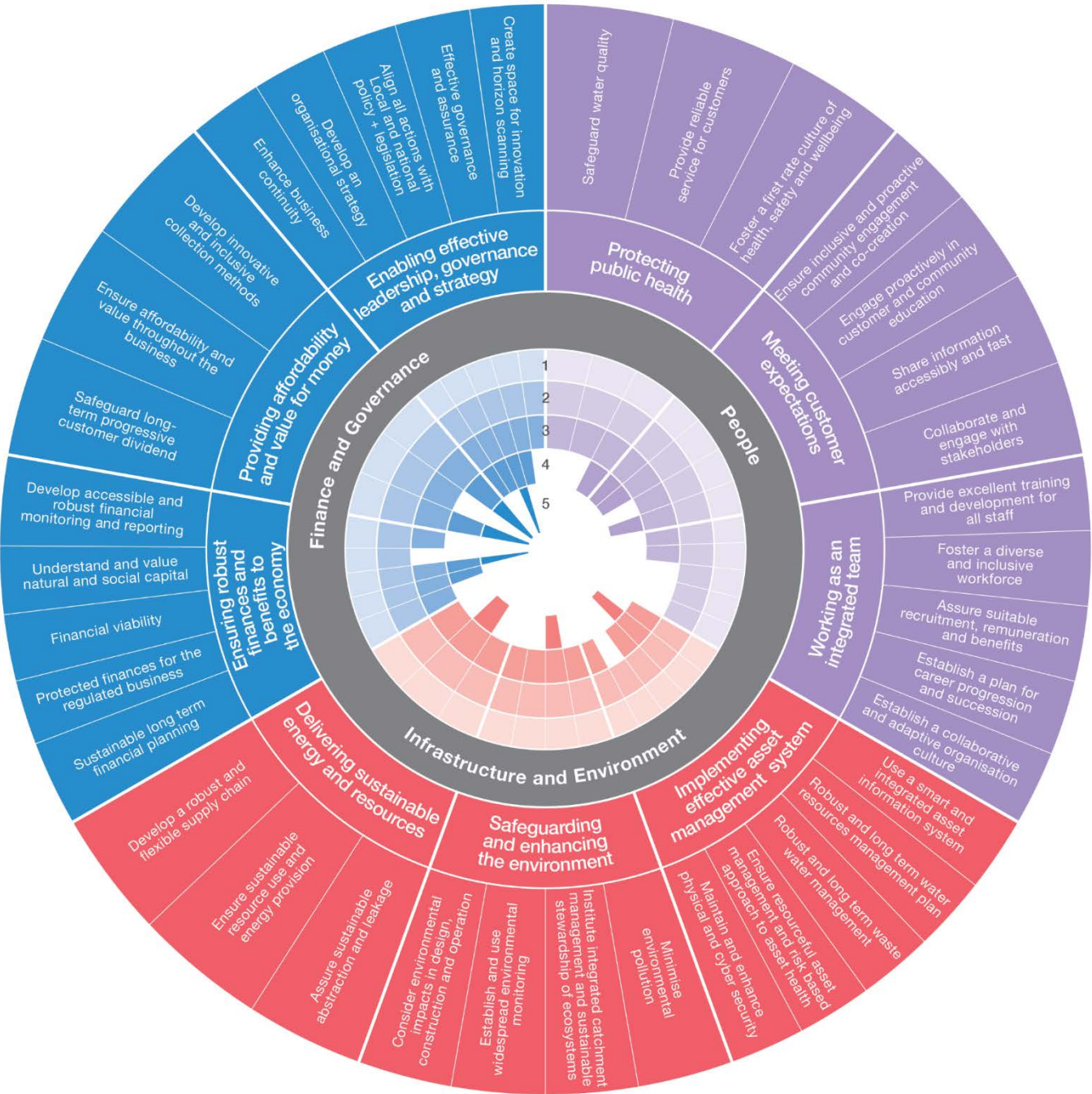
The findings of the assessment are summarised in the diagrams overleaf.





Executive summary

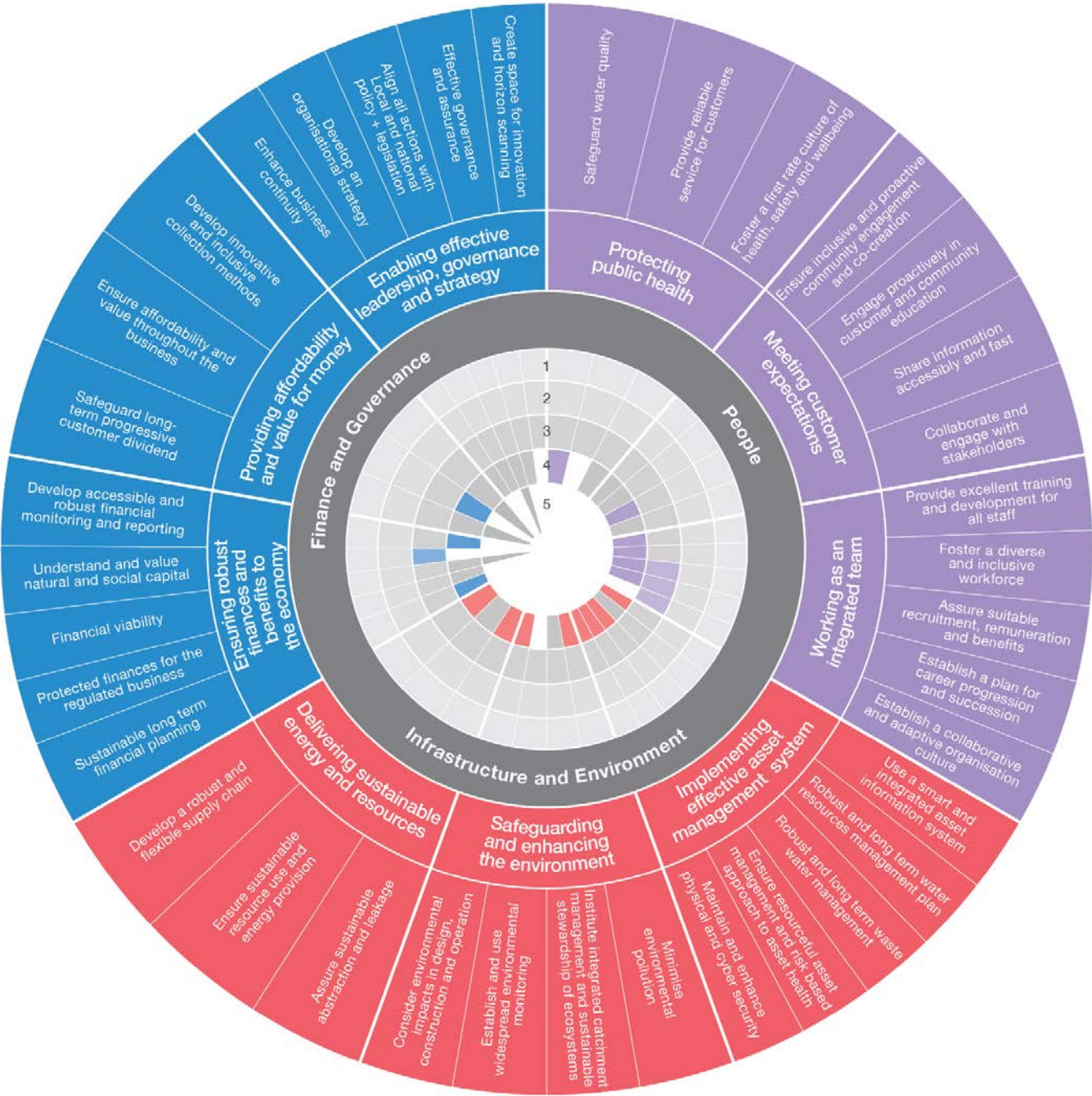
Current resilience  
score



Executive summary

Future resilience score

Current resilience scores are shown in grey, with improvements in AMP7 and beyond shown in colour.



			Level 5 Leading
			Level 4 Response in progress
			Level 3 Response developed
			Level 2 Aware a response should be developed
			Level 1 Unaware of indicator



## Executive summary

### Strengths

Welsh Water's not-for-profit business model enables the company to think long term and re-invest or distribute profits to allow less well-off customers to pay lower bills. The company has developed Welsh Water 2050, which demonstrates its leading thinking on resilience for future generations. This plan was developed collaboratively with stakeholders and customers. In developing shorter-term plans aligned to long-term strategy, Welsh Water has ensured that short-term risk can be managed in a way that supports the long-term needs. Some of the wider strengths that this has enabled are:

#### People

- System-wide improvements are in progress to improve poor water quality acceptability and ensure that water quality can be maintained in the future.
- Expanding network monitoring following Storm Emma to improve prior warning, response and recovery and to target actions.
- Communication during Storm Emma was recognised as good practice by Ofwat, showing inclusivity and flexibility.
- Good standard of health and safety management in place for current risks and there is good work in progress in the wellbeing arena, showing robust well managed systems.
- Wide reaching community engagement, interaction with young people and close

relationship with Customer Challenge Group. Examples include projects such as Rhondda Fach water resilient communities and Project Cartref, showing inclusiveness and integration.

- Wide-ranging campaigns to support customer education, such as "Wrap up Wales", "Let's Stop the Block" and "One Last Breath", these schemes are reflective and inclusive, giving ownership for decision making to the community.
- Development of tools to better understand data from customer feedback, and potentially opening up data, leading to alternative resource use and integration of distinct systems.
- Positive, collaborative programmes to encourage diversity. For example, Network75 is inclusive and supports the recruitment of people from less traditional backgrounds.
- The Welsh Water apprenticeship and graduate programmes are well regarded, developing key capability in-house. For example, Welsh Water is the first company to sponsor an innovative new university in Hereford, linked to capital investment and delivering skills for the future. This is to create a robust skills base, with potential for redundancy.

#### Infrastructure and Environment

- There is a Smart Strategy in place with a comprehensive plan for technology and cyber development and future implementation, this adoption of alternative strategies shows an ability to

respond to changing circumstances.

- Work to reduce pollution of water sources is in progress, this includes measures such as the WaterSource programme, including the Brecon Beacons Mega Catchment (BBMC), Weed Wiper and PestSmart. These measures are reflective and flexible, improving the organisation's resilience by education land owners.
- Future plans for catchment management with regards to Central Cardiff Flooding and sustainable management of natural resources (SMNR), are inclusive and show flexibility to approaches in catchment management.
- Sustainable energy generation is becoming integrated into business as usual, and energy efficiency and biodiversity is starting to become part of the Gateway process, which means that resilience is considered earlier.
- Project Cartref and 'Wrap up Wales' are inclusive programmes, to help customers reduce leakage to meet the 15% leakage target in AMP7.
- The future plan to develop services for proactive monitoring and modelling of air quality and odour is progressive and integrated, investigations into sharing data with other bodies allows for collaboration and shared ownership of decision making.
- Research is being undertaken to develop a system-wide approach to asset health, this integration of assets should lead to more resilient and robust systems.

### Finance and Governance

- Not-for-profit, dividend business model enables the company to think long term and re-invest or distribute profits to enable less well-off customers to pay lower bills. For example, following the identification of a surplus in 2016, Welsh Water engaged with customers to inform investment in additional storage, flood protection, a new visitor centre and an increased spend on social tariffs.
- One of the leading water companies for Financial Viability with the highest credit rating (Moody's A2 Stable) and lowest gearing ratio in the water sector. This helps it meet the Ofwat 2018d combined downside scenario.
- Licence and bondholder Common Terms Agreement adds considerable additional requirements to make sure the company does not overextend itself, e.g. the obligation to have at least 12 months of liquidity
- Sustainable long-term organisational strategy (Welsh Water 2050), looking forward to the next 30 years. This strategy is well aligned with current policy, legislation and guidance including the Well-being for Future Generations Act (Wales) (WFGA). The investment strategy for AMP7 is also well aligned with the 2050 strategy.
- Good innovation processes to capture new ideas, which allow flexibility and show a willingness to adopt new thinking and methods of working.

## Executive summary

### Opportunities for enhancements

Developing an approach for a business to integrate resilience thinking into what it does, and prepares for, needs to be continually updated. This is because the future can be uncertain and a business needs to learn from events that happen and develop and adapt its approach. Some of the opportunities identified through this assessment are:

#### People

- Potential to expand real-time monitoring of the network and link to network management to improve integration and flexibility.
- Opportunity to improve internal data sharing and communication, including integration of systems.
- Community education and outreach programmes are often project specific or linked to education centres, so there is an opportunity to expand this to be more inclusive, reaching a broader audience. This would benefit from learning from and embedding the Water Resilient Communities approach.
- Opportunity to map strategic stakeholders and strengthen partnerships with third parties following on from the consultation and publication of Welsh Water 2050, which sets out who Welsh Water might partner with to advance their strategic responses.

- Opportunity to be more explicit in horizon scanning and for long-term planning for a workforce fit for the future, adapting the business to respond to future needs.
  - Opportunity to develop stronger communication and more collaborative culture across the business, the supply change and key stakeholders e.g. Welsh Water 2050 could be communicated more widely to colleagues across the business to create a culture of collaboration internally and externally.
  - Opportunity to connect the PR19 Business Plan, strategic workforce planning outcomes and the training and development agenda more directly to integrate a range of distinct plans.
  - Opportunity to connect and leverage examples of good practice on recruitment across the business to build a adaptive workforce.
  - Delivery of greater flexibility and integration from long-term thinking across the business could be achieved through the development of a cultural change programme aligned to its Vision Welsh Water 2050 and PR19.
- #### Infrastructure and Environment
- Supplementing current plans with investment in people and processes to deliver the plans particularly relevant to the smart and cyber changes, but also across the business.
  - Ensuring that if pilots are successful, plans are created to roll them out, and that the geographical scale is sufficient to meet the requirements of the Drainage and Wastewater Management Plans (DWMPs).
  - There is an opportunity to test the draft Water Resources Management Plan (dWRMP) with real scenarios and longer planning horizons.
  - Review of the Strategic Asset Management Plan (SAMP) to include resilience plans and processes and to look at system-wide approaches rather than resilience of individual assets in isolation, inclusion of update and review process for document.
  - Opportunity to embrace more shared and open data approaches to support collaborative working with stakeholders, for example, combining Natural Resources Wales (NRW) data with Welsh Water data on a platform so that it can be used as part of the business as usual decision-making process for joint decisions.
  - Further consideration of environmental enhancements, including rolling out Biodiversity Champions more widely and collecting a more comprehensive dataset.
  - Opportunity to enhance the robustness of the skills supply chain and to share business wide future procurement needs over a longer time period with the supply chain.

### Finance and Governance

- Welsh Water 2050 has high-level expenditure plans until 2050. Further detailed planning for AMP8 and AMP9 would be valuable, ensuring that planned maintenance and refurbishment of assets is sufficient to avoid backlogs building up and overall network asset health deteriorating.
- Thought could also be given to modelling more 'severe but reasonable' downside sensitivities, and developing strategies to be able to quickly flex social tariffs should unexpected shocks occur.
- Welsh Water 2050 represents a leading approach to long-term strategy development and more could be done to truly embed this within the business.
- Opportunities to further embed innovation by increasing people and culture change to support processes to enable fail fast approaches. Additionally, better connections to business as usual could increase the flexibility to innovate.
- Further opportunities for developing accounting of natural and social capital could influence project-level decision-making to make new assets and systems become more resilient.
- Building on the Rhondda Fach Water Resilient Community pilot, to support more customers to access the social tariff, could enable Welsh Water to become leading in this area.

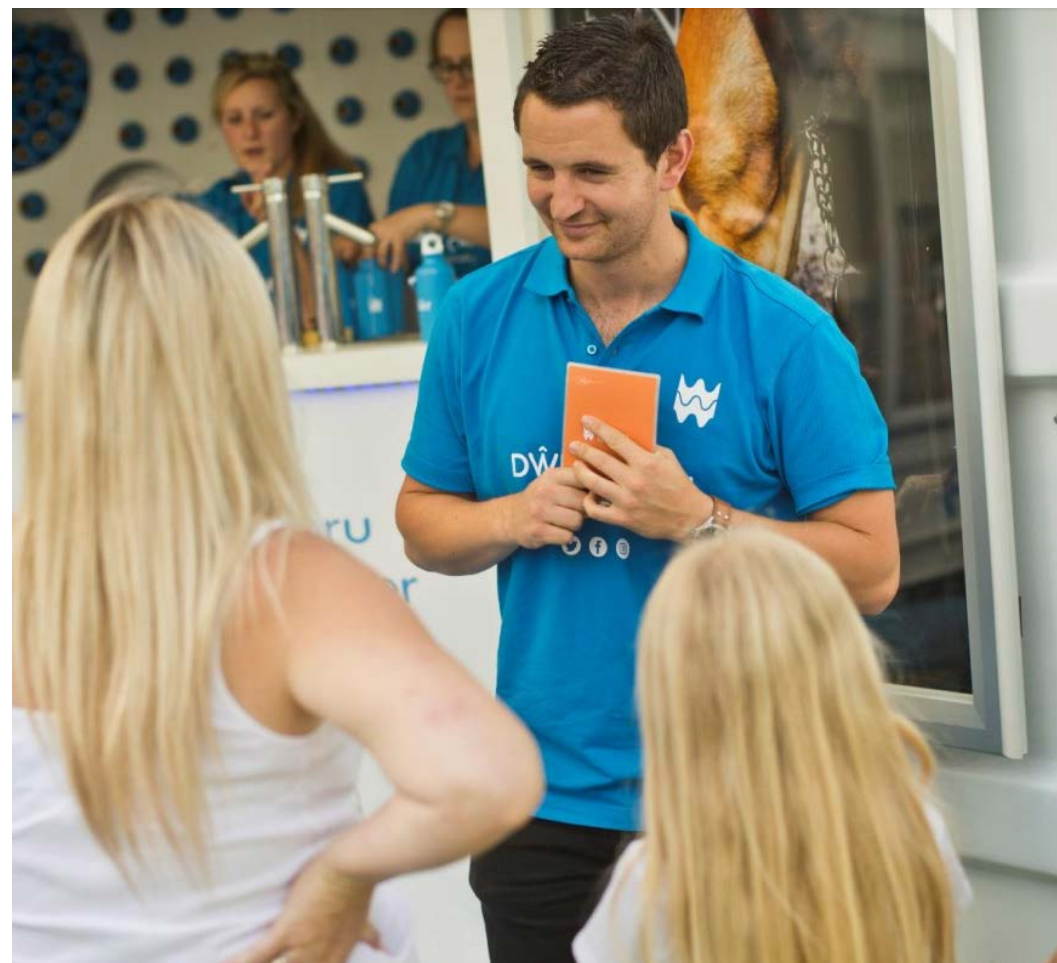
## Executive summary

### Next steps

We recommend that resilience should be an integrated theme throughout Welsh Water's business plan. Using Welsh Water 2050 to align long-term strategies, plans and expenditure with nearer-term plans will be an important mechanism to support this.

In order to capture the benefits from the good work started, we recommend that Welsh Water develops a change programme to embed long-term resilient thinking across the organisation, and improve its adaptability to deal with uncertainty and change.

There are a number of specific steps that could be taken to improve Welsh Water's maturity under the three key themes of people, infrastructure and environment and governance and finance.





## 1. Purpose and background

### Purpose of this report

The regulated water company Dŵr Cymru Cyfyngedig (hereafter Welsh Water) commissioned Arup to carry out a semi-independent review of resilience in order to provide evidence to support Welsh Water's PR19 submission.

In this report, Arup will:

- Compare Welsh Water's resilience framework with the latest Ofwat guidance
- Carry out an updated resilience assessment using the Resilience Wheel of Welsh Water's current resilience maturity
- Carry out a review of the potential future resilience based on planned AMP7 activities.

### Report structure

The remainder of this report is structured as follows:

- **Section 2** provides an overview of how Welsh Water has considered resilience over time, and provides the comparison between Welsh Water's Resilience Wheel and Ofwat's guidance. This section concludes with some recommendations for improvements to the wheel to make the alignment with Ofwat guidance clearer.

- **Section 3** presents the Welsh Water Resilience Wheel and assessment framework for an updated assessment of Welsh Water's resilience.
- **Sections 4-6** set out the results of the revised resilience assessment, including an anonymised benchmark against other UK water companies' performance.
- **Section 7** provides a summary of the conclusions from this updated assessment.

### Background

In early 2017, Arup worked with Welsh Water to create the Welsh Water Resilience Wheel and used this resilience framework to identify their areas of strength and areas of improvement. This was taken as a basis to create the company's long-term strategy, Welsh Water 2050.

Since this has been produced, Ofwat has developed its guidance on this topic. Of particular relevance are:

- 'Resilience in the Round', published in September 2017. This document sets out some ways companies might respond to the resilience challenge, though it explicitly encourages companies to innovate in how they approach resilience planning.

- Ofwat's final PR19 methodology, published in December 2017, in particular, Chapter 5, on securing long-term resilience, and Appendix 4: Resilience.

This regulatory framework provides an additional rationale for considering resilience at a strategic level now, alongside the global trends and challenges identified by Welsh Water in Welsh Water 2050.

Although there are several different working definitions of resilience, Welsh Water's original assessment has a working definition based on 100 Resilient Cities which was:

*"Resilience is the capacity of individuals, communities, institutions, businesses, and systems to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience."*

This review will use the same definition.

Welsh Water has also considered the shocks and stresses that they might be exposed to. These challenges are considered from both a resilience and a risk point of view. Traditional risk management is often focused on shocks, which are short term disruptive events, for example floods, fires or cyber attacks. Resilience considers both shock events and stresses, which are chronic conditions that weaken the function of systems in the long

term. These could be demographic change, ageing infrastructure or climate change.

Welsh Water collaborated with the University of Cardiff to create a long list of shocks and stresses and the potential impact of these on their organisations.

Further background to the definitions, guidance, background, and the long list of shocks and stresses, used in this 2017 work is set out in appendix A.



## 2. Welsh Water's resilience journey

### Welsh Water's original Resilience Wheel

In early 2017, Welsh Water, working with Arup, developed and published the Welsh Water Resilience Wheel (Figure 1). Cardiff University undertook an in-depth literature review of the key resilience challenges that Welsh Water will face in the future. This research, combined with an understanding of global resilience good practice and Welsh Water's legislative and regulatory context was the basis of their Resilience Wheel.

Welsh Water's objective in creating the Resilience Wheel was to identify future trends and areas of strength and vulnerability across the business.

The Welsh Water Resilience Wheel which was used to assess Welsh Water's resilience in 2017 has three dimensions: finance and governance, people, and infrastructure and environment.

Under these themes, topics are split into themes and sub-themes, as shown in Figure 1, to the right.

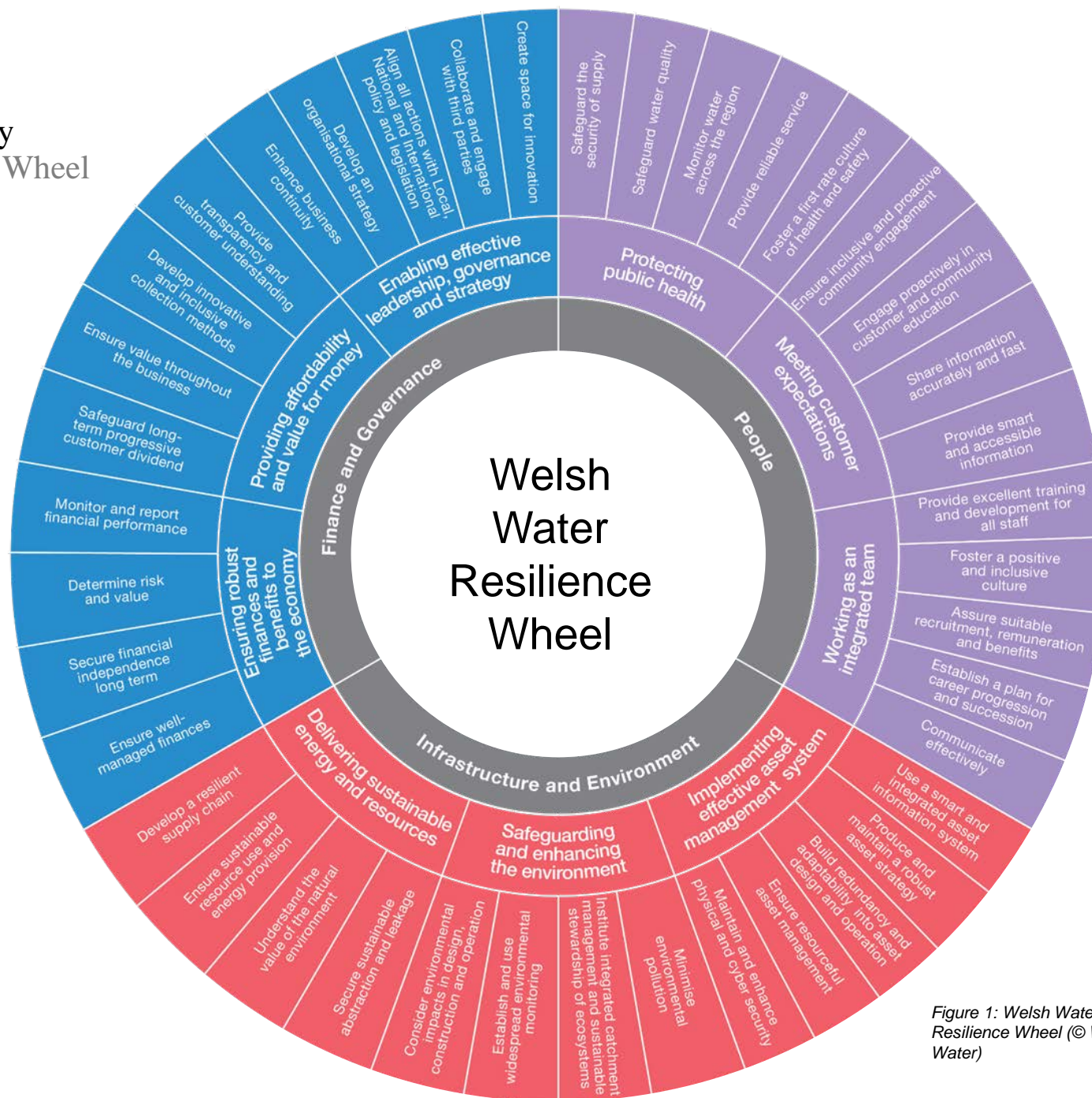


Figure 1: Welsh Water's 2017 Resilience Wheel (© Welsh Water)

## 2. Welsh Water's resilience journey

### Overview of resilience in the round

#### Ofwat's Resilience in the round

Ofwat's definition is '*Resilience is the ability to cope with, and recover from, disruption and anticipate trends and variability in order to maintain services for people and protect the natural environment now and in the future.*'

Ofwat published their 'Resilience in the Round' report in September 2017 (Ofwat 2017b), which advises that resilience in the round should be at the core of how companies approach the resilience challenge. However, it also emphasises that companies should create their own approach to resilience planning. Furthermore, the report expands on the three resilience themes introduced in the PR19 draft methodology in July 2017 (Ofwat, 2017c):

**Corporate resilience:** the ability of an organisation's governance, accountability and assurance processes to help avoid, cope with, and recover from, disruption; and to anticipate trends and variability in its business operations.

- **Financial resilience:** an organisation's ability to avoid, cope with, and recover from, disruption to its finances.
- **Operational resilience:** the ability of an organisation's infrastructure, and the skills

to run that infrastructure, to avoid, cope with, and recover from, disruption in its ability to provide critical services to customers.

In addition, Ofwat has provided an illustration of what resilience might look like, which includes subjects such as:

- Systems thinking
- An environmental foundation
- Customers at the heart of resilience
- Smart approaches to resilience
- Monitoring and measuring resilience.

#### Ofwat guidance: PR19 methodology

In December 2017, Ofwat published guidance on resilience in their PR19 consultation document. This includes the concept of 'Resilience in the Round' and recommends that customers should be the focus of the business, while also including the three resilience themes mentioned above. This is shown in Figure 2.

In addition, Ofwat has identified seven resilience planning principles (Ofwat, 2017b):

- Protecting public health
- A naturally resilient water sector
- Customer engagement

- Broad consideration of intervention options
- Delivering best value solutions for customers
- Outcomes and customer-focused approach
- Board assurance and sign-off.

Ofwat has also identified two Initial Assessment of Plans tests (IAP tests) that relate to resilience:

1. How well has the company used the best available evidence to objectively assess and prioritise the diverse range of risks and consequences of disruptions to its systems and services, and engaged effectively with customers on its assessment of these risks and consequences?
2. How well has the company objectively assessed the full range of mitigation options and selected the solutions that represent the best value for money over the long term and has the support from customers?

#### How Welsh Water has incorporated resilience thinking

Both the 'Resilience in the Round' report and the PR19 methodology highlight many of the

concepts that fundamental underpin Welsh Water's approach. For example, the concept of the "resilience dividend" that Welsh Water explored in its original approach is highlighted.

The 100 Resilient Cities programme is also highlighted as an important learning opportunity for water companies in terms of systems thinking. This is learning that Welsh Water has already drawn from, including visits with a number of the cities, such as New York, US and Vejle, Denmark.

Welsh Water's RainScope approach is highlighted as an example of best practice for embedding an environmental foundation to resilience.

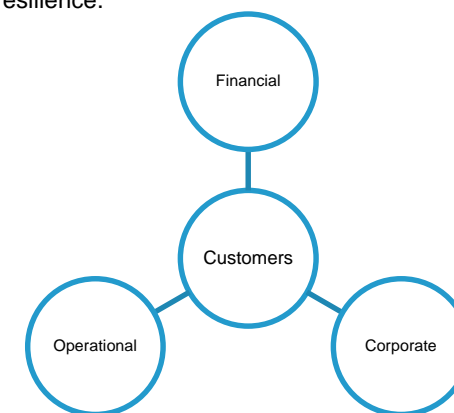


Figure 2: Resilience in the Round from Ofwat, Delivering Water 2020



## 2. Welsh Water's resilience journey

### Overview and resilience in the round

Following the development of the Welsh Water Resilience Wheel, Ofwat published Resilience in the Round (Ofwat, 2017a) and more recently their final PR19 guidance Delivering Water 2020 (Ofwat, 2017b). In these, as previously mentioned, Ofwat identified three key areas of resilience focus for PR19 and beyond that include financial, operational and corporate resilience with customers at the heart (shown in Figure 2).

Following Ofwat's publication of Resilience in the Round and the PR19 methodology (Ofwat, 2017a,b), Arup developed a framework to assess companies resilience based on the components of financial, operational and corporate. This framework is shown in Figure 3.

These recent publications provide a timely opportunity to revisit the Welsh Water Resilience Wheel and ensure that it is aligned with Ofwat's resilience in the round framework. As Welsh Water's planned activities for AMP7 are also due to change based on these new insights, their maturity assessment for the future needs to be updated.

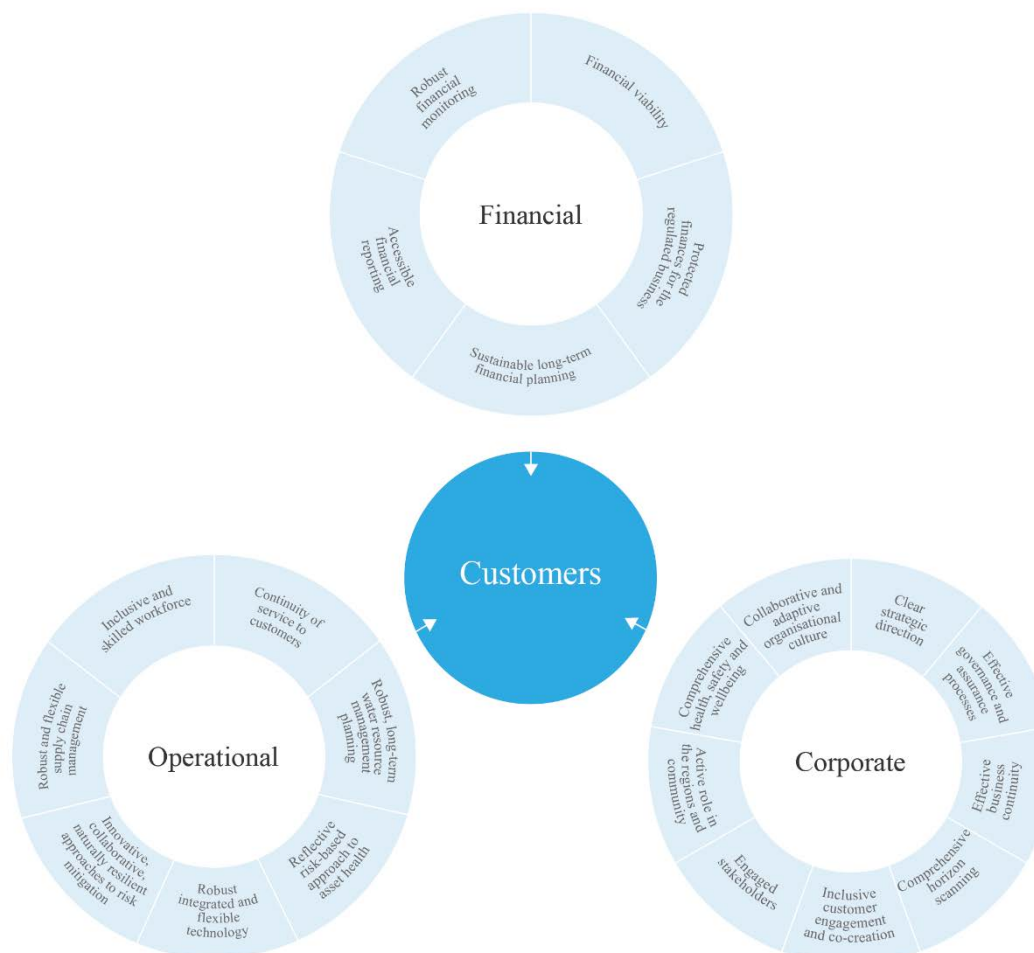


Figure 3: Arup's Water Resilience Framework

## 2. Welsh Water's resilience journey

### Comparison of approaches

Welsh Water developed its Resilience Wheel in early 2017, with Ofwat releasing its 'Resilience in the Round' guidance a few months later in July 2017. This section compares the Welsh Water Resilience Wheel with that of Ofwat's Resilience in the Round guidance (Ofwat 2017a,b). This identifies where there are similarities, strengths and gaps between approaches. This comparison has been used to inform the development of the Welsh Water Resilience Wheel further to align with current regulatory expectations.

#### Core resilience assessment values

Considering the core values of the Resilience Wheel, the Welsh Water approach considers infrastructure and environment, people and finance and governance (Welsh Water, 2018a). These broadly align with Ofwat's guidance.

Also in line with this guidance, Welsh Water's Resilience Wheel takes a systems-level approach to resilience. The Resilience Wheel is divided into three core parts; finance and governance, infrastructure and environment and people.

This maps well to the financial, corporate and operational resilience that form the cornerstone of Ofwat's approach, and also includes the focus that Resilience in the Round puts on the purpose of resilience, which is ultimately for the benefit of customers and the environment.

Resilience in the Round highlights the need for companies to learn from elsewhere in developing their approaches to resilience. It

highlights 100 Resilient Cities as a key case study. The City Resilience Index that was used as the intellectual framework for resilience by the 100 cities was one of the key resources that Welsh Water learnt from in developing their approach. Other key references in Resilience in the Round, such as the World Economic Forum's Global Risk Report, were also important building blocks for Welsh Water.

In its 2017 resilience assessment, Welsh Water recognised the potential of the resilience dividend, similarly, the potential for the 'Triple Dividend of Resilience' is highlighted in Resilience in the Round. This sets out how good resilience planning can provide three benefits:

- Avoiding losses
- Stimulating economic activity
- Development of co-benefits.

In line with the requirements set out in the PR19 methodology, Welsh Water had carried out a resilience assessment back in 2017.

Resilience in the Round highlights the importance of planning for the long-term, and accepting uncertainty in the future, which is fundamental to Welsh Water's approach.

Welsh Water Resilience Wheel	Ofwat components
Finance and Governance	Financial / Corporate
People	Corporate / Operational
Infrastructure and Environment	Corporate / Operational

Table 2: Alignment of Welsh Water and Ofwat priorities

#### Areas that align with financial, corporate and operational resilience

The three parts broadly align with the resilience components set out by Ofwat in terms of corporate, operational and financial resilience with customers at the core (Ofwat, 2017a).

In general, there is a strong alignment between the Welsh Water Resilience Wheel and Ofwat's PR19 methodology and across resilience: financial, corporate and operational.

Many of the elements of the Welsh Water Resilience Wheel are representative of wider thinking and concepts outlined in Ofwat's resilience principles, Resilience in the Round and Arup's resilience approach. These findings are presented below:

- **Customers embedded across assessment** - Ofwat has placed customers at the centre of resilience, as one of the core principles of resilience (Ofwat, 2017a,b). Welsh Water has embedded customers in numerous sections of the Resilience Wheel,
- **Vulnerable customers** - Both vulnerable and hard to reach customers are highlighted as important in the wider PR19 methodology. The Welsh Water Resilience Wheel highlights vulnerable customers within the 'inclusive collection methods' sub-theme.
- **Sustainable energy and resources** – Welsh Water has included sustainable approaches to energy and resource use as a stand alone indicator. This has not been overtly included in either Ofwat's or Arup's frameworks. However, Ofwat's impact assessment has a focus 'securing cost efficiency'. As such, the inclusion of sustainable approaches to energy and resource use not only contribute to increased cost efficiencies, but also significantly benefit the wider natural environment and public health.
- **Asset management strategy** – Welsh Water understands that robust asset planning, including a smart and integrated asset information system, provides an important starting point for robust resilience planning.

primarily in the 'meeting customer expectations' theme. This enables the business to understand potential weaknesses in their current approach around customers. This approach also supports Ofwat's impact assessment through focusing on customer impacts rather than just outputs.

## 2. Welsh Water's resilience journey

### Comparison of approaches

- **Affordability and value for money** - Ofwat has stated that 'water and wastewater services must be affordable to customers' (Ofwat, 2017b). Delivering best value solutions for customers is an Ofwat resilience principle and promoting economy and efficiency and ensuring affordability of bills are also two of Ofwat's impact assessment requirements (Ofwat, 2017b). Welsh Water has therefore addressed these important regulatory considerations comprehensively in their approach in its 'ensure value throughout the business' sub-theme.
- **Environment considerations** - Ofwat regards the natural environment as representing the core of water and wastewater provision. As part of their impact assessment, Ofwat also requires water companies to think about the 'environmental challenges'. The Welsh Water approach, through the 'Infrastructure and Environment' dimension, places considerable emphasis on the environment, which whilst it is drawn out of a resilience planning principle, does not fit neatly into operational, corporate or financial resilience as described by Ofwat. Environment is also considered in the Resilience Wheel sub-themes, for example 'Delivering sustainable energy and resources' and 'Protecting public health'.

#### Opportunity areas for further alignment

A number of areas have been identified that represent an opportunity for Welsh Water to develop the existing Resilience Wheel to ensure greater alignment with Ofwat guidance and the framework developed by Arup. These are presented below:

- **Assurance and governance** – The Arup approach has considered 'Good governance and assurance processes', whereas the Resilience Wheel does not explicitly highlight this. One of Ofwat's test areas (Ofwat, 2017b) is to 'secure confidence and assurance' and so an assessment of assurance and governance processes should be included in a robust resilience assessment. This would capture, for example, the company and board structure, alongside enterprise risk management process.
- **Water and wastewater management planning** – The Welsh Water Resilience Wheel does not separate out shorter and longer-term planning. Longer-term planning is at different levels of maturity in water and wastewater across the industry. The Water Resources Management Plan (WRMP) is a statutory requirement, and Ofwat is explicit in expecting water companies to integrate the findings of their WRMP into their consideration of resilience in their business plans (Ofwat, 2017b, Appendix 4). Welsh Water is also leading the development of the process for Waste Water Management Plans as part of the 21<sup>st</sup> Century Drainage Programme, which it will produce once this process is finalised. Inclusion in the Resilience Wheel will help ensure that long-term stresses are addressed around water resources and wastewater, ultimately ensuring a more resilient water company and ensuring continued supply to customers.
- **Horizon scanning** – Horizon scanning, particularly around emerging risks and best practice was integrated into the scoring mechanism in the Welsh Water Resilience Wheel. To more clearly reflect the Ofwat guidance, and to enable better comparison with industry benchmarks, it may be useful to draw this out as an indicator in its own right.
- **Long-term financial planning** – The Resilience Wheel does not reflect 'long-term' thinking around financial planning in the language used. Given the Ofwat guidance on long-term financial viability, Welsh Water could seek to change the language used to ensure that a long-term approach is taken to business financing.

#### Scoring approach

Initially, the Welsh Water Resilience Wheel used a scale of 1-4 for each specific sub-theme. Where 1 was deemed as meeting legislation and 4 was future horizon scanning.

However, since its first application, this has since been updated to a five level assessment. This was introduced to provide Welsh Water with a means to establish a baseline against other water companies who are assessing their resilience using similar approaches.

#### Summary

In summary, the Welsh Water Resilience Wheel is comprehensive in its approach, and addresses the resilience challenges and principles set by Ofwat in its 'Delivering Water 2020' methodology (Ofwat, 2017b).

There are a number of areas where the Resilience Wheel approach provides greater depth than others. Particularly around affordability, environment and sustainable energy use.

Several opportunity areas have been identified where the Resilience Wheel could be improved to ensure a more comprehensive assessment. This primarily consists of updates to the language of the indicators within the wheel to more clearly show alignment to the Ofwat themes.

The Welsh Water Resilience Wheel has been updated on the basis of this review to represent a best practice assessment approach for PR19. Section 5 sets out the new wheel and assessment approach.



### 3. Welsh Water's Resilience Wheel and assessment approach

#### Revised Resilience Wheel

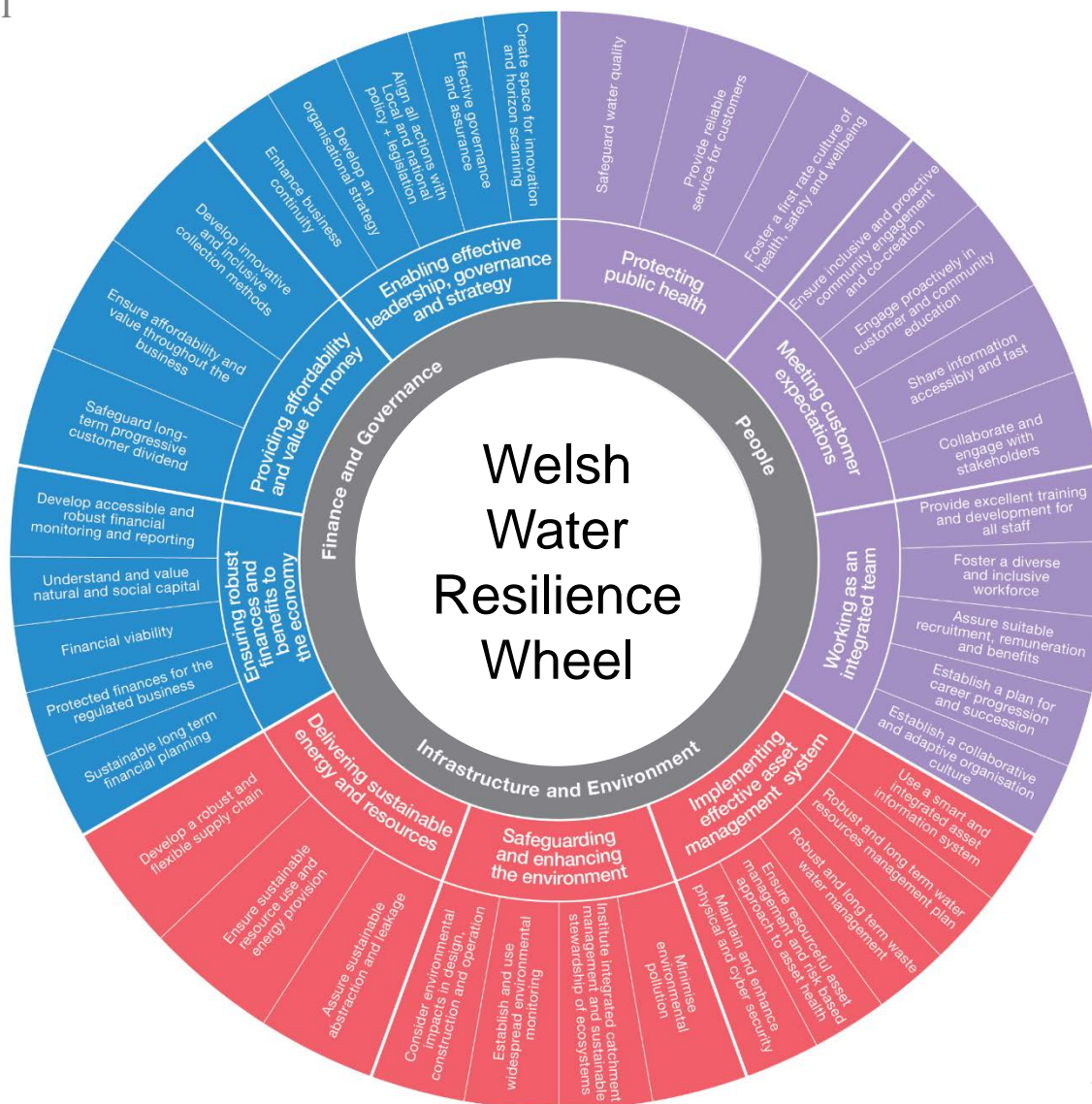


Figure 4: the updated Welsh Water Resilience Wheel  
(© Welsh Water)

### 3. Welsh Water's Resilience Wheel and assessment approach

#### Scoring and resilience assessment approach

The following pages detail Arup's assessment of the resilience of Welsh Water's current and planned activities for AMP7 relating to each theme, subtheme and indicator.

Our assessment is based on interviews with key personnel across Welsh Water's business and policies and reports they provided. A full list of people we have interviewed can be found in appendix B, and our bibliography in appendix C. Our evidence sources are also referenced on each assessment page.

Since Arup's initial work with Welsh Water in 2017, we have carried out similar assessments with six other water companies in England and Wales. We have anonymised the data collected from these assessments to develop an industry benchmark score.

The assessment includes a rating of 1 to 5 against each sub-theme, for both current performance and future potential. The rating is described in Table 3.

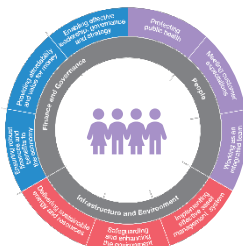
The full detail of the resilience assessment framework can be found in appendix D.



			Level 5 Leading	The company has an industry leading approach to this indicator with cutting edge actions and responses currently in progress. There is significant horizon scanning for future changes and clear methods to including these within plans and strategies. Regular reviews and updates are part of business as usual.
			Level 4 Response in progress	This indicator is a company goal and a response and actions to meet this goal have been applied in practice across most of the company. The company is focused on proactive actions to prevent issues before they arise.
			Level 3 Response developed	This indicator has been clearly identified as a goal and a response has been developed around most elements. This response has yet to be widely actioned, though some pilots may have been undertaken.
			Level 2 Aware a response should be developed	This indicators has been identified as a potential goal for the future but has yet to be formally adopted into process, plans, strategies and operational activities. In general the company reacts only to issues that arise as they arise.
			Level 1 Unaware of indicator	This indicator has not been determined as a goal. There are significant gaps in understanding, processes, plans, strategies and operational activities to achieve this goal.

Table 3: Resilience wheel maturity assessment scoring approach  
In the future scoring wheel, the current score is shown in grey and only the improvements in AMP7 and beyond are shown in colour.

Figure 5: Resilience wheel maturity assessment approach



## 4. Resilience assessment for Welsh Water: People

Level 5- Leading
Level 4- Response in progress
Level 3- Response developed
Level 2- Aware a response should be developed
Level 1- Unaware of indicator

**Interviews:** Aled Daniel<sup>1</sup>, Anna Riddick<sup>2</sup>, Dale Walker<sup>7</sup>, Dave Collins<sup>9</sup>, Dave Taylor<sup>10</sup>, Linda Williams<sup>11</sup>, Martin Hennessey<sup>12</sup>, Nikki Kemmery<sup>16</sup>, Peter Davis<sup>18</sup>, Samantha James<sup>19</sup>, Sian Robinson<sup>21</sup>, Tony Harrington<sup>22</sup>, Wayne Arscott<sup>23</sup>, Alun Shurmer<sup>24</sup>, Chris Jones<sup>26</sup>, Chris Jones<sup>28</sup>, Ian Christie<sup>29</sup>, Steve Wilson<sup>30</sup>, Nick Parkin<sup>31</sup>, Amanda Soady<sup>32</sup>, Peter Perry<sup>36</sup>

### Key findings

#### Areas of strength

- System-wide improvements are in progress to improve poor water quality acceptability and ensure that water quality can be maintained in the future.
- Expanding network monitoring following Storm Emma to improve prior warning, response and recovery and to target actions.
- Communication during Storm Emma was recognised as good practice by Ofwat, showing inclusivity and flexibility.
- Good standard of health and safety management in place for current risks and there is good work in progress in the wellbeing arena, showing robust well managed systems.
- Wide reaching community engagement, interaction with young people and close relationship with Customer Challenge Group. Examples include projects such as Rhondda Fach water resilient communities and Project Cartref, both showing inclusiveness and integration.
- Wide-ranging campaigns to support customer education, such as “Wrap up Wales”, “Let’s Stop the Block” and “One Last Breath”. These schemes are reflective and inclusive, giving ownership for decision making to the community.
- Development of tools to better understand data from customer feedback, and potentially opening up data, leading to alternative resource use and integration of distinct systems.
- Positive, collaborative programmes to encourage diversity. For example, Network75 is inclusive and supports the recruitment of people from less traditional backgrounds.
- The Welsh Water apprenticeship and graduate programmes are well regarded, developing key capability in-house. For example, Welsh Water is the first company to sponsor an innovative new university in Hereford, linked to capital investment and delivering skills for the future. This is to create a robust skills base, with potential for redundancy.

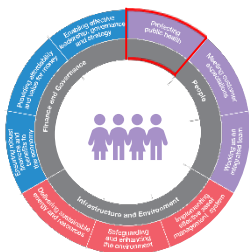
#### Areas to enhance

- Potential to expand real-time monitoring of the network and link to network management to improve integration and flexibility.
- Opportunity to improve internal data sharing and communication, including integration of systems.
- Community education and outreach programmes are often project specific or linked to education centres. There is an opportunity to increase inclusivity, following the Water Resilient Communities model, to reach a broader audience.
- Opportunity to map strategic stakeholders and strengthen partnerships with third parties following on from Welsh Water 2050, which sets out who Welsh Water might partner with to advance their strategic responses.
- Opportunity to be more explicit in horizon scanning linked to long-term workforce skills gap planning, creating redundancy.
- Opportunity to develop stronger communication and more collaborative culture across the business and supply chain.
- Opportunity to connect the PR19 Business Plan, training and development, and strategic workforce planning.
- Opportunity to connect and leverage examples of good practice on recruitment across the business.
- Delivery of greater flexibility and integration from long-term thinking across the business could be achieved through the development of a cultural change programme aligned to Welsh Water 2050 and PR19.





## 4. Resilience assessment for Welsh Water: People Protecting public health



### Safeguard water quality

#### What leading looks like (Level 5):

Water quality at taps meets all legislative quality requirements and has excellent taste and clarity. Water treatment works are adaptive to changing contaminants in the water and upstream interventions should be utilised to improve and maintain high quality water.

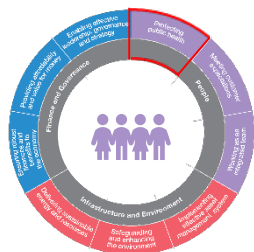
**Documents reviewed:** Welsh Water 2018b, Welsh Water 2018c,

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>99.96% of the water that Welsh Water supplies meets drinking water quality standards at customer taps. This is in line with average drinking water quality compliance standards in the UK. However, Welsh Water's performance on providing acceptable water quality for customers is consistently worse than the industry average across England and Wales. The majority of customer contacts on this relate to discoloration, taste and odour, which is due in part to unlined iron mains and the quality characteristics of the raw water.</p> <p>In response to this challenge, Welsh Water has created a long term acceptability of water strategy in 2015 to drive improvements in operational practices and to investigate the root causes of acceptability of water complaints through zonal studies, which helps to support targeted investment. Welsh Water has been working with DWI to improve their performance in AMP6. This led to DWI issuing improvement notices for 32 of their 82 water quality zones (Welsh Water 2018b). Further detail on some of the activity that has already begun to support the delivery of this strategy is outlined below.</p> <p>Welsh Water is beginning to identify, test and implement progressive catchment measures to improve the resilience of water quality and their water supply systems, known as the 'WaterSource' approach. Through their Weed Wiper Trial and PestSmart programme they have already reduced the levels of herbicides and pesticides entering the environment in some areas. They have also trialed some reservoir initiatives, and partnered to help restore two areas of peatland and one area of fenland to help control raw water quality in their reservoirs. They have carried out extensive stakeholder activities in order to develop their BBMC strategy, which is intended to be a blueprint for their other at-risk catchments in the future.</p> <p>Welsh Water founded the UK Water Industry Taste and Odour Working Group in 2017, and is working with other water companies to investigate techniques for mitigating poor taste and odour in the face of deteriorating water quality.</p> <p>In AMP6, Welsh Water took a whole system approach to analysing the acceptability of water across all 82 water distribution zones, and is carrying out a targeted programme of pipe cleansing and replacement based on the findings from these "zonal studies".</p> <p>It has also implemented reservoir mixing at two reservoirs in order to improve oxidation to remove</p>	<p>Welsh Water is planning to invest in improving the acceptability of the water supplied to customers. This will involve continuing with the programme of zonal studies and focused capital improvements to improve services for customers and reduce discoloration. This includes plans for operational improvements such as improved modelling, training for internal and third party operators and other upgrades like tickle caps, line filters and low-velocity flushing (Welsh Water 2018b).</p> <p>Welsh Water is planning to continue with pipe cleansing and replacement as part of the zonal studies programme. It will also install manganese removal schemes at five WTW, building on work completed in AMP6.</p> <p>Welsh Water will roll out Water Care Plans and self cleansing networks across its area if these initiatives prove viable.</p> <p>The organisation is also planning to expand and enhance their WaterSource approach to catchment management, and roll out their Weed Wiper Partnership approach to additional catchments where this would bring value and reduce pesticide and herbicide loadings.</p>	Level 3	Level 4	Level 2.6	Level 3.5

## 4. Resilience assessment for Welsh Water: People Protecting public health



### Safeguard water quality, continued

**Documents reviewed:** Welsh Water 2018b, Welsh Water 2018c,

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Preliminary  
Industry benchmark

#### Welsh Water's performance now

manganese, tackling one of the root causes of discoloured water. The organisation has also trialled modifications for manganese removal at one water treatment works (WTW).

Welsh Water is trialling 'Water Care Plans' proactively to help manage the ongoing cleaning, flushing and maintenance. It is also investigating self-cleansing networks – maintaining a sufficient velocity in networks to prevent deposition.

It also plans to complete the installation of 'run to waste' facilities at all their WTW by the end of AMP6 in order avoid water quality failures that can't otherwise be mitigated. The organisation is also performing Bacti Action Audits to drive their programme of tank inspection and tank cleaning to avoid bacteriological failures.

**Welsh Water has scored a level 3 because acceptability of water is low among customers, improvements are planned but work is required to catch up with the industry standard. Its focus of managing water in their catchments is a positive, progressive step.**

#### Welsh Water's plans for AMP7 and beyond

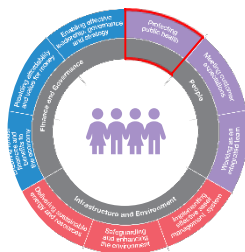
The organisation will implement its BBMC Strategy, which will include peatland restoration, the creation of buffer zones and tree planting. It is also planning to expand this approach to all their at-risk catchments where necessary, including North Wales. It will continue to trial catchment interventions, such as reservoir mixing and ultrasound, to improve the quality of raw water.

**Welsh Water would score a level 4 in AMP7 and beyond, with the implementation of the plans described above.**

Now	AMP7 & beyond	Now	AMP7 & beyond
Level 3	Level 4	Level 2.6	Level 3.5

**Areas to enhance:** Welsh Water's focus now needs to be on delivery of these programmes to achieve the desired outcomes, with constant review and learning to feedback the outcomes.

## 4. Resilience assessment for Welsh Water: People Protecting public health



### Provide reliable service for customers

#### What leading looks like (Level 5):

Company operations focus on providing a continuity of service to customers and avoiding critical service failures, such as supply interruptions and internal sewer flooding. Water supply interruptions only occur in the most unlikely situations with redundancy plans being built into all critical aspects of the supply network and contingency plans in case of extreme disruptions. There are long-term strategies to ensure that the system has sufficient capacity to cope with future conditions. Mechanisms should be in place to regularly review and update all plans and data. It also takes into account the different needs of customers, particularly those who are vulnerable.

Documents reviewed: Welsh Water 2018a, Welsh Water n.a.d,

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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#### Preliminary Industry benchmark

#### Welsh Water's performance now

Welsh Water's approach to providing a reliable service to customers is based on a combination of reliable infrastructure that is protected, assets with redundancy built in and appropriate procedures to deliver an appropriate response to maintain service levels to customers in the event of an incident. Approaches have been developed for each of these, but these have not yet fully been rolled out.

For example, there is a Customer Minutes Lost strategy and a drive to reduce interruptions to supply, as measured in 'Customer Minutes Lost' (CML). Half of the reduction in CML has been due to tankering and overland main by the emergency planning team<sup>1</sup>. Wales also has some inherent issues with removing single sources of supply due to its rural nature; grid systems and redundancy are not suitable across the network<sup>10</sup>.

Welsh Water experiences uniquely high pressure in its distribution network, making it susceptible to bursts. It has already installed 2,300 pressure loggers across 80% of its network, including in rural areas, to enable it to accurately calculate supply interruptions and more quickly mobilise to address burst mains. The organisation has also installed alarms to alert it of sudden pressure drops, and by the end of AMP6 is planning to link pressure loggers with predictive systems in order to more efficiently respond to burst main events.

Welsh Water has also completed a resilience review of the Felindre Trunk Main, a major link between South East and South West Wales. It has identified 34 risk points along its length, which has provided the baseline for phased improvements in the coming years.

Welsh Water has formed its Water Network Alliance, which combines the leakage reduction, burst main repairs, and lead replacement programmes. This is to provide economies of scale, reduce programme risk and allow better co-ordination.

#### Welsh Water's plans for AMP7 and beyond

Investment to reduce the CML is planned, with aims to improve the reliability of water resource provision. Welsh Water is beginning to improve the reliability of its supply systems in Merthyr, by building additional potable water storage and ultimately replacing five older WTW with a single new 'superworks'. It is also planning on increasing or refurbishing storage at several strategic locations at Broomy Hill and Maerdy Porth. In the long term, the organisation plans to rationalise the number of their WTW to 40.

There are plans to increase the resilience of supply to South East Wales, a key economic centre, by strengthening the Felindre Trunk Main. Furthermore, Welsh Water is aiming to build at least 24 hours of treated water capacity at every WTW. Welsh Water's WaterSource approach and the BBMC Project will improve the reliability of raw water entering the WTW in terms of quality and quantity (Welsh Water, 2018c). In addition, Welsh Water is aiming to provide resilience to all key assets supplying 3,000 people.

The PR19 plan includes actions related to emergency response, which will enable Welsh Water to provide a reliable service for customers:

- Providing standby power generators to improve the resilience at operational depots
- Mobile phone coverage in silver rooms at all operational depots
- Updating the emergency bowser plans (where they are deployed in different areas if the water supply was unavailable)

#### Now

#### AMP7 & beyond

#### Now

#### AMP7 & beyond

Level 3

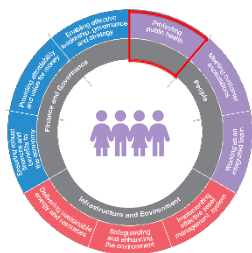
Level 3

Level 2.9

Level 3.5



## 4. Resilience assessment for Welsh Water: People Protecting public health



Provide reliable service for customers,  
continued

Documents reviewed: Welsh Water 2018a, Welsh Water n.a.d,

Level 1: Unaware  
of indicator

Level 2: Aware a  
response should  
be developed

Level 3:  
Response  
developed

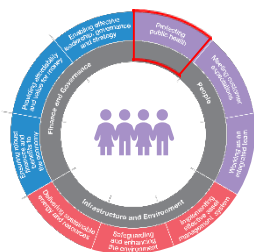
Level  
4: Response in  
progress

Level 5:  
Leading

		Preliminary Industry benchmark			
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>The organisation has also introduced a 'pain gain' contract model to incentivise better contractor performance, and is issuing one leakage delivery contract for the whole of their operating area.</p> <p>If an incident occurs, there are dedicated emergency response teams tasked with returning the service to normal. There is a sub-team within the emergency response team with a focus on maintaining the best possible service.</p> <p>Welsh Water is trialling proactive leakage technologies to find and fix before they impact on services to their customers and using the industry-leading Risk Assessment for Reservoir Safety process to ensure an acceptable level of risk and reliable water supply service.</p> <p>Welsh Water has also developed a programme called 'Wrap up Wales'. This was rolled out in advance of Storm Emma in March 2018, to educate people to turn off and drain water when buildings are left empty.</p> <p>Welsh Water has a priority services register. Welsh Water is aware that it does not list all the customers who are eligible for support. As part of Welsh Water's customer-led Success Approach (Welsh Water, 2018a), Welsh Water is collaborating with over 150 stakeholders to improve their identification of vulnerable customers<sup>19</sup>.</p> <p><b>Welsh Water scores a level 3 because they are currently planning how to provide a more reliable service.</b></p>	<ul style="list-style-type: none"> <li>• Total loss contingency manuals update</li> <li>• Mobile command centre replacement</li> <li>• Updating emergency response plans.</li> </ul> <p>Welsh Water is planning to combine customer data, pressure data and geospatial data in order to better respond to incidents that could affect the reliability of services to customers. Welsh Water has recognised that the condition of many of its tunnels is unknown, and therefore it will focus on a programme of tunnel surveys in AMP7.</p> <p>There are plans to improve how vulnerable customers are identified, in a vulnerable customers strategy, working in a more co-ordinated way with stakeholders<sup>19</sup>, such as working with other utilities to identify people who need additional support and including them on the priority service register (Welsh Water 2018a). There are plans to improve customer service for low income groups. This will ensure that groups who are less digitally engaged will still be provided with an acceptable level of service (Welsh Water, n.a.d).</p> <p><b>Welsh Water's score remains at level 4 because they have plans in place for greater interconnectivity, and removal of surface water from the system, which we expect to be delivered in the future.</b></p>	Level 3	Level 3	Level 2.9	Level 3.5

**Areas to enhance:** Welsh Water has begun to consider opportunities to create greater connectivity in its network. Temporary approaches are currently being put in place, with an intention to make some of these permanent in AMP7. In order to deal with future uncertainty and greater likelihood of extreme events, there is an opportunity to speed this programme up to achieve greater redundancy in a grid network system. The Resilience Scorecards provide a useful summary and focus to support progress with this theme. There is an opportunity to further align these with risks highlighted in the corporate risk register and to integrate a wider range of shocks and stresses into the assessment. Welsh Water should consider opportunities to develop up to date continuity plans across its sites and to review, update and maintain these as needed. Welsh Water has recently expanded its incident response teams with more analytical and management-level support. This should be kept under review to allow the wider leadership teams to maintain a focus on wider strategic and operational issues, alongside incident and event management.

## 4. Resilience assessment for Welsh Water: People Protecting public health



### Foster a first rate culture of health and safety and well-being

#### What leading looks like (Level 5):

The company has reliable and robust plans for health, safety and wellbeing which will make significant and measurable improvements to the lives of the workforce. There is a good health, safety and wellbeing culture within the organisation with reporting of near misses and positive interventions as well as regular health and safety stand-down days and a focus on public health, staff health and wellbeing. Leaders and managers should have suitable training on health and safety. There is a range of KPIs linked to their major accident hazards. The KPIs should be used to measure actions and activities carried out to ensure that the critical controls required to prevent serious injuries and incidents of ill health are in place and that these KPIs are monitored frequently (weekly/monthly) to ensure they are maintained.

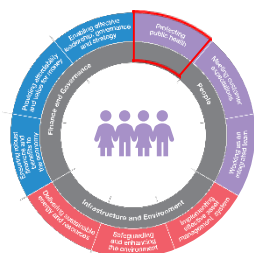
Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water has achieved the Welsh Government 'Platinum' Level award for Occupational Health and Safety in 2018. Welsh Water is recognised by HSE as a leading company for good practice in Wales<sup>36</sup>. There is a five-year health and safety strategy, also covering well-being, which focuses on continual improvement. This includes leadership, management, risk, safety, health, well-being and culture, both in the work as well as the staffs fitness for work- based on their lifestyle. The performance against this strategy is monitored and reported quarterly. There is a good health and safety culture with reporting of near misses and positive interventions. This includes stand down days, positive interventions and reporting across the whole organisation including the supply chain.</p> <p>There is a long running wellness campaign. For the last year, there have been Well-being Champions, with in-depth external training, who help colleagues stay in the workplace. This has been a pilot and has not yet been rolled out business wide, with Champions mainly sitting in retail. There is a voluntary health clinic run by Welsh Water, which helps staff to feel they are looked after by the company.</p> <p>The commitment to health and safety stems from the leadership of Welsh Water. The Main Board has used the HSE good practice guidelines for the last eight years and receives regular health and safety training which cascades down to the Executive team and senior managers<sup>36</sup>. The MD leads the company's Health and Safety Steering Group and the Executive team leads a minimum of four safety days a year<sup>36</sup>. The annual employee engagement survey reflects how seriously staff take health and safety and well-being. 97% of staff think the company takes health and safety seriously, and 80% think well-being is taken seriously. This percentage has increased in the last year (Welsh Water &amp; ORC, 2017).</p> <p>Learning for internal processes is undertaken, with monthly toolbox talks, all team meetings including health and safety moments, and the Health and Safety team goes out quarterly and speaks to the business. The companies 'STEP' behaviour safety programme ensures managers use 'Safety Conversations' and report interventions and near misses and there are 'STEP' Champions through the business<sup>36</sup>. All employees have health and safety objectives and responsibilities set out in the appraisal process<sup>36</sup>. Learning from other sectors is applied to improve processes. Last year, Welsh Water worked with Airbus and Admiral to learn how to deal with sickness in call centers<sup>16</sup>.</p> <p><b>Welsh Water scores a level 4 because they have good processes for assessing health, safety and well-being in place, they are not leading because their KPIs could be leading indicators with targets.</b></p>	<p>In the next AMP, there will be evolutions of current plans providing incremental improvements, such as:</p> <ul style="list-style-type: none"> <li>Continuation and development of the STEP process.</li> <li>Further development of process safety management, recognising good practice in oil and gas industries and applying it to new areas like Advanced Anaerobic Digestion Plants.</li> <li>More investment in leadership of health, safety and well-being, with regular training from board to supervisor level.</li> <li>Use technology to improve the ease of recording positive interventions and streamlining personal risk assessments<sup>36</sup>.</li> </ul> <p>There will also be more of a focus on well-being. For example, there are plans to roll out the Well-being Champions piloted in AMP6<sup>16</sup>.</p> <p><b>There is no evidence to support Welsh Water becoming a leading company in AMP7 &amp; beyond.</b></p>	Level 4	Level 4	Level 4	Level 4

Documents reviewed: Welsh Water & ORC 2017, Welsh Water 2017j

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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## 4. Resilience assessment for Welsh Water: People Protecting public health



Foster a first rate culture of health and safety  
and well-being

**Documents reviewed:** Welsh Water & ORC 2017, Welsh Water 2017j

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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**Areas to enhance:** Ensuring that staff have suitable health and safety knowledge and understanding is vital and Welsh Water has training for senior staff and health and safety objectives built into the appraisal process for all staff. From our discussions, areas where this approach could be enhanced is in the creation of a written health and safety competency standard for manager roles. These competency standards could be written into job descriptions and used as assessments during the appraisal process to identify any training needs and ongoing personal development.

Welsh Water has a good process for assessing health, safety and well-being in place, it would benefit from focusing on leading indicators with attainable targets. True leading indicators are not outcome based, they are activities which are carried out to determine an outcome and should have at least a target and preferably a tolerance. It should also be possible to measure them frequently in order to improve or act on any shortfall. Within Welsh Water's monthly reports, there are currently a mix of true leading indicators and those called leading indicators which are actually lagging indicators.

The true leading indicators that are being measured, which have both targets and quarterly reviews, include:

- Health and Safety Training
- Director and Senior Management H&S Conversations
- DCWW Traca Observations
- Capital Leadership inspections
- Capital Engineering quarterly CTRD Inspections

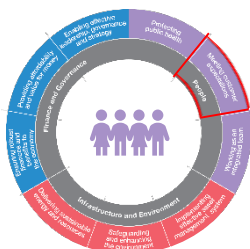
Leading indicators that are actually lagging indicators include:

- Caer Occupational Health Service Use as it is recording an outcome and there is no target.
- Caer Occupational Health – Management Referrals.
- Employee Assistance Programme Service Use
- Risk Management – Top 10 Risk Hazard Interventions. This could be turned into a leading indicator by setting a target for reviewing overdue interventions to determine the reason in order to aid in closing them.

The Key Performance Indicator Dashboard could be improved by ensuring that it provides clearly visible and current information and updating it on a monthly basis or more frequently. The processes in place to measure health and safety could be expanded on to include identifying possible risks to the resilience of HS&W management systems, as well as expanding the monitoring of control measures for resilience and potential risks.



## 4. Resilience assessment for Welsh Water: People Meeting customer expectations



### Ensure inclusive and proactive community engagement and co-creation

#### What leading looks like (Level 5):

The company has a clear two-way dialogue with customers to ensure that customers are included and to improve transparency, cooperation and collaboration on current performance and future direction for the business. There is an extensive programme of inclusive, long-term community engagement at all local scales, which occurs regularly and is monitored. Customer policy and practices are established to meet the needs of customers in vulnerable circumstances. The company aims to establish trust, confidence and legitimacy. Customers and the community also feel that they are part of the planning process and are kept informed. Their feedback is used to continually update strategies.

**Documents reviewed:** Welsh Water 2018a, Welsh Water 2017e, Welsh Water Website

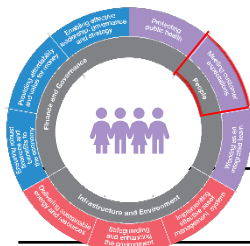
Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water recognises that there is a need for different types of engagement with customers, for different project and programmes needs, ranging from confirmation to co-creation. There has been a significant increase in proactive community engagement since the last price review, and Welsh Water has won numerous awards<sup>24</sup>. They are working to build customer trust through favorability, good customer service, and familiarity.</p> <p>In the award winning 2016 'Have Your Say' campaign, Welsh Water engaged customers on how 'profits' should be returned to customers, and over 12,000 customers responded<sup>24</sup>. In 2017, Welsh Water undertook engagement with customers to shape their long-term strategy, Welsh Water 2050, which involved participation from stakeholders and over 20,000 customers. Wide reaching and innovative approaches were taken, such as the bilingual chatbot to encourage uptake. More difficult to reach and vulnerable customers are included in in-depth customer research separately based on customer segmentation.</p> <p>The Customer Challenge Group (CCG) is heavily involved with development of plans and provide detailed feedback<sup>2,18</sup>. The CCG is actively engaged with reviewing Welsh Water's current and proposed activities and feeding back to the Board<sup>18</sup>. There is a Youth Board (who are between 16 and 18 years old) that has been set up to provide a future customer perspective to feed into AMP7 plans. Welsh Water has recently started multilingual chatbots, app and an online community, to receive feedback from customers across the demographics of the population.</p> <p>Welsh Water has a number of examples of working proactively with different communities that they serve. For example, in Cardiff and Swansea, they have specifically been working with Muslim communities to understand the impacts of Ramadan on water usage.</p>	<p>There is no formal on-going community engagement plan in place yet, but this is to be developed during AMP6. Welsh Water is planning to continue to search for new and improved ways of engaging with customers. They will continue to work closely with the CCG in AMP7 with an engagement programme to be agreed in autumn 2018.</p> <p>There are plans to create a permanent Youth Board in partnership with Wales Council for Voluntary Action (WCVA)<sup>24</sup>. The Online Community will stay in place, grow, and be used for consultation throughout the AMP to enable research to be turned around quickly to keep up with the pace of change.</p> <p>There are plans to keep and develop the online community developed for Welsh Water 2050 and PR19 long term.</p> <p>Welsh Water plans to work with customers to identify how any value generated should be returned to customers in the future.</p>	Level 4	Level 4	Level 3.2	Level 4

## 4. Resilience assessment for Welsh Water: People Meeting customer expectations

### Ensure inclusive and proactive community engagement and co-creation, continued



**Documents reviewed:** Welsh Water 2018a, Welsh Water 2017e, Welsh Water Website

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Preliminary  
Industry benchmark

#### Welsh Water's performance now

Welsh Water uses a customer-led success approach in some programmes to improve its processes. A good example is the Rhondda Fach Water Resilient Communities project that works with the community to create long-term benefits to communities (Welsh Water, 2018a). This pilot project is focused on maximising the benefits to a community of planned capital investment in the area. The area is one of the lowest scoring on Wales' Index of Multiple Deprivation (WMD), and measures have been specifically targeted based on this socio-economic profile. This includes sharing information on bill payment, vulnerable customers, providing small business support and undertaking zonal studies in a community simultaneously (Welsh Water, 2018a). As part of this resilient communities work, Welsh Water is also looking at providing apprenticeships.

Other projects which have undertaken significant engagement include RainScape projects including Greener Grangetown and Stebonheath School in Llanelli, where communities helped to determine appropriate solutions. The WaterSource project has initiatives like PestSmart and Weed Wipers which work with customers and the agricultural community to improve catchment management. Wastewater operational staff have had customer service training if they work in rural areas, as they are more likely to interact with customers.

Welsh Water are looking at new ways to track how their customers feel about them through a customer sentiment dashboard, Tableau. This is a heat map dashboard which uses text analytics methods and other statistical techniques to evaluate sentiment based upon how their customers have interacted with them and to track hotspots. They have also identified over 25,000 customers as vulnerable, and captured these in the priority services register. They have responses in place to deal with a range of vulnerabilities through inclusive and innovative collection methods and suitable responses in the case of extreme events.

**Welsh Water scores a level 4 because it has a variety of wide reaching projects based on community engagement and co-creation. Evidence provided shows that community engagement has been undertaken extensively for PR19 and that there are some good practice pilots in place.**

#### Welsh Water's plans for AMP7 and beyond

The Water Resilient Communities project will be rolled out in other areas, with one new community focused on each year. These will be prioritised based on where Welsh Water is investing in capital schemes and wards that are high on the Wales Index of Multiple Deprivation (WIMD). The objective is to develop focused place-based interventions, bespoke to each community's needs.

There are plans to update Tableau in AMP7 to ensure that it includes social media inputs as well as telephone contacts to give Welsh Water a more complete view of sentiment.

**A formal plan on-going customer engagement plan is still to be developed. If this embraces the principles of the Water Resilient Communities project and embeds them across all the engagement that is undertaken, Welsh Water could become leading in the future.**

#### Now

#### AMP7 & beyond

#### Now

#### AMP7 & beyond

Level 4

Level 4

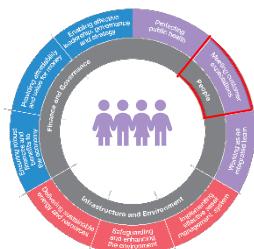
Level 3.2

Level 4

**Areas to enhance:** Lessons learnt from this good engagement for PR19 should be understood and incorporated into business as usual. To meet their vision, the work to integrate customer and operational data through a customer sentiment dashboard is vital and should be reviewed to ensure it is delivering the value it is predicted to. There is an opportunity to expand on the customer led success throughout the business, expanding operational staff customer service training more widely in the business.

Ethnographic research, behaviour change research and behaviour economics research are areas that could be strengthened to enable more effective engagement.

## 4. Resilience assessment for Welsh Water: People Meeting customer expectations



### Engage proactively in customer and community education

#### What leading looks like (Level 5):

The company undertakes activities which have wider benefits to the communities that they serve. Customer and community education is comprehensive and proactively undertaken. It is based on best available understanding of behaviour change, psychology and customer insight. Information is available in suitable formats and is distributed effectively to all customers.

**Documents reviewed:** Welsh Water Website, Welsh Water 2018h, Welsh Water 2018i, Welsh Water 2018j,

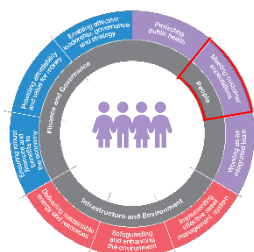
Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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#### Preliminary Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water's aim is to build trust in communities. To do this they recognise that they must be more visible in communities, and one method is to undertake community education, both large scale and community scale in partnership with trust local leaders. On top of this, in 2016 they undertook the 'Have your say' consultation, where customers stated that community benefits was one of the key ways to spend the 'return of value' money from their not-for-profit status.</p> <p>Welsh Water has an education plan, which has reached 67,000 children and young people in 2017/18. This educational activity is focused on primary school children, but has expanded out to older children, including the development of a number of challenges for the Welsh Baccalaureate. These lessons are conducted in 'Discovery Centres' or in schools as part of a wider outreach programme. These lessons and workshops are focused on key business objectives like water efficiency, RainScape and STEM promotion and aim to also influence parents<sup>24</sup>.</p> <p>There are education centres, which have been visited by 164,000 children to date: Cog Moors and Cilfynydd in South Wales, Llyn Brenig in North Wales and the Elan Valley in mid Wales (Welsh Water, 2018h) . These centres are run by environmental rangers and seconded teachers, providing children with free access to practical activities to learn about water, tours and nature trails (Welsh Water 2018i). The River Schools Education Programme, in conjunction with Groundwork North Wales and NRW will work with schools in catchments which are not Water Framework Directive (WFD) 'good' status to raise awareness of the environment (Welsh Water 2018j).</p> <p>Welsh Water has a number of ongoing award winning customer behaviour change campaigns. These include: 'One Last Breath' a campaign on reservoir safety that went viral, 'Let's Stop the Block' campaign, to reduce sewer use, which used behaviour economics, 'Wrap Up Wales' to improve winter preparedness, and 'Tap' to encourage drinking tap water, reducing single use plastic and promote refilling<sup>24</sup>. Welsh Water is using social media to educate customers with content such as videos, games and microsites to target certain activities like 'Wrap up Wales' survey to tell you if your house is ready for winter. Another example of targeting a specific audience is 'Loo Loo's Night Club' targeting young people to 'Let's Stop the Block'<sup>24</sup>.</p>	<p>Welsh Water plans to increase the education plan to reach 75,000 children per year.</p> <p>A new education centre is planned to be built in the Centre of Cardiff linked to Lisvane and Llanishen reservoirs. There is also significant investment in the Pembrokeshire outdoor visitor centre. There are future aims to combine reservoirs and education centres with local community cafes and schools strengthening their 'friends of' partnerships<sup>21</sup>.</p> <p>Welsh Water plans to incorporate behavioural economic principles into campaigns building on work with Corporate Culture and Ofwat's 'Tapped In' report. This will be used in programmes like 'Tap', 'Wrap up Wales', 'Let's Stop the Block', 'Reservoir Safety' and Water Resilient Communities.</p>				
		Level 4	Level 4	Level 3.3	Level 4



## 4. Resilience assessment for Welsh Water: People Meeting customer expectations



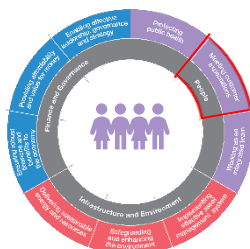
### Engage proactively in customer and community education, continued

**Documents reviewed:** Welsh Water Website, Welsh Water 2018h, Welsh Water 2018i, Welsh Water 2018j,

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Preliminary Industry benchmark			
		Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water has opened up sewage works in the 'Your Community Works' programme to allow open access two days a year and to enable wider access community groups on appointment. New works are added each year<sup>24</sup>. They also attend summer shows and local events like Eisteddfod, Royal Welsh, Pride and Tenby Ironman. Welsh Water undertakes community education on social tariff take-up, and promotion of their graduate and apprenticeship programme. Their capital investment schemes also have education programmes which cover public drop-in sessions to online information. There are also Community Vans which help answer customers' questions, problems in the area and how to get financial assessments. Projects such as Rhondda Fach and RainScape also provide customer education<sup>24</sup>. In Rhondda Fach, they have aligned with Local Authority and Local Health Board programmes like the 'Milk Teeth' plan and helped young people to finish the 'Get into Construction' taster with the Princes Trust.</p> <p>Water efficiency is an important topic for community education. This is support by property audits; the Water Efficiency team audits and provides education and support to both household and non household customers.</p> <p><b>Welsh Water scores a level 4 because Welsh Water has wide reaching, comprehensive education programmes that reach diverse groups within the community.</b></p>	<p><b>Welsh Water remains at a level 4 because a greater understanding of behaviour change is required to deliver effective long term behaviour changes.</b></p>	Level 4	Level 4	Level 3.3	Level 4
<p><b>Areas to enhance:</b> Welsh Water has ambitious water consumption reduction targets to meet, which will require significant customer behaviour change. There is an opportunity for Welsh Water to do more research on behaviour change and economics to increase the understanding the business has on how best to achieve effective long term behaviour changes. Work on implementing these research findings on customer insight, psychology and behaviour change is also vital.</p>					

## 4. Resilience assessment for Welsh Water: People Meeting customer expectations



### Share information accessibly and fast

#### What leading looks like (Level 5):

Information is presented in multiple ways so that it is understandable by all and is shared in a co-ordinated process via suitable pathways internally, with stakeholders and with customers, as appropriate. This information should include, at a minimum, any service issues, service updates, finance and how customers money is invested. All appropriate real time data and information is shared accurately and quickly with regulators and partners. Where suitable, information and data is also available in real-time, with the data sets being easily downloadable.

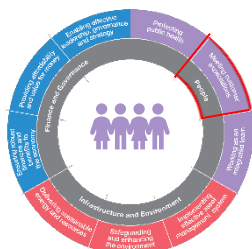
**Documents reviewed:** Welsh Water 2017b, Welsh Water, 2018l, Welsh Water 2017i

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>During Storm Emma, Welsh Water recognised that there were some difficulties in sharing up to date information internally on the situation. This prevented the customer service team being able to provide up to date information to customers. There are plans in place to improve this communication gap. There is an in-house data science team which is working to ensure that all data is aligned on one system.</p> <p>Information is manually shared reactively on request with regulators or partners. Data sets such as environmental monitoring data are shared with NRW<sup>26</sup>. Information on disruptions is manually released and provides little helpful information, e.g. repair time. Welsh Water currently shares information with third parties, from regulatory information to priority service information sharing. They are looking to do this within the provisions of the data service act. As part of the standard process, systems incorporate publicly available information<sup>19</sup>.</p> <p>Welsh Water's bills show the split of finances and how money is reinvested. There are also bilingual bills and call centres to aid information dissemination. Customers can opt in to Welsh language information (Welsh Water 2017b). Welsh Water has invested £0.5m in 2017 to bring response time to emails down from 5 days to 12 hours<sup>23</sup>. There has been training and coaching of front line employees, further system development and a new team has been introduced that focuses on proactively identifying service failures<sup>23</sup>. There are upgrades in progress of the telephone and web systems to expand digital services and integration of contact channels and core systems<sup>23</sup>. Billing systems and the website have been integrated for routine transactions (e.g. meter readings and payments). Customer communication has been made easier through the 'Agent desktop' which collects all customer information together<sup>23</sup>.</p>	<p>There are plans to share customer data better internally in a customer sentiment dashboard which is under development<sup>24</sup>. There is an IT strategy looking to 2025, which includes improved internal interoperable data using WISER Data Strategy and smart data to improve data architecture, management and quality. There are plans to create a 'data lake' to make it easier to share data between Information Technology (IT) and Operational Technology (OT) estates. There is progress within the company to use 'Source', a SharePoint to enable improved collaboration. Pilots of new internal platforms like the environmental data sharing platform are being discussed (Welsh Water 2017i).</p> <p>In AMP7, there is a plan to undertake a pilot of open data sharing with third parties (Welsh Water, 2018l). Welsh Water will partner with NRW to share CSO spill data with the public<sup>30</sup>. The phase 3 cyber pilot planned for AMP7 is focused on secure transfer of data between third parties<sup>7</sup>.</p> <p>Welsh Water has pledged to play a leading role in establishing an all-Wales forum on how utilities and local authorities can shared data on priority services<sup>19</sup>. Welsh Water will work with over 180 partners to improve and expand on the service for customers in vulnerable circumstances<sup>19</sup>.</p>	Level 3	Level 4	N.A.	N.A.

## 4. Resilience assessment for Welsh Water: People Meeting customer expectations



Share information accessibly and fast,  
Continued

**Documents reviewed:** Welsh Water 2017b, Welsh Water, 2018l, Welsh Water 2017i

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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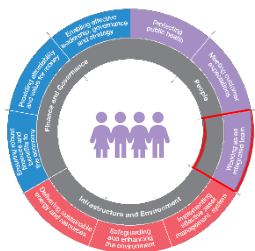
		Preliminary Industry benchmark			
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p><b>Welsh Water scores a level 3 because currently their systems are not efficient at sharing data internally, but they are working on this, and developing a response to the changes required by technological advances.</b></p>	<p>There are plans to keep pace with the rate of technological enhancements so that customers are able to easily use services like online accounts and self-service through different technologies. A retail strategy to accomplish this is in the process of being created<sup>19</sup>. There are plans to develop web and mobile capabilities for customers to self-serve, linked to real-time data<sup>23</sup>. This will include personalisation, consumption information, advice on efficiency and other services available<sup>23</sup>. There is a plan to redesign bills to be more personalised and share information on water usage, efficiency and moneysaving advice<sup>19</sup>.</p> <p>Welsh Water plans to use the Uno programme to improve the customer experience when they contact Welsh Water by either improving ways to engage or removing the need for contact. It will create an 'omni-channel' experience by combining in a single platform Interactive Voice Response (IVR), voice, email, white-mail, web-chat and SMS improving the service they currently provide (Welsh Water 2017i).</p> <p><b>Welsh Water would move to a level 4 if the plans to share data internally, with customers and with stakeholders were implemented.</b></p>	Level 3	Level 4	N.A.	N.A.

### Areas to enhance:

Welsh Water would benefit from continuing to improve internal data sharing and communication. Welsh Water has an extensive and comprehensive plan of sharing data with customers more effectively in the future, including pilot projects for open data. This could be expanded to include plans to further roll out open data similar to Yorkshire Water through the Data Mill North.



## 4. Resilience assessment for Welsh Water: People Meeting customer expectations



### Collaborate and engage with stakeholders

#### What leading looks like (Level 5):

Communication with regulators, partners and stakeholders is effective and regularly undertaken which includes leadership on the sharing of innovative ideas. Inclusive engagement and collaboration with stakeholders and other utilities is required across the business and there are mechanisms in place to ensure their views are recorded and disseminated.

Collaboration is demonstrated through multi-agency participation with tangible outputs that improve the resilience to customers and the business.

**Documents reviewed:** Welsh Water 2018a,  
Welsh Water 2018d

Level 1: Unaware  
of indicator

Level 2: Aware a  
response should  
be developed

Level 3:  
Response  
developed

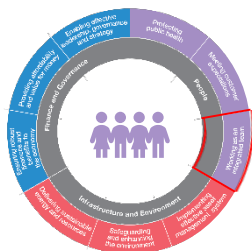
Level 4:  
Response in  
progress

Level 5:  
Leading

Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>The information we have collected suggests that stakeholder engagement is undertaken at various levels, ranging from co-creation to confirmation depending on circumstance<sup>24</sup>.</p> <p>Welsh Water has formalised relationships by developing key groups, such as the Independent Environment Advisory Panel (IEAP) and the Customer Challenge Group (CCG)<sup>24</sup>. It also sits on a number of formal groups chaired by others, such as Water Health Partnership, Wales Water Forum, and Energy &amp; Utilities (EU) Skills Network.</p> <p>In developing Welsh Water 2050, engagement with stakeholders was a central part of the process. This included one-to-one meetings, a stakeholder workshop and a formal written consultation process. The stakeholder feedback, alongside customer input, was reviewed in detail and led to the addition of four new strategic responses on ecosystems and biodiversity, working with customers and the community, affordability and vulnerability (Welsh Water, 2018a). In addition, Welsh Water outlined existing and future partnerships they would like to develop to deliver Welsh Water 2050.</p> <p>Beyond this, collaboration with third parties is often project specific and is limited and focused on information dissemination. Examples of this come through the RainScape programme, where Welsh Water worked closely with NRW, Welsh Government, as well as local councils through working groups, including the £2m Greener Grange town project in Cardiff. This allowed for collaborative working on shared use of infrastructure and reducing the impact to customers. Welsh Water is working with farmers and landowners in their catchment areas to reduce pesticide and herbicide loadings in the environment through their WaterSource programmes, and working with the Rhondda Fach Water Resilient Communities project on sharing information on bill payment, identifying vulnerable customers, providing small business support whilst undertaking zonal studies simultaneously.</p> <p>In the academic world, the organisation is working with academic research partners on aligned research programmes (including UKWIR, Cardiff University Water Institute and Sheffield University). Campaigns that Welsh Water has developed in partnership with others include Wrap Up Wales (working with Age Cymru to mitigate bursts associated with cold weather). In the development of the Social Tariff strategy, Welsh Water is working with 'over 170 groups' to identify those most in need, to get them on the right tariffs and Priority Services Register data sharing (working with WPD and Wales and West Utilities to share data on those eligible for Priority Services).</p>	<p>When Welsh Water 2050 is reviewed every five years, this process will include input from stakeholders to influence decision making (Welsh Water, 2018a). On all the programmes of work in Welsh Water 2050, collaboration with stakeholders is highlighted and key stakeholders are also named in the strategy.</p> <p>Welsh Water plans to expand its Rhondda Fach Water Resilient Communities project across its operating area, prioritising areas appropriately, and working with key community stakeholders.</p>				
		<b>Level 4</b>	<b>Level 4</b>	<b>Level 3.3</b>	<b>Level 3.9</b>

## 4. Resilience assessment for Welsh Water: People Meeting customer expectations



Collaborate and engage with stakeholders,  
continued

**Documents reviewed:** Welsh Water 2018a,  
Welsh Water 2018d

Level 1: Unaware  
of indicator

Level 2: Aware a  
response should  
be developed

Level 3:  
Response  
developed

Level 4:  
Response in  
progress

Level 5:  
Leading

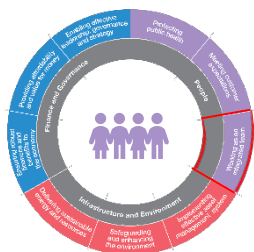
Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water also works closely with Welsh Government and Defra on policy development and on understanding ways in which Welsh Water can contribute to delivery of policy. For example:</p> <ul style="list-style-type: none"> <li>Water Strategy for Wales</li> <li>WG Wellbeing of Future Generations Act (Welsh Water 2050's alignment with this has been highlighted as good practice)</li> <li>Brexit &amp; land use opportunities</li> <li>Catchment agenda (through running their own conferences like WaterSource 18)</li> <li>Multiple consultation responses, Welsh Government Assembly evidence, direct support on policy development in Wales<sup>22</sup>.</li> </ul> <p>Welsh Water also receives over 20 site visits every month from local politicians, they keep them aware of current and future activities, and host frequent policy discussions. Welsh Water founded the UK Water Industry Taste and Odour Working Group in 2017, and is working with other water companies to investigate techniques for mitigating poor taste and odour in the face of deteriorating water quality.</p> <p><b>Welsh Water scores a level 4 because they are collaborating a number of regulators, partners and stakeholders.</b></p>	<p><b>Welsh Water remains a level 4 because their plans could be more joined-up focus on strategic stakeholders.</b></p>	Level 4	Level 4	Level 3.3	Level 3.9

### Areas to enhance:

Welsh Water could enhance this work by developing a more joined-up and business-wide approach to stakeholder mapping and engagement with major stakeholders. Collaboration is a major feature of Welsh Water 2050, in some areas further plans are required to move towards implementation.

## 4. Resilience assessment for Welsh Water: People Working as an integrated team



### Provide excellent training and development for all staff

#### What leading looks like (Level 5):

The training and development programme is comprehensive and all staff should be engaged in continuous improvement. The training programmes are highly customised to an individual's ambitions and are updated and reviewed regularly. They are developed and delivered by a mix of internal and external experts and partners and are based on future need and skills gaps, not just the immediate need.

Preliminary  
Industry benchmark

#### Welsh Water's performance now

Enabled by new performance management process and system, each employee has an opportunity to discuss their specific training and development needs with their manager - monthly during one to ones and at annual appraisal. The newly introduced online performance management system 'Page Up' records training competence and enables staff to see the full suite of training, both internal and external, accessible to them to build their own skills and development plans<sup>16</sup>. There is currently a drive to ensure more continuous tracking of performance and development (opposed to bi-annually) with managers encouraged to log monthly one to one updates into the 'Page Up' system.

There are some specific 'key investment' programmes that support colleagues' basic and compliance skill requirements (e.g. Essentials, Welsh Language, Competent Operator, Safety), career development (Pathways), soft skills (e.g. team development and personal resilience) and professional development. This includes supporting colleagues to study MScs, and engage in joint research projects. Certain key investment programmes are available to targeted or high potential staff around specific key capability areas - for example Customer-Led Success (developing customer service capability); Statistical Training and Analytics in R or 'STAIR' (developing data analytics capability) and the Enhancing Innovation Programme (innovation capability development). Call centre staff watch operational staff train on specialist training rigs, to enable them to better explain to customers the work that is being undertaken. Operational staff, working on rural sewage work, are undertaking customer service training as they are likely to come into contact with customers in their daily work<sup>26</sup>.

Welsh Water is taking the opportunity to upskill the incumbent workforce. Beyond targeted apprenticeship and graduate programmes there is some consideration of future critical skills and development of incumbent staff (for example the Digital Inclusion Programme) and specific interventions to reskill the ageing workforce, in the 'Ageing Workforce Fitness for Work Strategy'.

#### Documents reviewed: Welsh Water 2018a

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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#### Welsh Water's plans for AMP7 and beyond

In Welsh Water 2050, Welsh Water has committed to:

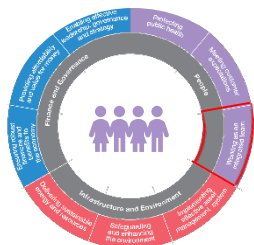
- Embed the responsibility for managers to develop their teams at every level in the business
- Invest in the continuous development of all employees, promoting innovation and securing retention of key knowledge and skills (as directed by strategic workforce planning)
- Expand the apprenticeship programme and provide more internships and placements
- Invest in grad schemes for STEM and data science.

Now AMP7 & beyond Now AMP7 & beyond

Level 3 Level 4 Level 2.9 Level 3.6



## 4. Resilience assessment for Welsh Water: People Working as an integrated team



Provide excellent training and development  
for all staff, continued

Documents reviewed: Welsh Water 2018a

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Preliminary  
Industry benchmark

Welsh Water's performance now

The company is also thinking of ways to broaden development beyond the preferred classroom training to more online methods. This culture shift will take time to embed and is again reliant on technology investment and manager time to be successful. It was noted, however, that training remains fairly technical, business-area specific and individually focused / exclusive. Continuing to network diverse staff and talent cohorts will support greater learning transfer and impact.

**Welsh Water scores a level 3, because whilst there are a number of activities underway to deliver training and development, a strategic workforce plan is currently under development. This will be a living document used to inform plans.**

Welsh Water's plans for AMP7 and beyond

The next AMP will see more technology used in learning. Welsh Water will continue to sponsor colleagues to continue studying and participating in innovation, research and knowledge sharing programmes.

**Welsh Water will have a live strategic workforce plan for the future. This will be linked to AMP7 needs, and through this to the long term vision and has included the redesign of roles as part of this change<sup>11</sup>, so scores a 4.**

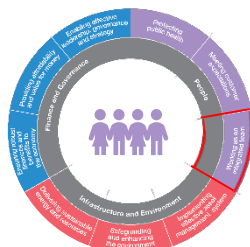
Now AMP7 & beyond Now AMP7 & beyond

Level 3 Level 4 Level 2.9 Level 3.6

**Areas to enhance:** The following present opportunities for Welsh Water to enhance its maturity in this area:

- Connecting WW2050 and long-term needs, the PR19 strategy, strategic workforce planning outcomes and the training and development agenda more directly
- Enabling access to content through the 'Page Up' system could enable more strategically aligned development in the future
- Focus on driving individual and manager accountability for building strategy aligned with capability
- Translating ambitions into live business plans, investment and KPIs

## 4. Resilience assessment for Welsh Water: People Working as an integrated team



### Foster a diverse, inclusive workforce

#### What leading looks like (Level 5):

The culture promoted by the board is consistent across all offices and there are regular events to promote it. The staff feel valued, fairly treated and able to perform at their best. They should also share a strong sense of the inclusive culture and have a strong sense of pride in their work. The company encourages diversity through employee network groups and leadership role models.

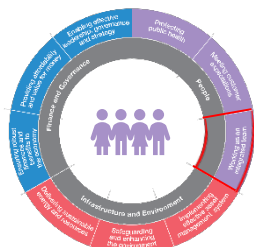
**Documents reviewed:** Welsh Water, 2018k, Welsh Water 2018m, Welsh Water, 2018q, Welsh Water 2018r, Welsh Water, 2018q, Welsh Water 2018s, Welsh Water 2018u, Welsh Water & ORC, 2017

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Given its geography, diversity is a specific challenge for Welsh Water. It, for example, has a Board diversity statement. Welsh Water has developed an Equality, Diversity, and Inclusivity Strategy (Welsh Water, 2018u). It is aware that more can be done to ensure its workforce is more representative of its customer base and has a range of interventions and partnerships to address this.</p> <p>There is a zero tolerance policy on discrimination or harassment which is reinforced through education, e-learning and workshops. Welsh Water has recently piloted 'Equality, Diversity and Unconscious Bias Training' workshops, which will be rolled out to all their staff during 2018/2019) aiming to support more diverse hiring and decision making (Welsh Water, 2018r). Welsh Water promotes gender diversity, Black And Minority Ethnic (BAME) and LGBTQ+ colleagues through its nominated Diversity Champion community (linked to Stonewall), employee networks and programmes like 'Women in Leadership'. Disability and Mental Health awareness and inclusion are also actively promoted with Welsh Water's active participation in the Change 100 programme and their signing of the 'Time to Change Wales' pledge. This aims to remove the stigma associated with mental health issues. They are partnered with Mind Cymru to facilitate Mental Health awareness workshops to equip People Managers (394 trained) with a practical toolkit to assist them in recognising, supporting and managing colleagues who have a mental illness (Welsh Water, 2018s).</p> <p>30% of Welsh Water's workforce is female, which is reflected at executive (27%) and Board (30%) levels. Welsh Water note that this is representative of the current state of the water, mining and energy industry, which is 80% men. In 2018, 44% of new starters were women (Welsh Water, 2018m). To redress the balance Welsh Water is focused on female hiring and promotions; and partnering with Chwarae Teg, who support the development of women in the workplace. Welsh Water is also a member of 'Women in Science and Engineering' (WISE) and have signed up to the 10 Wise Steps to improve women's retention and progression in engineering and science and achieve better gender balance (Welsh Water, 2018s).</p> <p>Recruitment efforts are also targeted to under represented communities, the young and areas of skills shortage (through STEM Cymru). There are connections being made to influence education and awareness in schools and universities to encourage greater interest in careers in the industry and at grassroots levels. Welsh Water is a Prince's Trust Job Ambassador and 'Get into' Programmes, it has facilitated 408 work experience places since 2012 and hosts experience days for women as part of 'Engineering Education</p>	<p>Welsh Water has just developed an Equality, Diversity, and Inclusivity Strategy, 2018 to 2025 (Welsh Water, 2018u), which we expect to be implemented. This includes a continued focus on leader and manager training, targeted recruitment drives, strategic workforce planning and cross-industry partnering has the potential to create a more coordinated and sustainable impact. It also includes a focus on collaboration, environment and education. Success of these efforts will have a positive impact on people resilience in the long term.</p> <p>Other plans include:</p> <ul style="list-style-type: none"> <li>Continue with initiatives such as ongoing support for growth of diversity by partnering with organisations such as Chwarae Teg, Stonewall.</li> <li>Develop further 'inclusive' behavioural training programme – by extending</li> </ul>	Level 3	Level 4	Level 2.9	Level 3.6

## 4. Resilience assessment for Welsh Water: People Working as an integrated team



Foster a diverse, inclusive workforce,  
Continued

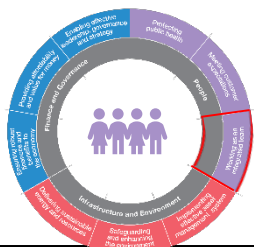
**Documents reviewed:** Welsh Water, 2018k, Welsh Water 2018m, Welsh Water, 2018q, Welsh Water 2018r, Welsh Water, 2018q, Welsh Water 2018s, Welsh Water & ORC, 2017

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Preliminary Industry benchmark			
		Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Scheme Wales' (Welsh Water, 2018q). The Ageing Workforce Strategy seeks to address inclusion of the increasingly ageing but highly experience workforce.</p> <p>Connecting beyond Welsh Water about these issues, Welsh Water is a member of the EU Skills Diversity group and the Equality and Human Rights Commission's 'Working Forward' Initiative. Welsh Water won the Chearae Teg Womenspire Award 2017 as 'Employer of the Year' and in 2018 was shortlisted for the 'Fairplay Employer' award. Finally, Welsh Water is bilingual. Learning the language is actively promoted and Welsh language speakers are available to engage with native speaking customers (Welsh Water, 2018k).</p> <p>Though there are a number of promising initiatives underway, these must be coordinated through business-wide strategy and set of plans to ensure impact and resilience.</p> <p><b>Whilst there is still some way to go to deliver a truly diverse workforce Welsh Water has pilot initiatives in place to move towards this, and an Equality, Diversity and Inclusion strategy has been produced, scoring a level 3.</b></p>	<p>the roll out from senior teams to the wider workforce.</p> <ul style="list-style-type: none"> <li>Specific focus on contemporary 'inclusion' good practice during recruitment and induction.</li> <li>Undertake targeted recruitment particularly for ethnic minorities in communities, which are currently under represented in the organisation.</li> </ul> <p><b>Based on the delivery of their Equality, Diversity and Inclusion Strategy, we expect Welsh Water to achieve a level 4 in the future.</b></p>	Level 3	Level 4	Level 2.9	Level 3.6
<p><b>Areas to enhance:</b></p> <ul style="list-style-type: none"> <li>Embed the Equality, Diversity and Inclusion Strategy – with explicit leader and manager accountability, targets and recognition (beyond HR)</li> <li>Embed diversity and inclusion competencies, training and practices within hiring, induction, performance management and promotion activity (including team curation)</li> <li>Network diverse groups of employees and stakeholders around key strategic issues / decisions – promoting greater diversity of thought and perspective</li> </ul>					



## 4. Resilience assessment for Welsh Water: People Working as an integrated team



### Assure suitable recruitment, remuneration and benefits

#### What leading looks like (Level 5):

The company identifies and plans to fulfil the requirements of their future workforce. The company attracts and is seen as the first choice for highly skilled individuals, who also want to stay at the company to develop their careers. Staff should also feel that the remuneration and benefits are right for the work that they do.

**Documents reviewed:** Welsh Water 2018a, Welsh Water & ORC, 2017

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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**Preliminary  
Industry benchmark**

#### Welsh Water's performance now

Over the past 10 years, Welsh Water has grown from 200 to over 3,100 staff; merging across disparate companies in an attempt to bring key outsourced processes and capability back in-house to support growth. Keeping focus on operational integration has understandably been a focus to ensure water supply and customer service are not effected. Given its geography, Welsh Water experiences challenges in both hiring (and contracting) for high in-demand skill sets (e.g. quantity surveyors and data scientists) and enabling talent mobility and promotion (due to low attrition / high retention). It was noted that when recruiting staff there is sometimes a disproportionate focus on technical competency rather than softer skills and emotional intelligence that has caused some issues in some teams. To redress the balance, business psychologists are developing a candidate screening tool to ensure Welsh Water hires people with a customer focused, flexible, 'can do' attitude<sup>11</sup>. Welsh Water is aware of these issues and is working at an individual, organisation and industry level to address this.

In response, Welsh Water is about to embark on a strategic workforce planning process to identify critical skills it needs now and for the future to better direct talent attraction, development and retention. Welsh Water has already identified current skills gaps, which include engineers and quantity surveyors and is working to fill these gaps. Welsh Water is actively working with schools and universities to educate and entice future talent to develop STEM skills and careers; offering work experience, projects (Education Engineering Scheme Wales) and experience days. For example, Welsh Water is working with Hereford University to sponsor students through their technical skills programme. They are also working with Network75 and the Resilient Communities programme to ensure that there are Welsh Water role models for STEM careers in isolated or deprived communities. Welsh Water is working with the Princes Trust on programmes like Get into Construction, to grow skills in key locations both for themselves and their supply chain.

The Welsh Water apprenticeship and graduate programmes are well regarded, with applications growing year on year bringing in new talent and focusing on developing key capability early on and in-house. Over 200 graduates and apprentices have been brought into the business since 2010. There is also an established annual talent review process that focuses on succession to senior and critical roles and retention risks that relate to these roles. For example, ICA / Telemetry skills have been in short supply. Welsh Water has developed a targeted apprenticeship programme aligned with a review of T&C's to maintain the right level of resource in the organisation. There are a number of 'key investment' programmes (e.g. the Digital Inclusion, Customer Service and Enhancing innovation) that seek to develop skills and capability that are of strategic future important to the industry. To further incentivise employees interested in developing their Engineering, Science and Surveyor capability further, Welsh Water has introduced a policy to support and fund their chartership accreditation. Additionally, Welsh Water has begun to network with the Alliance, EU Skills Talent Network and cross industry suppliers to discuss partnering to address skills shortages commencing with a joint cohort of apprentice quantity surveyors in September 2018.

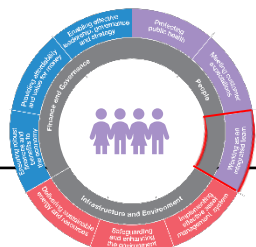
#### Welsh Water's plans for AMP7 and beyond

There is some encouraging evidence of people resilience activity in certain parts of the business. For example, horizon scanning is taking place in particular areas of the business (e.g. Retail). There is also a plan for the Retail team to become more flexible - offering benefits both in terms of working patterns and workspace. Roles that traditionally took place in call centres, will be increasingly flexible to home working, Retail has an aim to have 20% of staff homeworking by 2025<sup>11,19</sup>.

#### Now AMP7 & beyond

Now	AMP7 & beyond	Now	AMP7 & beyond
Level 2	Level 4	Level 2.9	Level 3.6

## 4. Resilience assessment for Welsh Water: People Working as an integrated team



### Assure suitable recruitment, remuneration and benefits, continued

**Documents reviewed:** Welsh Water 2018a, Welsh Water & ORC, 2017, Glassdoor, 2018, Welsh Water 2018q

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Preliminary  
Industry benchmark

#### Welsh Water's performance now

Further validation of this activity, post workforce planning will be essential. Also, the majority of this work is being driven by a small HR team. As the company grows, this is not a sustainable model. Welsh Water is aware that there is more work to be done to ensure business leaders and hiring managers are recruiting, managing and promoting talent in areas of shortage and future critical strategic need.

The employee engagement survey 2017 shows an increase in score for 'I would recommend Welsh Water as a great place to work'. This, coupled with high retention, suggests that staff are happy with the reward for the work that they do. Welsh Water has soft-launched 'Employment for Communities' which commits to the living wage and other no regret decisions<sup>19</sup>.

Welsh Water has a good relationship with Trade Unions through the 'Working Together Agreement' which has been in place for 25 years and has not experienced any industrial action since then despite making significant changes to employee terms and conditions, shift patterns and pension provision. For example, it closed its Defined Benefit pension scheme to future accrual on 31 March 2017 after a successful consultation period in which members opted to close the scheme. The agreement promotes a joint problem solving approach an example of which is the recent performance management training with managers and trade union representatives participating together. Welsh Water rewards performance for its front line teams with a Colleague Reward Scheme based on company performance and its managers participate in an Annual Variable Pay Scheme with both company and personal targets. Welsh Water is currently paying higher salaries for key skills (e.g. procurement and data scientists), due to market demand and in order to attract key roles to relocate.

Finally, flexible working is both a need (given disparate geography) and a challenge. More investment in the technologies required to enable this is needed. Weather incidents have put pressure on staff and customer service which could have been mitigated with the benefit of more agile, home working. Welsh Water is aware of these issues and beginning to address these issues as priority projects for this year.

**Welsh Water has HR systems and processes in place to recruit and retain staff. It has committed to developing a strategic workforce plan, but this remains a work in progress, so currently a level 2 is scored.**

#### Welsh Water's plans for AMP7 and beyond

Other AMP7 Retail initiatives include a centralised resource planning function, design of a Reward and Recognition Strategy that is reflective of other call centre operations and working with minority groups and representatives of disadvantaged communities to promote employment opportunities. Welsh Water has committed to developing a strategic workforce plan which will be a live document hosted in SAP. This will enable better management of the workforce from talent planning to day to workforce planning. This can be used to identify the new roles, graduate and apprentices needed to fill future skills gaps<sup>11</sup>.

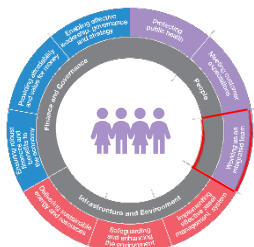
If Welsh Water is able to connect and leverage this capability, there is a more positive outlook for the future.  
**Should Welsh Water be successful, we project an improved score of 4 for AMP7 and beyond.**

Now	AMP7 & beyond	Now	AMP7 & beyond
Level 2	Level 4	Level 2.9	Level 3.6

**Areas to enhance:** Should strategic workforce planning activity take place and the outcomes be owned by leaders and managers in the business, Welsh Water would be able to demonstrate greater people resilience for AMP7 and beyond. The following present opportunities for Welsh Water to enhance its maturity in this area:

- Connect and leverage pockets of existing good practice across the business (e.g. Retail)
- Connect workforce planning activity directly to strategy, business plans, targets, hiring and promotion
- Assign business accountability for results in the short, medium and long term (beyond purely HR)
- Address need for flexible / home working as a new norm (and as mitigation against future incidents)
- Continue to partner across industry to grow industry, business and resilience-critical capability

## 4. Resilience assessment for Welsh Water: People Working as an integrated team



### Establish a plan for career progression and succession

#### What leading looks like (Level 5):

Every employee should have a bespoke career progression plan which is reviewed regularly and used as a basis for decision making when assigning new projects and roles as well as providing training. The staff feel like they have control over their career and can see that they are progressing accordingly. They ensure they have workforce continuity plans to identify skills gaps between their current and future workforce. Ensuring that these can be filled through training and development and succession planning. All knowledge and skills are effectively captured before people move on or retire so that other can effectively take over.

**Preliminary  
Industry benchmark**

#### Welsh Water's performance now

Welsh Water promotes development and succession planning and undertakes six monthly appraisals and assessment for all staff. The Annual Talent and Resource Review gives the responsibility to develop teams and succession plans to managers (Welsh Water, 2018a), supported by HR. This is facilitated through the Talent and Resource Review Dashboard and the online performance management system which includes succession management, development and training<sup>11</sup>. Tailored development for successors identified as high potential, is led and managed through HR. There are also programmes to further develop staff into more senior roles such as the Welsh Water Leadership Programme which includes coaching and mentoring schemes (Welsh Water, 2018a). There is, however, less clarity for staff about the new skill areas that will be required for resilience. A career development programme (Pathways) supports staff to understand potential future roles, this could be better aligned with future business needs.

Welsh Water has an annual turnover rate of 9.2%, with Retail highest at 20.3% and Wastewater lowest at 4.9% for 2017/2018. The business average for length of service for 2017/18 is 10 years, but 18.7% of staff remain with Welsh Water for over 20 years. This suggests that for much of the business, both talent mobility (due to talent blockers) and retention of deep institutional knowledge and experience will be risks (Welsh Water, 2018p). It has however, through training, tackled poor performance more directly to drive mobility. In addition, Welsh Water has an 'Ageing Workforce Fitness for Work Strategy' which could support reskilling and mobility of the ageing workforce; creating new career opportunities for many.

Welsh Water has a company level Succession Plan – highlighting areas of specific risk. In particular this sets out development plans for 'high risk' roles such as succession for the Executive team and other senior or specialist roles. This is reviewed on a 6 monthly basis by the main Board. Welsh Water considers some impacts to the future workforce, including national scale infrastructure projects, looking 10 years into the future<sup>11</sup>. Welsh Water has an employability skills programme with a focus on STEM roles and joint apprenticeship programmes between Welsh Water and Alliance partners<sup>11</sup>. These schemes have been running for eight years and cover 30 key skills. Welsh Water plans to expand the number of internships and work experience placements which are promoted through schools, colleges and university contacts. Welsh Water has recently been shortlisted for the School Leavers Award 2018, and the BITC Inspiring young talent award. Welsh Water has also been shortlisted for two awards with Business in the Community to recognise graduate and apprentice programmes and health and well-being of colleagues in 2017 (Welsh Water, 2018q).

#### Welsh Water's plans for AMP7 and beyond

Welsh Water's focus in AMP7 includes:

- Targeted recruitment of graduates, apprentices and trainees derived from detailed operational succession plans.
- Further enhancement of competency frameworks for individual roles in the organisation to ensure contemporary capability aligned to the overall company business plan, e.g. customer service, technology, technical capability and innovation.
- Continued investment in management and leadership capability through the Board lead succession planning process. With particular focus on mitigating key operational succession risks.

#### Now

**Level  
2**

#### AMP7 & beyond

**Level  
4**

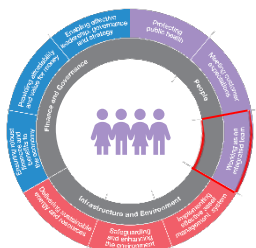
#### Now

**Level  
2.9**

#### AMP7 & beyond

**Level  
3.6**

## 4. Resilience assessment for Welsh Water: People Working as an integrated team



### Establish a plan for career progression and succession, continued

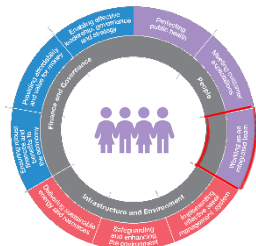
**Documents reviewed:** Welsh Water 2018a, Welsh Water, 2018p, Welsh Water 2018q

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Preliminary Industry benchmark			
		Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water is about to begin a strategic workforce planning exercise to identify current and future skills gaps – directing the necessary investment required to buy, build, borrow or automate the capability necessary to ensure the resilience. This work will help to identify incumbent staff potential, direct career conversations, talent and succession.</p> <p><b>Until this plan is in place, Welsh Water scores a 2, because they have not yet developed a comprehensive response.</b></p>	<p><b>Welsh Water has plans to improve succession planning and operational flexibility to meet future needs through strategic workforce planning, which will be a live document scoring a level 4 for AMP7 and beyond.</b></p>	Level 2	Level 4	Level 2.9	Level 3.6
<p><b>Areas to enhance:</b> Identify long term skills and capability requirements through strategic workforce planning to direct attraction, recruitment, development and promotion; Link findings through to existing initiatives to ensure alignment to delivering resilience outcomes.</p>					



## 4. Resilience assessment for Welsh Water: People Working as an integrated team



### Establish a collaborative and adaptive organisational culture

#### What leading looks like (Level 5):

The company has an organisational culture that puts people resilience at the heart of all that they do. All employees understand the overarching vision and resilience objectives of the company and how their individual roles feed into and facilitate this, working together across boundaries in the service of customers and the community. Employees feel engaged in the work the company undertakes. Learning, collaboration and flexibility to future change is key and evident in short medium and long term management, not simply in one-off innovations and in response to major 'events'. There is effective internal collaboration and communication between all of the teams.

**Preliminary  
Industry benchmark**

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water has a notably strong culture (experienced onsite and through interviews) enabled by regular leadership communication and a clear set of shared values. Some described it as 'a family'. There has been specific focus on integrating 'three cultures into one' as the company has grown through in-sourcing of operational activities from United Utilities and Kelda Water Services in 2010. In 2016 it insourced income and billing activities and is working to integrate c500 colleagues with its "One Welsh Water" engagement action plan workstream. Leaders are key influencers of culture. The company vision and mission is shared through employee roadshows where the executive teams regularly visit teams across the country. Its hands on and engaged CEO is noted as a key contributor to the discretionary effort many Welsh Water staff give to the company, specifically demonstrated during incidents. There are regular leadership roadshows, site visits and calls that connect leaders with colleagues and help to create a greater sense of involvement inclusivity. According to the 2017 Employee engagement survey, staff 'feel a strong sense of belonging to Welsh Water' and 'would recommend Welsh Water as a great place to work'. Welsh Water has recently been awarded 'Gold' level for 'Investors in People' (IIP), with feedback that there is a high level of understanding of vision and values. This is a level only achieved by 7% of IIP accredited organisations in the UK.</p> <p>Welsh Water has recognised the need to have inhouse change capability by creating a 'Change Committee' which will meet monthly. They have promoted someone into a newly created change programme manager role, and recruited transformation mangers into areas of the business like retail and capital delivery. These are connected to the company's leadership and their long term strategy Welsh Water 2050<sup>11</sup>. The current Culture Change Progress Plan, and x-matrices lists a series of initiatives that may support Welsh Water's culture and resilience. It is, however, not yet clear how these initiatives stack up to deliver on specific long term resilience, behaviours, culture and change challenges and outcomes.</p> <p>Welsh culture and language is celebrated within Welsh Water, and this diversity is encouraged. Strong cultures can either be enablers or blockers to collaboration and change. Sharing of good practice across business lines still remains a challenge for the company<sup>7,12</sup> and many reported siloed working and collaboration to be an issue for Welsh Water. This is said to be exacerbated by dispersed geography and lack of technology to enable virtual working. Organisation wide efforts, such as Lean and Innovation are reported to have delivered successfully in pockets, but successes could be shared and leveraged across the business for greater impact. It was noted that more could be done to address siloed working and sharing across the business areas.</p> <p>Two areas for suggested Welsh Water focus noted in the 2018 Employee Engagement Action Plan are promoting 'Better cross-team collaboration' and making it 'safe to speak up and challenge the way we do things' (Welsh Water &amp; ORC, 2017). These indicate the need for Welsh Water to invest in change initiatives that drive greater cross-business communication and collaboration.</p>	<p>Welsh Water has stated that it will develop a change programme in AMP7 to embed long-term resilient thinking across the organisation and deal with change (Welsh Water 2018v).</p>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 2.4</b>	<b>Level 3.1</b>

**Documents reviewed:** Welsh Water & ORC 2017, Welsh Water 2018v

Level 1: Unaware  
of indicator

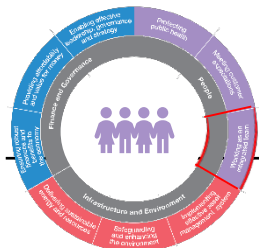
Level 2: Aware a  
response should  
be developed

Level 3:  
Response  
developed

Level 4:  
Response in  
progress

Level 5:  
Leading

## 4. Maturity assessment for Welsh Water: People Working as an integrated team



### Establish a collaborative and adaptive organisational culture, continued

Documents reviewed: Welsh Water & ORC 2017

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Preliminary  
Industry benchmark

#### Welsh Water's performance now

Welsh Water noted that the pace and delivery of change over the last five years has been rapid and relentless. For example, the company was able to implement a new online performance management system within three months in 2018. There is a Change Management Board made up of senior leadership. Historically, the approach was seen by some to be too IT change-centric and a new, broader change governance structure has been developed. It was noted that when committed to change, Welsh Water is quick to respond but that this is often in reaction (rather than proactively responding) to change. Welsh Water is aware of these issues through staff and leader engagement. There are 100 Engagement Champions (externally trained by ORC). Their role is to collectively listen, understand and create local action plans to address engagement issues within local business areas and across regional teams<sup>11</sup>. The Engagement Champions proactively network with the Executive team. 83% of the workforce completed the Employee Engagement Survey (Welsh Water & ORC, 2017). 90% of staff think that there is a culture of looking to improve the way they work. 77% of staff think that they are encouraged to come up with new ideas<sup>11</sup>. These indicate that separate initiatives are having an impact.

Welsh Water's new Leadership Programme was launched in 2018, and aims to equip all People managers with leadership and coaching skills and a framework that promotes consistent leadership practices across the business. Aspiring leaders also have the opportunity to participate on a bespoke Innovation Programme developed in partnership with Cardiff University. Cross-business leader rotations (between Water and Wastewater and across regions) are also in progress – developing and broadening leader perspective, experience and potential for greater collaboration (through shared experience). In addition, the four business areas leaders are now reporting to the same executive (suggested as a another solution to addressing this). Welsh Water also recognises a 'team of the month' company wide – promoting more multi-disciplinary, cross team working.

A number of planned initiatives were discussed and noted in interviews, and documented in the Culture Change tracker within the Annual Talent and Resource 2018 pack. However, evidence of how these are being coordinated into an explicit business-wide Organisational Design (OD), culture or change efforts that address current and long term business and people resilience challenges, is difficult to track. More importantly, how Welsh Water engages leaders and stakeholders to identify people resilience challenges; and integrate these within their strategies /business plans, processes and practices, will determine whether a 'response developed' score can be achieved.

**With the proposed development of business wide Organisational Design strategy showing collaboration, integrated resilience and longer-term objectives, a level 2 is scored as this plan is still to be developed.**

#### Welsh Water's plans for AMP7 and beyond

**Welsh Water is in the process of developing an explicit Organisation Design strategy in AMP7 to successfully embed and deliver business plan objectives, it scores a level 3 for the future.**

At present, there is less evidence that this will also achieve stated long-term resilience objectives. Extending the extent and the outcomes of this programme this could enable Welsh Water to score level 4 in the future.

#### Now

Level  
2

#### AMP7 & beyond

Level  
3

#### Now

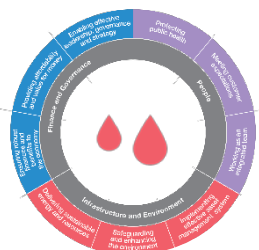
Level  
2.4

#### AMP7 & beyond

Level  
3.1

#### Areas to enhance:

- OD / Culture Change Strategy (in support of WW2050 and PR19 Business Plan). As the company grows, more established mechanisms will be required, beyond communication and engagement planning.
- Embedding collaboration and change capability into competency frameworks for recruitment, performance management and reward, as well as team development.
- Developing / insourcing change capability (alongside innovation); making the most of the new change governance, encompassing a remit on cultural change.
- Increased focus on senior team effectiveness, virtual teaming and multi-disciplinary team working



## 5. Resilience assessment for Welsh Water: Infrastructure and environment

### Key findings

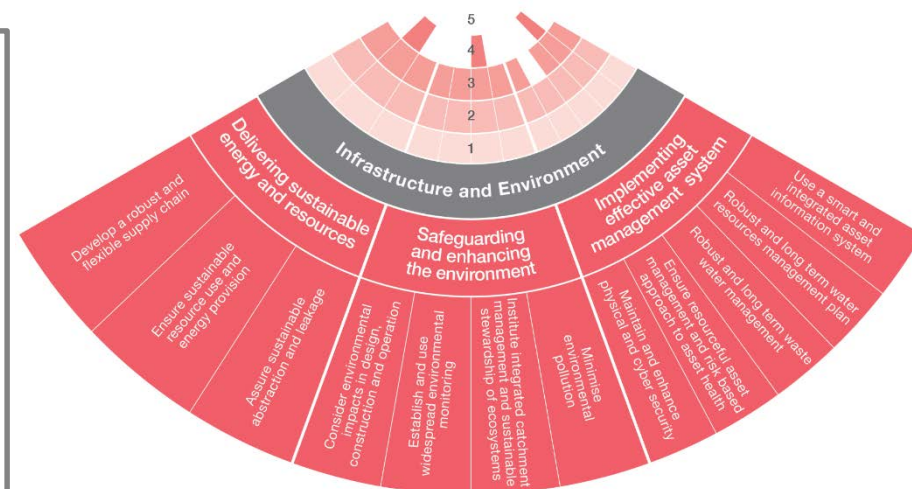
#### Areas of strength

- There is a Smart Strategy in place with a comprehensive plan for technology and cyber development and future implementation, this adoption of alternative strategies shows an ability to respond to changing circumstances.
- Work to reduce pollution of water sources is in progress, this includes measures such as the WaterSource programme, including the BBMC, Weed Wiper and PestSmart. These measures are reflective and flexible, improving the organisation's resilience by education land owners.
- Future plans for catchment management with regards to Central Cardiff Flooding and SMNR, are inclusive and show flexibility to approaches in catchment management.
- Sustainable energy generation is becoming integrated into business as usual, and energy efficiency and biodiversity is starting to become part of the Gateway process, which means that resilience is considered earlier.
- Project Cartref and 'Wrap up Wales' are inclusive programmes, to help customers reduce leakage to meet the 15% leakage target in AMP7.
- The future plan to develop services for proactive monitoring and modelling of air quality and odour is progressive and integrated, investigations into sharing data with other bodies allows for collaboration and shared ownership of decision-making.
- Research is being undertaken to develop a system-wide approach to asset health, this integration of assets should lead to more resilient and robust systems.

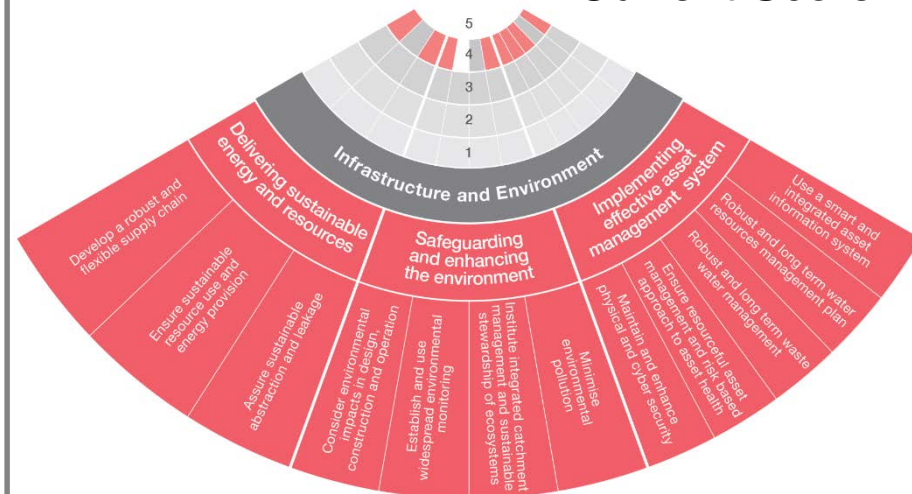
#### Areas to enhance

- Supplementation of current plans with investment in people and processes to deliver the plans particularly relevant to the smart and cyber changes, but also across the business.
- Ensuring that if pilots are successful, plans are created to roll them out, and that the geographical scale is sufficient to meet the requirements of the DWMPs.
- There is an opportunity to test the draft WRMP with real scenarios and longer planning horizons.
- Review of the SAMP to include resilience plans and processes and to look at system-wide approaches rather than asset resilience in isolation, inclusion of update and review process for document.
- Opportunity to combine NRW data with Welsh Water data on a platform so that it can be used as part of the business as usual decision making process. For example, using as part of decision making before Gateway 1.
- Further consideration of environmental enhancements, including rolling out Biodiversity Champions more widely and collecting a more comprehensive dataset.
- Opportunity to enhance the robustness of the skills supply chain and to share business wide future procurement needs over a longer time period with the supply chain.

Level 5 Leading	<b>Interviews:</b> Arfon Edwards <sup>4</sup> , Clive Hardy <sup>5</sup> , Brendan McAndrew <sup>6</sup> , Dale Walker <sup>7</sup> , Dave Collins <sup>9</sup> , Martin Hennessey <sup>12</sup> , Mike Pedley <sup>14</sup> , Sharon Ellwood <sup>20</sup> , Sian Robinson <sup>21</sup> , Tony Harrington <sup>22</sup> , Wayne Arscott <sup>23</sup> , Alun Shurmer <sup>24</sup> , Chris Jones <sup>26</sup> , Will Rees <sup>27</sup> , Chris Jones <sup>26</sup> , Chris Jones <sup>28</sup> , Ian Christie <sup>29</sup> , Steve Wilson <sup>30</sup> , Nick Parkin <sup>31</sup> , Amanda Soady <sup>32</sup> , Scott Beard <sup>33</sup> , Marek Cegielski <sup>34</sup> , Peter Perry <sup>36</sup> , Fergus O'Brien <sup>37</sup>
Level 4 Response in progress	
Level 3 Response developed	
Level 2 Aware a response should be developed	
Level 1 Unaware of indicator	

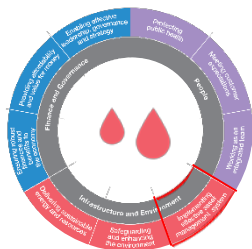


Current Score



Future Score

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment Implementing effective asset management systems



### Use smart and integrated asset information systems

#### What leading looks like (Level 5):

All systems are smart, integrated and use real-time data, so that any changes in conditions can be accounted for. They have redundancy and adaptability as core requirements and network models should exist for all catchments and should be dynamically linked to a central asset information database that is continually updated.

Level 1: Unaware of indicator

Level 2: Aware a response should be developed

Level 3: Response developed

Level 4: Response in progress

Level 5: Leading

		Preliminary Industry benchmark			
Welsh Water's performance now		Welsh Water's plans for AMP7 and beyond		Now	
				Now	AMP7 & beyond
<p>IT and OT at Welsh Water includes legacy systems, equipment and assets, so there is a large programme of work to maintain and update them. Welsh Water's data and systems are not currently interoperable, with separation between the IT and OT estates<sup>7</sup>.</p> <p>The Smart Strategy looks at embedding new technology in the business and will require changes to the business and current ways of working. A feasibility study has been undertaken in AMP6, which determined that the Smart Strategy will be implementable in AMP7<sup>7</sup>. This plans seven to eight years into the future and is reviewed every three years. Data and information from technology experts are incorporated into the planning<sup>7</sup>. This strategy provides a direction of travel rather than a long-term implementable plan.</p> <p>The SmartHub monitors data from Welsh Water's operational assets, and includes teams focused on risk and response. There is business appetite to expand the SmartHub, but the skills capacity is not available, e.g. more data scientists would be required<sup>7</sup>. A key challenge is how to use the data collected on projects, sensors are installed but the OT teams need to know about it to ensure security<sup>9</sup>. There is significant amounts of data collection undertaken across the business which are often not collected in suitable formats<sup>9,14</sup>. Consideration is not always given to why data is being collected<sup>9</sup>. Often bespoke systems have been created which take a long time to develop: agile working is a focus for the future. Better use of apps and smart phones would mean cheaper and quicker ways to implement options<sup>9</sup>. Technology like a mobile app for leakage inspectors and smart spreadsheets are in progress<sup>7</sup>.</p> <p>The wastewater business is focusing on smart projects to reduce flooding and pollution through improved ways of dealing with blockages. This includes ICMLive which provides real-time operational forecasting, blockage risk modelling, smart networks, implementing telemetry and improving management, and condition based modelling of critical equipment (MaRS). This work will be carried on into AMP7.</p> <p><b>The Smart Strategy and IT Strategy demonstrate clear plans in place, to score a level 3.</b></p>		<p>Welsh Water is currently building strategies into the business plan to implement innovation from new suppliers, prototypes and research. This is called the Smart Plan and is an implementable plan to 2025.</p> <p>There is a feeling of expectation to do new and more advanced control and automation, however this presents a new cyber threat. Welsh Water is monitoring advances and investment needs in this area.</p> <p>Welsh Water is also planning to implement a 'demilitarized zone', or 'data lake' to make it easier to share data between IT and OT estates and provide access securely to other public bodies. It is also looking into how to share data more widely on open and public platforms.</p> <p>Funding is available for the development of technology that does not exist, as well as expectations that innovation for raw water quality testing will be made operational in AMP7<sup>7</sup>.</p> <p><b>Delivery of the Smart Strategy and IT Strategy are expected to help Welsh Water score a level 4 in the future.</b></p>		Level 3	Level 4
				Level 3	Level 3.8

#### Areas to enhance:

A plan with technology investment in AMP7 has been developed, in order to make the most of this investment, more detailed plans for the people and process change required to support this would be beneficial.

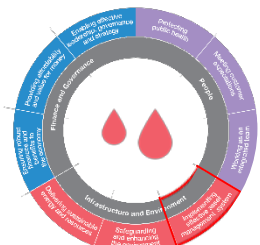


## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Implementing effective asset management systems

**Documents reviewed:** Ofwat PR19, Welsh Water 2018c, Welsh Water 2018a

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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### Robust long-term water resources monitoring and management planning

#### What leading looks like (Level 5):

Long-term water resource management planning and drought planning has been integrated into business planning to facilitate long term sustainable growth. This plan is reflective, and reviewed and updated regularly. Furthermore there should be mechanisms in place which ensure that all current and future programmes align with this strategy. Plans are produced collaboratively with the Environment Agency (EA) and regional planning groups to ensure best value for customers with respect to cross-company, regional and national supply options.

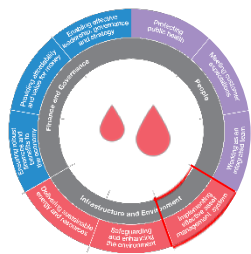
Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water published its draft WRMP 2019 in March 2018. The draft WRMP assessed the water supply and demand in water resource zones (WRZs) between 2020 and 2050, and showed that all except two have a surplus during the planning period. For the WRZs in deficit, Tywyn Aberdyfi and Pembrokeshire, the draft WRMP outlines high level solutions to address the deficit. The selected planning horizon of 2050 aligns with the Welsh Water 2050 vision, however it does not provide visibility of future tipping points where there may be a deficit beyond 2050.</p> <p>Ofwat introduced a metric in PR19 regarding long-term drought resilience. In response, the draft WRMP tests the resilience of each WRZ to a 1 in 200 year drought event, and identifies where further work will be required in AMP7 to maintain local supply. Resilience is only considered at a high level from a drought and climate change perspective.</p> <p>The draft WRMP outlines the decision making process used to appraise options to address a deficit in water supply. It states the intention to identify 'best value' solutions, however the focus in this WRMP has remained on 'least cost' solutions which are first identified then sensitivity tested to confirm that they are the 'best value' solution<sup>5</sup>.</p> <p><b>The draft WRMP is in place so scores a level 4.</b> It would need to look further into the future with clear scenarios to score a level 5.</p>	<p>Welsh Water has discussed potential high level options for water trading with Severn Trent Water and Thames Water. Further work is required to agree specific terms and discuss options with Welsh Government.</p> <p>Welsh Water is planning to improve the resilience of the Felindre Trunk Main, a major link between South East and South West Wales. It has identified 34 risk points along its length, which has provided the baseline for phased improvements in the coming years. The organisation is also planning to replace the Bwlch Tunnel, enabling two-way capability between Anglesey and the mainland, and to link the Vowchurch and Hereford WRZs. This is part of a wider approach to build resilience of supply by linking WRZs. There are plans to create a combined WRZ and demand management strategy in AMP7.</p> <p>Welsh Water 2050 identifies the partners that Welsh Water will collaborate with to ensure the water supply demand balance to 2050.</p> <p><b>No changes are planned that would lead to a change in score.</b></p>	Level 4	Level 4	Level 3.7	Level 4.4

**Areas to enhance:** Welsh Water has undertaken thorough plans for water resource management through the draft WRMP. This approach could be strengthened and made more robust by considering some of the following aspects:

- Real scenario testing, which is wider than climate change and drought. This could include asset failure from other shocks and stresses like environmental change.
- Longer planning horizon, which considers a longer timeframe than 2050 and understands the 'tipping points'.
- Water quality challenges as part of its planning, which will impact upon the useable resource level that the organisation can feasibly exploit.

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment Implementing effective asset management systems



### Robust long-term wastewater planning

#### What leading looks like (Level 5):

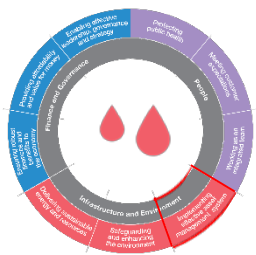
Wastewater planning is undertaken for the long term enabling sustainable growth in the region without impacting existing customers. Wastewater plans are developed with stakeholders and integrated into their business plans. They focus on critical service failures such as internal sewer flooding and pollution incidents.

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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		Preliminary Industry benchmark			
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water currently has Sustainable Drainage Plans (SDPs) across all catchments which help the company implement the right investment to fulfil their duties and plan for the future. These assess current and future risks for these catchments and identify solutions and associated benefits. Linked to these SDPs, Welsh Water undertakes engagement with NRW, EA, local authorities and local flood authorities<sup>37</sup>. Welsh Water currently manages risks to wastewater assets using an Investment Manager (IM) system to identify the highest and most frequent risks<sup>20</sup>.</p> <p>Welsh Water's pollution incidents, by severity and number, have significantly reduced, partly due to falling blockage rates. This is the result of campaigns such as 'Let's Stop the Block'. Current projects are in place to collect data to feed into long-term planning and management. These include:</p> <ul style="list-style-type: none"> <li>ICMLive, which provides operational forecasting for Welsh Water to proactively manage networks.</li> <li>Blockage risk modelling, provides a model to map high risk areas to.</li> <li>Smart networks, with more telemetry implemented decisions can be supported by data.</li> <li>EDM monitoring at 100% of CSO will be implement by the end of AMP6. This data can be used to plan investment in the future<sup>20</sup>.</li> </ul> <p>Welsh Water is one of the leads of the 21<sup>st</sup> Century Drainage Programme, working in partnership with over 40 organisations in the water sector to address major risks for drainage in the future and provide options for how these risks could be addressed through processes such as the Drainage and Wastewater Management Plans (DWMPs)<sup>22</sup>.</p>	<p>Welsh Water is continuing to undertake detailed catchment level wastewater planning approaches in AMP7 in Cardiff East and Central catchments and Afan catchments. There are plans to continue to invest in RainScape and continue to work in partnership with stakeholders and communities to implement these projects.</p> <p>In AMP7, Welsh Water is investing in the cross sector leading approach of sustainable management of natural resources (SMNR). This involves collaborating with partners such as NRW, Local Authorities and other stakeholders to work together to improve catchments. This is being trialled in three catchments and if found to be successful then could be a key sustainable way to improve and maintain catchments, RainScape schemes and the environment in the long term.</p> <p>Welsh Water plans to develop the SDPs into DWMPs. These DWMPs aim to deliver integrated long-term planning for wastewater networks and treatment systems, improving asset resilience and health as well as enhancing service delivery. Welsh Water recognises that DWMPs are at a larger scale than the SDPs so they will need to update their current approach<sup>37</sup>. Welsh Water plans to integrate DWMPs into the IM, in order to prioritise longer-term solutions rather than short-term fixes<sup>20</sup>.</p>	Level 3	Level 4	Level 3.1	Level 3.7

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Implementing effective asset management systems



### Robust long-term wastewater planning, continued

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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		Preliminary Industry benchmark			
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
Welsh Water has a plan to develop DWMPs, which scores them a level 3.	<p>There are plans to continue and further develop blockage mapping to consider consequences and to roll out the pilots undertaken in AMP6 to larger areas to support significant reductions in pollution and internal sewer flooding.</p> <p>Welsh Water 2050 also identifies the supply chain partners that Welsh Water will collaborate with to protect critical wastewater assets. Welsh Water has recently updated how they deal with their worst served customers, who experience internal and external sewer flooding, with new minimum service standards due to be implemented in AMP7. Welsh Water has committed to suspend billing to any customers who are not provided with acceptable service levels.</p> <p><b>The DWMPs will be developed in the future which will score Welsh Water a level 4.</b></p>	Level 3	Level 4	Level 3.1	Level 3.7

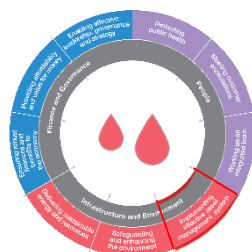
#### Areas to enhance:

There is an increasing focus on dealing with pollution and internal flooding in AMP7. Many of these programmes are in pilot stages or plan to be developed in AMP7 and if found to be successful will need to be rolled out across the business.

The development of the SDPs into DWMPs may need further work to ensure that the geographical scale is sufficient to meet the requirements of the DWMPs.

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Implementing effective asset management systems



### Ensure resourceful asset management and a risk-based approach to asset health

#### What leading looks like (Level 5):

A comprehensive assessment of asset risk has been undertaken, including long-term low-likelihood risks. There is detailed and accurate information on the state and health of assets, the way they are configured and the way they are managed and operated.

All asset management plans are long-term, redundant and resourceful. Furthermore, resilience and the resilience value of an asset is considered and is a driving force in all decisions made throughout the lifecycle of an asset. There is a region wide asset strategy which is adaptive, regularly reviewed and considers changing requirements in the long-term. They follow best practice for asset management, e.g. ISO 55000.

Suitable response and recovery plans are in place and are regularly tested and updated as required by each asset. Focus is on criticality, protecting customers and the natural environment from exposure to known risks, and reducing vulnerability to future uncertainties.

**Documents reviewed:** Welsh Water 2018e, Welsh Water 2018f, Welsh Water 2017a

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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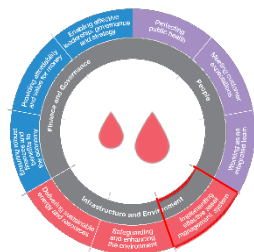
Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>The performance of asset management systems is reviewed against ISO55000 (Welsh Water, 2017a). This standard requires, and therefore Welsh Water has, both Asset Management Plans and a Strategic Asset Management Plan (SAMP). The Welsh Water SAMP, which is a high level strategic plan which documents the relationship between asset management objects and organisation objectives, is in the process of being updated to align with Welsh Water 2050. This is an excellent opportunity to revisit their SAMP and their asset management plans and processes to incorporate resilience.</p> <p>Welsh Water recognises that they are facing pressures from more frequent extreme weather events and a growing number of assets beyond their design life. Welsh Water has responded and is growing the emergency response teams and broadening their skills with more analytical and management support. The emergency response is further being improved by the revision of some of the continuity plans, however, there are insufficient resources at present to review all of these plans annually and some of these plans are not regularly tested.</p> <p>Welsh Water's risk management software (IM) focuses on assets that have had a past failure or have high probability for failure. However, it does not yet include deterioration modelling. Assets with a high impact but low likelihood are often left in the system for long periods<sup>6</sup>. Data collection to update this process to incorporate system resilience has been undertaken. A wider understanding of what constitutes an acceptable risk would improve this process<sup>12</sup>.</p>	<p>Welsh Water is making changes to their Resilience Scorecard reporting to give more granularity<sup>4</sup>. Welsh Water has undertaken work to look at the wider system resilience. This work is to update IM but hasn't yet been integrated into the IM system. This includes consideration of scenarios and also captures potential mitigation. It is a method to capture local operator's knowledge of assets and to ensure that all significant risks are considered, even if they have a low probability or a high cost of mitigation. This process is focused on water and wastewater assets that provides service to 80% of the population<sup>6</sup>.</p>	Level 2	Level 4	Level 2.8	Level 3.6



## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Implementing effective asset management systems



Ensure resourceful asset management and a risk-based approach to asset health, continued

**Documents reviewed:** Welsh Water 2018e, Welsh Water 2018f, Welsh Water 2017a

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Preliminary Industry benchmark			
		Now	AMP7 & beyond	Now	AMP7 & beyond
<p>There has been significant work undertaken in some areas such as dams and reservoirs, including a proactive quantitative assessment of risk and consequence of failures of these assets (Welsh Water, 2018f).</p> <p>Critical water and wastewater assets have Resilience Scorecards, which are focused on understanding risk for individual assets. These provide an annual snapshot of the risk to these assets and have been undertaken since the beginning of PR14. The Scorecards consider the current risks from flood, coastal erosion, treatment, failure, access, control and power, along with the ability of Welsh Water to recover from service failures arising from those events, and hence the overall risk to asset operations. Security and Emergency Measures are also considered as part of the Scorecards. They take the form of a questionnaire which is sent to the operational team. These produce a percentage of asset resilience which is used as a factor to influence investment decisions<sup>4</sup>. In PR14, critical water assets scored 80% and wastewater scored 71%. This has been steadily increasing over the AMP and by the end of the AMP is predicted to be 87% for critical water assets and 78% for critical wastewater assets (Welsh Water, 2018e).</p> <p>The organisation is currently producing a planning tool to model capacity of the overall network, to understand how it can respond to WTW outages. This is currently being trialled in South East Wales.</p> <p><b>Welsh Water scores a level 2 because it has begun to develop an approach to asset risk assessment, through the Resilience Scorecards, but the link between the bottom up approach and the strategic management plan needs to be considered. There is an awareness of the need to address this and to develop and embed an asset management culture.</b></p>	<p>The proactive risk based approach to dam safety has led to an aim to invest significantly in improving these assets (Welsh Water, 2018f).</p> <p>If deemed successful, Welsh Water plans to expand its capacity modelling tool from South East Wales to the entire network.</p> <p><b>If Welsh Water can develop and embed an asset management culture, we believe they could attain a level 4.</b></p>	Level 2	Level 4	Level 2.8	Level 3.6

#### Areas to enhance:

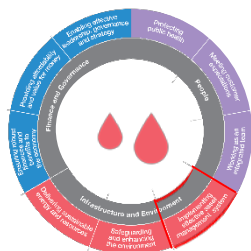
The SAMP could be reviewed from a resilience perspective and used as a living document, updated and reviewed regularly.

The Resilience Scorecards assess each asset in isolation, and not as a wider system, therefore they do not highlight potential interdependency of impacts. There has been some work undertaken to consider risk at a wider scale, but to enhance Welsh Water's work, strategic asset management should be used to enhance how the network is managed.

In order to truly take account of resilience, the Resilience Scorecards could be adapted to take account of higher impact, lower likelihood events, including linking to the corporate risk register and the challenges identified in Welsh Water 2050. The annual review of Scorecards should include business continuity plans in the event of shocks and stresses impacting on critical assets.

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Implementing effective asset management systems



### Maintain and enhance physical and cyber security

#### What leading looks like (Level 5):

Regular reviews of security systems efficiency are carried out for both physical and cyber security. At the same time the security strategies and designs are adapted regularly, based on horizon scanning, lessons learned and as new threats become clear.

Documents reviewed: Welsh Water 2018I

Level 1: Unaware of indicator

Level 2: Aware a response should be developed

Level 3: Response developed

Level 4: Response in progress

Level 5: Leading

Preliminary  
Industry benchmark

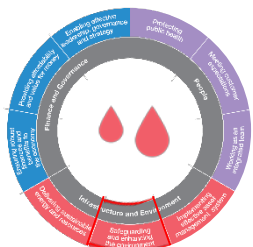
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>There are dedicated cyber security roles, and Welsh Water is looking to bring in additional personnel in areas of security and operational control. While Welsh Water's legacy assets provide some level of cyber security due to obsolescence they also present a security risk. Welsh Water has a cyber plan and Phase 1 of the cyber programme has been implemented.</p> <p>Welsh Water does not currently have the required technology skills to deliver on their resilience strategies, there is a skills gap and retaining people is a bigger issue than recruitment<sup>7</sup>. Continuity plans are in place, which consider physical security. Security and Emergency Measures are considered in Resilience Scorecards for critical assets.</p> <p>Welsh Water has six sites which are categorised as Critical National Infrastructure, which serve a population of over 350,000. These have stringent requirements for physical security and the upgrades required to meet these standards have been completed since 2013. Welsh Water's other assets have to meet the Water UK Security Standard. Welsh Water is currently in the process of upgrading sites and assets to meet these requirements. So far this has been achieved for 25 WTW<sup>27</sup>, with more sites to be addressed.</p> <p>The Resilience Scorecards include the risk to assets from various threats. There has been an improvement in the physical resilience of critical water and wastewater treatment works (WwTW). In addition, there has been significant modelling of conditions of dams through an industry leading Risk Assessment for Reservoir Safety (RARS) methodology.</p> <p><b>Whilst Welsh Water has established a process in relation to physical security, it has only partially implemented its plan for cyber security, thus scoring a level 3.</b></p>	<p>Welsh Water's plans to increase levels of automation also increases their risk from cyber threats which will need further investment. Methods to improve sharing of data without impacting security will need further consideration. Methods like their planned 'demilitarized zone' which provides a method to share secure access with public bodies is one way of doing this. Work on sharing data more widely on public platforms will need further investment<sup>7</sup>.</p> <p>Phase 2 of Welsh Water's cyber programme will be rolled out starting next year and continuing into AMP7<sup>9</sup>. Phase 3 of the cyber programme to improve secure transfer of data and enhancement to OT security is planned for AMP7 (Welsh Water, 2018I).</p> <p>Welsh Water 2050 has a focus on improving the physical security of critical water and wastewater assets. This investment plans to include security upgrades, flood resilience, power resilience, control systems and reducing the number of critical asset single points of failure.</p> <p>The upgrade of the physical security of sites plans to continue. In AMP7, all WTW will meet the Water UK Security Standard. In AMP8, all WwTW are planned to be updated followed by water and wastewater pumping stations<sup>27</sup>. The investment in improving the physical resilience of critical WTW and WwTW will continue and there will also be significant investment in improving dam safety.</p> <p><b>The roll out of phase 2 and 3 of the cyber programme and continued investment in dam safety would lead to a score of 4.</b></p>	Level 3	Level 4	Level 3	Level 3.8

#### Areas to enhance:

The legacy equipment currently in use is in the process of being upgraded, in some cases increasing the potential cyber security risk. Plans to improve these systems are in place for AMP7, this will require extensive resource, both financial and skills and Welsh Water will need to ensure that this is available.

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Safeguarding and enhancing the environment



### Minimise environmental pollution

#### What leading looks like (Level 5):

The value of the environment and ecosystem services is integral to all investment decisions. A key aim of works is to reduce environmental pollution based on the capacity of the environment to process contaminants at a location by location scale. The impact that the company has on the environmental baseline is understood for the water, air, soil environments, as well as biodiversity and climate. Mitigations are in place to minimise this impact.

**Documents reviewed:** Welsh Water 2018a, Welsh Water 2018c, Welsh Water 2018d, Welsh Water 2017f

Level 1: Unaware of indicator

Level 2: Aware a response should be developed

Level 3: Response developed

Level 4: Response in progress

Level 5: Leading

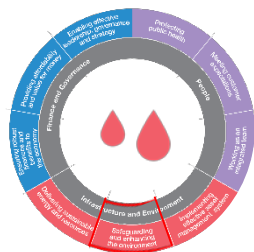
		Preliminary Industry benchmark			
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>In Welsh Water's operational area, only 37% of rivers meet WFD 'good' status (Welsh Water 2018g). However, of the measures required to move the remaining rivers to 'good' status, only 9% of them are actionable by Welsh Water. It is recognised that a full understanding of what actions will be required is dependent on the next NRW assessment, which is still pending. Welsh Water undertakes water quality modelling on some of these rivers in order to understand what investment is required to improve quality.</p> <p>As part of its efforts to contribute towards WFD requirements, Welsh Water has already:</p> <ul style="list-style-type: none"> <li>Completed comprehensive environmental studies in respect to all key water abstractions at sensitive sites and agreed new licences with regulators</li> <li>Implemented new fish screens at all sensitive sites</li> <li>Working with the third sector on a range of biodiversity improvements, such as spawning beds</li> <li>Coastal studies to confirm resilience of existing infrastructure</li> <li>'Stop the block' campaign, reducing pollution incidents</li> <li>Investment in upgrading the NRW and EA SAGIS modelling suite to determine where a tightening of wastewater discharge permits is required</li> <li>Completing CSO monitoring in AMP6.</li> </ul> <p>Welsh Water has implemented green infrastructure through their RainScope programme. This aims to reduce surface water runoff and prevent stormwater from entering sewers and causing CSO spills and pollution. Detailed hydraulic modelling was undertaken to ensure that the RainScaping installed was the most effective. Welsh Water's CSO monitoring programme involves implementing EDM at 100% of CSO in order to identify and manage those with a high spill frequency. Welsh Water is currently developing its modelling capabilities to predict the performance of sewers before they impact on the environment.</p>	<p>In Welsh Water 2050, one of the future programmes of work is focused on ensuring cleaner rivers and beaches - allowing them to meet WFD 'good' status. All actions attributable to Welsh Water are planned for completion in AMP7 or the first two years of AMP8, subject to a technical feasibility and disproportionate cost test.</p> <p>Investment is planned for AMP7 for WwTW and for frequent spilling CSOs based on EDM monitoring installed in AMP6<sup>26</sup>. Welsh Water has published a Biodiversity Plan which includes the commitment to improve discharges at 13 WwTW by 2020 (Welsh Water 2018f).</p> <p>Welsh Water plans to pilot an SMNR approach in three catchments during AMP7. This will build an understanding around the connections between its water and wastewater activities, ecosystems and well-being. The organisation plans to use a participatory approach, involving local communities and other stakeholders, including NRW.</p>				
		Level 3	Level 4	N.A.	N.A.





## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Safeguarding and enhancing the environment



### Institute integrated catchment management and sustainable stewardship of ecosystems

#### What leading looks like (Level 5):

Work to improve resilience of ecosystems and biodiversity is in progress.

Integrated catchment management is core to all work undertaken and viewed as a long-term strategy for ensuring the resources are there for future generations. Key components of the companies work in this field is close partnership working, as well as implementing ecosystem stewardship measures. Company goals are aligned with key partners. Approaches considered may include catchment management to improve raw water quality, and blue-green infrastructure to manage storm water and reduce flooding and pollution incidents.

**Documents reviewed:** Welsh Water 2018a, Welsh Water 2018c, Welsh Water 2018d, Welsh Water 2017f

Level 1: Unaware of indicator

Level 2: Aware a response should be developed

Level 3: Response developed

Level 4: Response in progress

Level 5: Leading

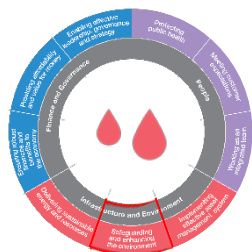
Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water has implemented 'WaterSource' a catchment management initiative. The key initiatives are:</p> <ul style="list-style-type: none"> <li>The weed wiper partnership, working with NRW and the farming industry to provide an alternative method of application of herbicides to reduce run off into watercourses (Welsh Water 2018c).</li> <li>PestSmart, working with NRW and farmers on new ways to deal with weeds and pests to reduce the amount of pesticides used (Welsh Water, 2018a).</li> <li>BBMC - working with the Brecon Beacons National Park, land owners, farmers and other stakeholders to promote new methods of land management (Welsh Water 2018c).</li> <li>Welsh Water has Biodiversity Champions. These are members of staff based on wastewater sites who implement environmental and biodiversity enhancements (Welsh Water, 2017f).</li> </ul> <p>Welsh Water held the WaterSource18 conference in March 2018 which focused on catchment science and land management. This gave an opportunity to learn from the team who manage the Catskills Watershed in New York (Welsh Water, 2018d).</p> <p>Welsh Water has implemented their RainScope programme which included retrofitting green infrastructure and working closely with local stakeholders, NRW and Welsh Government. Welsh Water was the first to use this technique in the UK and their work is recognised as UK best practice. This process included creating one of the largest and most detailed hydraulic models in the UK.</p> <p><b>Welsh Water score a level 4 because it is delivering catchment management and RainScope projects, as well as having a biodiversity plan in place.</b></p>	<p>In Welsh Water 2050, one of the future programmes of work is focused on catchment management, starting with high risk catchments. This also includes working with regulatory, national, local and third sector partners. A programme of work to roll out RainScaping further is also planned.</p> <p>This is to reach their aim of doubling water directed away from sewers over AMP7, and doubling it again in AMP8. This will be achieved in projects like the Cardiff City Centre flooding work. Significant investment in research and innovation is planned to improve environmental performance<sup>22</sup>. There are potential plans to roll out the best practice from BBMC to five more catchments in the future.</p> <p>Welsh Water plans to pilot an SMNR approach in three catchments during AMP7. This will build an understanding around the connections between its water and wastewater activities, ecosystems and well-being. The organisation plans to use a participatory approach, involving local communities and other stakeholders, including NRW.</p> <p><b>To score a level 5, biodiversity needs to be embedded throughout the business.</b></p>	<b>Level 4</b>	<b>Level 4</b>	<b>Level 3.2</b>	<b>Level 3.8</b>

**Areas to enhance:** Welsh Water currently focuses on catchment management pilots. There are good examples of catchment management, like the BBMC, which are planned for roll out in the future. Rolling out more integrated approaches, like the SMNR approach which considers both water and wastewater, could improve this further.

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Safeguarding and enhancing the environment



### Establish and use widespread environmental monitoring

#### What leading looks like (Level 5):

The environmental baseline is clearly understood, monitored and updated. Data is collected as relevant to the business and the environment it operates in, which may include marine and terrestrial ecology, air and water quality, groundwater levels, surface water flows, landscape effects, noise and vibration and the historic environment. Data is accurate, and where appropriate, accessible in real-time and linked to automated control systems that are adaptable and act to maintain good environmental conditions at all times. It should, where suitable, be linked to predictive models to inform long-term and short term strategies.

Preliminary  
Industry benchmark

Documents reviewed: Welsh Water 2018I, Welsh Water 2017I

Level 1: Unaware  
of indicator

Level 2: Aware a  
response should  
be developed

Level 3: Response  
developed

Level 4:  
Response in  
progress

Level 5:  
Leading

#### Welsh Water's performance now

Pockets of environmental monitoring have been observed, for example, PestSmart is an environmental monitoring programme (Welsh Water, 2017f). Welsh Water has undertaken a coastal surveying and modelling programme. This is one of the largest modelling programmes Welsh Water has undertaken and links with sewerage models. It was used as evidence for NRW that pollution events were not caused by Welsh Water which saved the company ten times the cost of the programme<sup>22</sup>. Welsh Water will have included EDM monitoring at 100% of their CSOs by the end of AMP6 to reduce pollution by identifying high spillers.

Welsh Water recognises that many of its operational sites offer opportunities for small scale measures to support nature. Welsh Water has implemented a trial network of Biodiversity Champions in its operational division, responsible for ensuring that biodiversity and environmental improvements are integrated into the work that it does and to ensure that baseline biodiversity data is collected. Welsh Water is undertaking chemical investigations and monitoring in CIP3, which includes trend monitoring for a diverse range of chemicals, pathway control and the use of a catchment management tool, Transitional and Coastal (TraC) Water, in the Severn Estuary. The organisation considers the future impact of climate change in the development of Sustainable Drainage Plans (SDPs)<sup>22</sup>.

Survey data is shared as part of the monthly Alliance Leadership Team meeting and reported as part of the 'Enabling' dashboard. There are environmental surveys undertaken which are linked to the environmental checklists (described in the indicator below). The data from these is currently not collated with the data collected by NRW on environmental river data.

**Welsh Water could collect more data across a wider set of environmental topics, so they score a level 3.**

#### Welsh Water's plans for AMP7 and beyond

The Smart Strategy includes some plans to improve raw water and catchment monitoring (Welsh Water 2018I) and there are plans for Welsh Water to supplement NRW's river data and analysis relating to water quality. Consideration of sharing large datasets with NRW on an open basis is being undertaken.

Welsh Water is planning to move towards using and analysing data to inform their day to day operations, as opposed to just using it.

There have been preliminary discussions with the Alliance and Welsh Water to implement a platform to capture all data sets that are regularly used as part of environmental surveying of sites. This could include public data e.g. Magic and corporate data systems, e.g. ecological surveys and pollution reports. This aims to make decision making easier. The Alliance expects to continue to collect large amounts of data over the next AMPs and a platform could make this data more accessible.

**There are no plans to collect data on additional topic areas, so the score remains a 3.**

#### Now

#### AMP7 & beyond

#### Now

#### AMP7 & beyond

Level  
3

Level  
3

N.A.

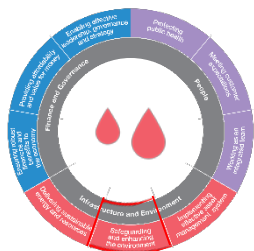
N.A.

**Areas to enhance:** Wider biodiversity assessments could be introduced, including assessing the presence of invasive species or European Protected Species for each site, with mitigation or improvement plans to enhance the biodiversity of the site, which is currently outside the remit of the Biodiversity Champions.

Collation of data to form an environmental baseline across Welsh Water's sites and provide a reference when undertaking new checklists, would enable a more reflective approach to baseline data collection. Welsh Water could consider additional Measures of Success to provide quantitative targets for building natural capital, restoring ecosystems and enhancing environmentally designated sites in line with their duty and current legislation and guidance.

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Safeguarding and enhancing the environment



### Consider environmental impacts in design, construction and operation

#### What leading looks like (Level 5):

Environmental constraints, enhancements and ecosystem services are considered at all stages of every project. Data on the impact to marine and terrestrial ecology, air and water quality, landscape effects, noise and vibration and the historic environment is key role to the decision making process. All investment considers future trends (including climate change and other hazards and risks) and include a number of review points where the environmental impacts and ecosystem services are re-assessed.

**Documents reviewed:** Welsh Water, 2017f, Welsh Water 2018l

Level 1: Unaware of indicator

Level 2: Aware a response should be developed

Level 3: Response developed

Level 4: Response in progress

Level 5: Leading

Preliminary  
Industry benchmark

#### Welsh Water's performance now

Welsh Water undertakes environmental surveys and modelling to support the design, construction and operation. These include:

- Innovative ecological and flow surveys of the Wye and Usk to support a review of abstraction licenses. These enabled the company to agree sustainable abstractions and compensation flows from impounding reservoirs to assist the fauna of the river and ensure that biodiversity is not impacted.
- Coastal surveying and modelling was used to show NRW that pollution events were not linked to Welsh Water's work. This was an extensive and innovative model which models outfall discharges and is shared with NRW so that there is one model for Wales.
- The discharge monitoring at 100% of CSOs by the end of AMP6 will help to reduce pollution as part of Welsh Water's service provision.
- Welsh Water has a carbon strategy to make sure a carbon focused approach to design is undertaken, including efficient equipment, reuse and offsite construction.
- Reducing construction waste by employing a Waste Strategy Manager, and a pilot is being undertaken to enable cross-project sharing of materials.
- Innovative aerial photographic technique surveys of Shad breeding downstream of the Brianne reservoir to ensure they are not affected by water discharges<sup>12</sup>.

Welsh Water shares lessons learnt with environmental stakeholders including:

- Shared SAGS river/land runoff modelling with the EA and NRW.
- Environmental surveys post pollution incidents, which are shared with the regulator and feed into reports such as SoNNaR.
- All new environmental data is gathered and provided by Welsh Water in a Geo-portal compatible format and provided to NRW who hold it on their public register<sup>12</sup>.

#### Welsh Water's plans for AMP7 and beyond

Welsh Water will continue to work with experts within its Alliance partnerships on Environmental Impact Assessments (EIA). The following is planned for improvement:

- Greater use of online, real-time and big data to undertake EIA. This will include the projects to improve raw water quality and catchment management in the Smart Plan (Welsh Water 2018l)
- Continue to implement the Biodiversity Action Plan which commits to review procedures to formalise how biodiversity gains are considered in design and maintenance of schemes (Welsh Water, 2017f).
- The AMP7 planning process is evidence led, linked to EDM data and based on extensive WFD riverine surveys. This covers 80 sections of river and highlights where pollution is not caused by Welsh Water.
- Work with Capital Delivery to share environmental surveys, and research projects, to inform thinking on scheme investments.
- Specific riverine biodiversity improvements including removal of migratory fish barriers.

Level 3

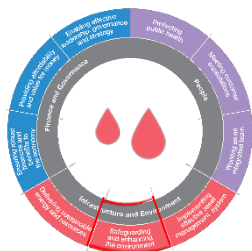
Level 4

N.A.

N.A.

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Safeguarding and enhancing the environment



Consider environmental impacts in design, construction and operation, continued.

Documents reviewed: Welsh Water, 2017f.

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Preliminary Industry benchmark			
		Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water's capital projects go through the Welsh Water internal process called the gateway process. At Gateway 3 and Gateway 4 projects are required to have an 'Environmental Checklist'. These cover similar topics to EIA such as: Air Quality, Noise &amp; Vibration, Agriculture and Soils, Landscape and Visual Impact, Transport, Cultural Heritage, Hydrology, Geology and Contaminated Land. Common ecological surveys undertaken include: Amphibian, bird and bat, dormice, otter, reptile and terrestrial invertebrate surveys<sup>12</sup>. It aims to ensure that environmental surveys applying to capital projects are identified in a timely manner, recorded, referenced and summarised. These are used to make effective and sustainable project decisions<sup>12</sup>. The environmental checklist can also include an enhancement section, but this is often not completed. This process is being updated to be 'smarter' so that information can be extracted and used on GIS style systems and shared with partners<sup>12</sup>. Every capital scheme will have an EIA screening and, where required, an EIA undertaken on it to meet planning requirements<sup>12</sup>.</p> <p>Where capital projects that include environmental enhancements are completed on Welsh Water owned land, a management plan is normally drawn up, demonstrating consideration of operation during design phases. For impounding reservoirs, environmental surveys are undertaken to facilitate their upkeep and avoid impacting sensitive species<sup>12</sup>.</p> <p>Welsh Water has signed an agreement with the four Local Environmental Record Centres (LERC), not-for-profit organisations which hold the main source of biodiversity data for design and construction projects. This allows real time access to environmental records for all Welsh Water schemes. This has become a key part of the project lifecycle and informs projects and the data collected by Welsh Water is fed back to them.</p> <p><b>Welsh Water scores a level 3, because they currently don't systematically look for areas to enhance through design and construction in addition to assessing potential negative environmental impacts.</b></p>	<p>The Tableau system is a step change in live data visibility and management and will continue to be developed in the coming AMPs.</p> <p>There are plans for increased carbon modelling in option selection, design and construction and carbon modelling will be added to the risk and value process.</p> <p><b>There are a number of areas where Welsh Water are improving the process for identifying environmental improvements, leading to a score of level 4.</b></p>	Level 3	Level 4	N.A.	N.A.

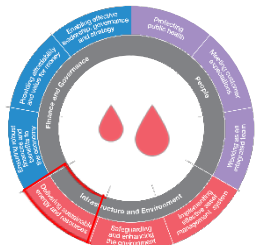
#### Areas to enhance:

The environmental considerations for new projects are often focused more on impacts than on enhancements and ecosystem services. This could be improved by formalising prior to entering Gateway 1 the process by which environmental data is gathered and reviewed. Discussions are being undertaken to improve how environmental data is held to make it more accessible and easy to use, if this system was implemented it could provide improvements in how environmental data is used. This could be especially useful when NRW and Welsh Government databases fail to hold suitable information, which could save Welsh Water time and costs.



## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Delivering sustainable energy and resources



### Assure sustainable abstraction and leakage

#### What leading looks like (Level 5):

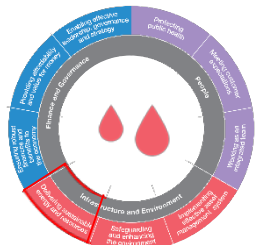
Ensuring sustainable abstraction is standard for all water sources. Environmental flow is understood and maintained in all river sources. Aquifer levels fluctuate within acceptable bounds and do not show a long-term downward trend. Leakage volumes are low and there are targets and processes to minimise leakages, outages and sewerage leakages further.

**Documents reviewed:** Welsh Water 2018c, Welsh Water, 2018l

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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		Preliminary Industry benchmark			
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water recognises the importance of meeting environmental obligations in taking water from the environment. The draft WRMP states an intention to comply with abstraction licenses and support the achievement of the WFD obligations and river basin management plan (RBMP) objectives. The deployable output modelling in the draft WRMP considers the abstraction license limits that constrain Welsh Water's supply capability.</p> <p>The draft WRMP outlines that Welsh Water's strategy for reducing leakage is based on the sustainable economic level of leakage (SELL) – the point at which the production of water is cheaper than the additional effort and cost needed to reduce leakage further. Welsh Water is on target to hit 169MI/d of leakage by the end of AMP6 – in compliance with Ofwat's requirement from PR14<sup>23</sup>. This would however only reduce leakage by 2% instead of the 15% Ofwat target<sup>23</sup>. This highlights the scale of the challenge that Welsh Water, in common with the industry at large, faces. The company has new leakage reporting software – WaterNet is in place. There is £6million additional funding for measurement techniques (measuring domestic leakage overnight, with new software calculating leakage more accurately, to gain a better understanding of demand and leakage)<sup>23</sup>.</p> <p>The organisation has trialled Project Cartref in 20 areas. It is a pilot for new 'Stopwatch Devices' for individual supply taps to determine likelihood of leakage on properties<sup>23</sup>. This reduces water wastage in domestic homes by identifying property-level leakage and offering free repairs and replacements where appropriate. It has also trialled the use of the 'AquaPea' for small leakage repairs.</p>	<p>Ofwat has an expectation that water companies will reduce the overall leakage from their water supply systems by 15% during the AMP7 period, which Welsh Water plans to meet.</p> <p>In terms of the distribution network, Welsh Water's future strategy will involve a greater degree of permanent monitoring of the network using emerging technologies, acoustic monitoring and radar technology<sup>23</sup>. The company plans to undertake new repair techniques such as AquaPea, a non-invasive repair technique<sup>23</sup>. The Smart Plan includes investment in leakage detection for AMP7 such as increased pressure logging, increased flow monitoring, and leakage acoustic logging (Welsh Water, 2018l).</p> <p>To continue to address customer-side leakage, Project Cartref pilot will continue to use new technology to survey properties in areas with apparent high leakage, and to follow up points of interest with a repair service. Based on the results of the pilot, this initiative will be scaled up to potentially reach 20% of properties. It will continue to deploy the AquaPea if this is shown to add value.</p> <p>The organisation is also planning to implement a new economic model for leakage that encompasses a wider range of innovative economic solutions for leakage reduction.</p>	Level 3	Level 4	N.A	N.A.

**Documents reviewed:** Welsh Water 2018c, Welsh Water, 2018l



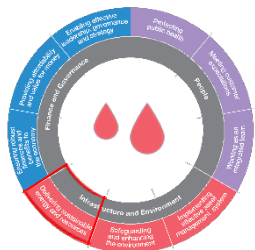
## Assure sustainable abstraction and leakage, continued

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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				Preliminary Industry benchmark	
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water has also run a programme called 'Wrap up Wales' in response to Storm Emma, which involved education to ensure that when buildings were left empty, water was turned off and drained. The organisation has also piloted satellite and drone surveys, which it claims have shown positive initial results.</p> <p>Welsh Water is also involved in industry-wide projects through UKWIR and the Water Research Centre (WRc), including assessments of fast logging, various metering studies, and methods of estimating unmeasured household consumption.</p> <p><b>Welsh Water scores a level 3 because there is still work to do to reduce leakage, but there is a plan in place to achieve this.</b></p>	<p>Welsh Water will continue to trial drone and satellite surveys to better identify and target leakage in trunk mains. It will also introduce permanent acoustic monitoring on all of its trunk mains.</p> <p>Welsh Water is considering undertaking aerial surveys, electronic listening sticks and accompanying app, infrared and embedding sensors in new pipes. Research is being undertaken looking into dynamic water supply networks.</p> <p><b>Welsh Water scores a level 4 because it is expected to deliver its plan.</b></p>	Level 3	Level 4	N.A	N.A.
<p><b>Areas to enhance:</b></p> <p>Work to improve leakage monitoring will be developed though implementing pilots, which will need to be rolled out across the network to create significant savings. There is a wider demand management strategy in development which incorporates leakage and encompasses a wider range of innovative economic solutions for leakage reduction.</p>					

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Delivering sustainable energy and resources



### Ensure sustainable resource use and energy provision

#### What leading looks like (Level 5):

The impact of energy and resource use is well understood. Plans are in progress to significantly reduce demand for all resources, both by customers and within the supply network, now and long term. Control and security of supply is achieved partly through company owned renewable energy sources, energy storage and effective use of resources (e.g. sludge). A circular economy approach is taken to all resource use. Where appropriate energy produced is sold to others.

Documents reviewed: Welsh Water, 2018I

Level 1: Unaware of indicator

Level 2: Aware a response should be developed

Level 3: Response developed

Level 4: Response in progress

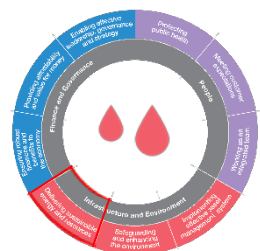
Level 5: Leading

Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water has an energy strategy that has delivered significant progress over AMP5 and AMP6. Control and security of supply has increased considerably from 2% of energy self generated in 2009/10 to 21% now and a forecast 30% by 2020 when current investments are fully online. The company now owns and operates 60 renewable generation sites ranging from 15kW solar/hydro plants to 4.5MW CHP, 4.6MW hydro, and 2.5MW solar plants. These plants supply electricity for use both via private wire and supplying to itself via grid using an integrated export and supply contract which delivers 100% renewable energy to meet the balance of the company's requirements, and reduce it's carbon footprint. Welsh Water also operates the first biomethane injection site in Wales, part of its innovative Five Fords Waste Water Energy Park.</p> <p>Welsh Water has formed its Water Network Alliance, which combines their leakage reduction, burst main repairs, and lead replacement programmes. This is to provide economies of scale, reduce programme risk and allow better co-ordination. This will help to ensure affordability for customers.</p> <p>In line with the whole industry, energy consumption has remained fairly static over recent years, with gains through efficiency initiatives, offset by the impact from £3billion of capital investment across two AMPs into new sites and improved service as well as from an increase in the number of sites from 3,600 to 4,200 (mainly ex-private sewage pumping stations).</p>	<p>Welsh Water has a goal to be energy neutral by 2050, and the steps to reach this goal are mapped out in an adaptable long term strategy. One milestone will be reached in 2021 when they expect to be gas positive, i.e. generating more gas than they use.</p> <p>There is a £27million investment planned for capital energy projects in AMP7. In AMP7, Welsh Water plans to focus on:</p> <ul style="list-style-type: none"> <li>Energy efficiency: with a focus on smaller schemes linking to pumps, control, lights and aeration as well as some network control projects</li> <li>Renewable energy generation: increasing output by implementing new sludge, solar and wind projects</li> <li>Demand side management and storage: optimising when energy is used to save costs</li> <li>Other innovative projects, where they arise and bring value.</li> </ul> <p>The smart strategy includes investment in AMP7 to consider real time energy demand and generation management pilots including moving towards managing its generation assets as a single "virtual power-plant". Consumption is predicted to reduce slowly through AMP7 as the company's wider capital programme becomes more focused on delivering energy neutral or energy reducing solutions whilst the ongoing investment into energy efficiency projects continues to reduce the energy use of existing sites. The energy team needs to continue to work closely with the capital team to ensure the implementation of energy reduction programmes, and work with the operational staff to run the assets more efficiently.</p>				
		Level 4	Level 4	N.A	N.A.

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Delivering sustainable energy and resources



### Ensure sustainable resource use and energy provision, continued

Documents reviewed: Welsh Water, 2018I

Level 1: Unaware of indicator

Level 2: Aware a response should be developed

Level 3: Response developed

Level 4: Response in progress

Level 5: Leading

Preliminary  
Industry benchmark

#### Welsh Water's performance now

Investment into energy efficiency has included a comprehensive lighting replacement programmes and blower upgrades backed by a behavioural energy efficiency programme which reached over 500 colleagues over the last year. It is, however, only just beginning its first wide area network optimisation project (due to deliver optimisation of its South East Wales Water network) in 2020.

Welsh Water has an energy team that manages and optimises the generation assets and works both with operational teams delivering day-to-day service and with capital teams to reduce energy usage in new sites though include energy efficient technology, e.g. consideration of technology type. Energy consumption and generation) is well understood and communicated to those who can impact its use through a range of monthly, weekly and daily reports. Most meters have the ability to produce half hourly data although submetering (i.e. metering within a site) is limited to a small number of larger sites<sup>14</sup>.

**Welsh Water scores a level 4 because they have made significant progress towards roll out of renewable energy generation.**

#### Welsh Water's plans for AMP7 and beyond

Welsh Water will consider how nature-based solutions, such as reed beds and RainScape features, can reduce the energy required for water treatment and conveyance in future schemes.

Welsh Water expects its Water Network Alliance to be fully operational by the beginning of AMP7, providing £10m of efficiency savings per year. It also expects the new Alliance contract to begin delivering efficiencies in the capital delivery programme.

**Welsh Water needs to give further consideration to the circular economy and energy efficiency to become leading in this area., and therefore retains a level 4.**

#### Now

Level 4

#### AMP7 & beyond

Level 4

#### Now

N.A

#### AMP7 & beyond

N.A.

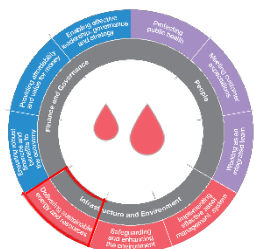
#### Areas to enhance:

Welsh Water has implemented significant renewable energy generation projects. Our evidence suggests that on energy efficiency measures and projects the focus has been more on the larger sites and some areas, such as network automation and control, have not yet seen significant progress. Whilst there has been extensive communication with operational colleagues, this has not extended to formal training for a recognised qualification in energy efficiency awareness such as the Energy Managers Association's LEC stage 1 training. Welsh Water is continuing to invest in and implement energy generation and efficiency projects in the coming AMP. This could be enhanced by wider roll out of any successful pilots and considering more formal methods to ensure that all new designs, maintenance and decision making considers energy efficiency. Currently there is no formal energy qualification for OT colleagues and this could be considered. Finally, it could also further build on its work with Network Operators on resilience as the increase in intermittent generation (wind and solar) leads to more "brown outs".



## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Delivering sustainable energy and resources



### Develop a robust and flexible supply chain

#### What leading looks like (Level 5):

The impact of supply chains on operations is considered for both physical and skills resources. Supply chains are diverse, flexible and competitive to deliver the best outcomes for their customers. There are suitable internal processes to regularly review and adjust the resilience of supply chains. Investment is smoothed to avoid negative boom-bust impacts (related to AMP cycles) on suppliers and local SMEs are supported where appropriate.

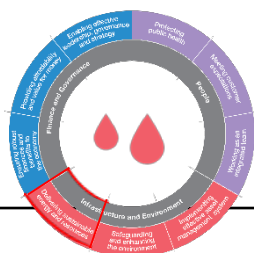
Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water has a risk and value assessment that applies to the whole supply chain. Contracts with key suppliers range from platinum to gold rating (e.g. chemicals). There are KPIs for alternative sources of supply and resilience, to silver and bronze suppliers, where other suppliers are available. Welsh Water has different levels of engagement and procurement specialists aligned to key contracts, e.g. those 'gold rated' – to ensure a category management approach is applied to underpin 'good' supplier relationships and to enable response to any issues in 'markets'. A contemporary example is the recent shortage of carbon dioxide gas – whereby our arrangements with suppliers meant we did not face any uncertainty in terms of continuity of supply during the recent 'shortage' in the UK<sup>36</sup>. The Capital Alliance is trialling a closer relationship with 25 key gold suppliers, sharing the future work plan for the next 18 months to two years<sup>12</sup>.</p> <p>Welsh Water guides the separate procurement team for the Capital Alliance. It encouraged Skanska to bring global expertise to lead this procurement. They are currently working to understand the regional variations in supplier capacity. There are some areas with limited capacity of skilled labour, due to demand from competing infrastructure projects (e.g. Hinkley and HS2). The Alliance has visibility and is therefore planning for procurement to the end of AMP6, with some forward planning for AMP7. The shared systems and working structure give the Alliance a better integrated view of future demand, as well as a degree of protection and flexibility in contracts. Some consideration has been given to water trading but there are no plans in place<sup>12</sup>. The experience of the Alliance partners has led to good practice, such as build off-site.</p> <p>Welsh Water has sought early engagement with the existing Capital Alliance Partners to enact the ten year (5 + 5) contract extension process with them, due to good performance in safety, quality and cost. It will offset the risk of reducing capacity in the market and has 'stressed tested' the Partners in terms of 'Carillion' type trading risks. Welsh Water operates a joint HR Director Forum with the Capital Alliance Partners to help mitigate key risks such as, resource availability and skills and competence. There is clear alignment in terms of ensuring appropriate apprentice and graduate schemes, use of innovative programmes – such as 'Network75' to train new engineers. As well as review of terms and conditions across the Alliance to ensure competitive 'T&amp;C's to attract and retain people.</p>	<p>Ready for the start of AMP7, Welsh Water plans to roll out close working relationships with suppliers across the supply chain. This will include sorting all suppliers into platinum to bronze ratings and sharing work plans for two years. This will mean that Welsh Water has further visibility of the more specialist parts of its supply chain, and can align this to longer-term planning.</p> <p>Following prudent and early agreement to secure extension of the Capital Alliance Contracts, the Alliance Partners are being engaged in development of the planning process for AMP7 investment schemes. To reduce risk to the supply, the programme is being front-loaded to give certainty of workload. In addition, by November 2018, the Alliance and Welsh Waters' Senior Capital team will have developed an efficiency programme to deliver targeted cost reductions.</p> <p>In addition, the AMP7 programme has already started to be made visible to the Alliance Partners, enabling not only effective resource planning, but also providing the ability to assist forecasting for procurement of equipment, services and suppliers. At this stage we are confident these actions will result in an 'easy' transition to the AMP7 investment programme<sup>36</sup>.</p>	Level 3	Level 4	Level 3.1	Level 3.4

## 5. Resilience assessment for Welsh Water: Infrastructure and Environment

### Delivering sustainable energy and resources



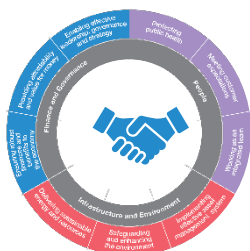
### Develop a robust and flexible supply chain, continued

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>In order to deliver the change required within the capital delivery alliance, a transformation lead has been appointed.</p> <p>There is a pilot project that has just started to look to co-locate a Welsh Water team with its supply chain delivering £35m of phosphate removal schemes.</p> <p>There are also updates to the Water Network Alliance. This is using an innovative contract process to combine current contracts, improve efficiencies of scale and improve the reliability of finding contractors to work in isolated and rural areas on reactive work. This signs the contractor up to do both planned and reactive maintenance and is a pain-gain contract to drive efficiency<sup>35</sup>.</p> <p>Some teams have identified skills as an area where the current supply chain is lacking robustness. For example the Dam Safety team is challenged by the remoteness of sites to find the right skilled workforce leading to no skill redundancy in the supply chain. This opens the company up to Health and Safety risks due to the lack of correct personnel on site if any of the workforce moves on<sup>31</sup>.</p> <p>Local procurement from Welsh suppliers is encouraged but not favoured by procurement arrangements. Welsh Water is working with the Sustainability School, construction companies are already signed up and local companies and smaller SMEs are also being encouraged to do so<sup>21</sup>. Welsh Water is also working with Supply Chain Wales to ensure that training and development is in line with business needs<sup>12</sup>, and with the Princes Trust to sponsor 'getting into construction training'<sup>12</sup>.</p> <p>A senior operational manager has been assigned to liaise with Western Power Distribution (our major regional electricity distributor) to identify where our main water treatment assets are experiencing and are most susceptible to 'brown out' risk. This follows a programme of updating respective assets in terms of 'UPS' protection. We intend to extend this approach to Scottish Power in North Wales, however the risk is lower here due to existing embedded generation<sup>36</sup>.</p> <p><b>Welsh Water scores a level 3 because it has some activity to deliver a robust and flexible supply chain, and a clear plan in place to deliver a more integrated and adaptive supply chain for AMP7, aligned to future business needs and risks.</b></p>	<p>Future changes also include closer relationships with their Alliance Partners bringing them into projects at an earlier stage<sup>12</sup>.</p> <p>Innovation in the supply chain will continue to be promoted. The Innovation Hub will continue to bring in new suppliers and it will encourage these new suppliers to co-locate for the day to promote discussions. Suppliers will be engaged early and there will be a collaborative approach to solving Welsh Water challenges, through process like hackathons and design sprints.</p> <p>New gateway processes are planned such as involving the supply chain at early project stages (gateway 2 and 3) and creating a pre-gateway 4 process which includes undertaking project rehearsals, using CAD modeling, to ensure that project phasing is effective.</p> <p><b>There are plans in place within the Capital Delivery Alliance to look further ahead. Closer relationships will be developed with suppliers across the broader supply chain for the whole of Welsh Water, therefore a level 4 is achieved.</b></p>	Level 3	Level 4	Level 3.2	Level 3.4

**Areas to enhance:** Welsh Water is improving how closely it works with the supply chain in the future. The company could enhance this by sharing even longer term resource and skills requirements with their supply chain. This would ensure that there is an assessment of criticality of supply chain elements looking further into the future and at the supply chain as a network rather than as a simple chain.



## 6. Resilience assessment for Welsh Water: Finance and governance

### Key findings

#### Areas of strengths

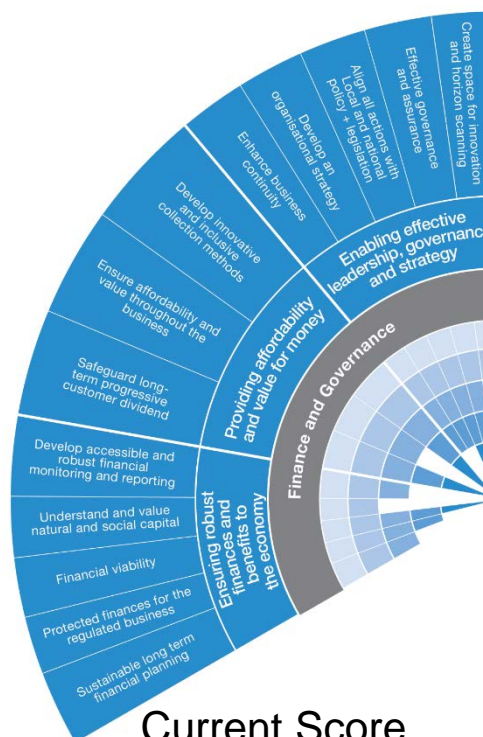
- Not-for-profit, dividend business model enables the company to think long term and re-invest or distribute profits to enable less well-off customers to pay lower bills. For example, following the identification of a surplus in 2016, Welsh Water engaged with customers to inform investment in additional storage, flood protection, a new visitor centre and an increased spend on social tariffs.
- One of the leading water companies for Financial Viability with the highest credit rating (Moody's 'A2' Stable) and lowest gearing ratio in the water sector. This helps it meet the Ofwat 2018d combined downside scenario (10% higher Totex per year, annual Outcome Delivery Incentive (ODI) penalty equivalent to a 1.5% of return on retained earnings (RORE), and a financial penalty of 1% of revenue in one year), although this combination of events could reduce the amount money available to keep social tariffs low.
- Welsh Water's Licence and bondholder Common Terms Agreement adds considerable additional requirements to make sure the company does not overextend itself, e.g. the obligation to have at least 12 months of liquidity.
- Sustainable long-term organisational strategy (Welsh Water 2050), looking forward to the next 30 years. This strategy is well aligned with current policy, legislation and guidance including the Well-being for Future Generations Act (Wales) (WFGA). The investment strategy for AMP7 is also well aligned with the 2050 strategy.
- Good innovation processes to capture new ideas, which allow flexibility and show a willingness to adopt new thinking and methods of working.

#### Areas to enhance

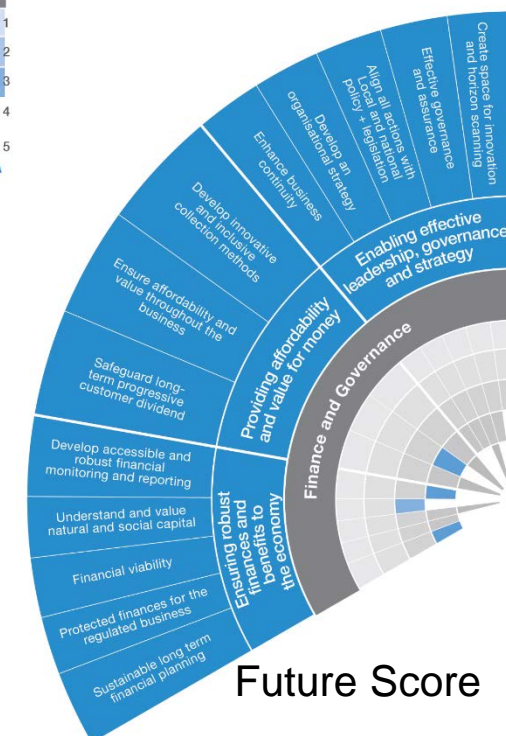
- Welsh Water 2050 has high-level expenditure plans until 2050. Further detailed planning for AMP8 and AMP9 would be valuable, ensuring that planned maintenance and refurbishment of assets is sufficient to avoid backlogs building up and overall network asset health deteriorating.
- Welsh Water 2050 represents a leading approach to long-term strategy development and more could be done to truly embed this within the business.
- Opportunities to further embed innovation by increasing people and culture change to support processes to enable fail fast approaches. Additionally, better connections to business as usual could increase the flexibility to innovate.
- Further opportunities for developing accounting of natural and social capital could influence project-level decision-making to make new assets and systems become more resilient.
- Building on the Rhondda Fach Water Resilient Community pilot, to support more customers to access the social tariff, could enable Welsh Water to become leading in this area.

Level 5 Leading
Level 4 Response in progress
Level 3 Response developed
Level 2 Aware a response should be developed
Level 1 Unaware of indicator

**Interviews:** Aled Daniel<sup>1</sup>, Clive Hardy<sup>5</sup>, Brendan McAndrew<sup>6</sup>, Dale Walker<sup>7</sup>, Dave Collins<sup>9</sup>, Linda Williams<sup>11</sup>, Martin Hennessey<sup>12</sup>, Nicola Williams<sup>15</sup>, Peter Bridgewater<sup>17</sup>, Samantha James<sup>19</sup>, Sharon Ellwood<sup>20</sup>, Tony Harrington<sup>22</sup>, Alun Shurmer<sup>24</sup>, Philippa Pearson<sup>25</sup>, Chris Jones<sup>28</sup>, Ian Christie<sup>29</sup>, Steve Wilson<sup>30</sup>, Nick Parkin<sup>31</sup>, Amanda Soady<sup>32</sup>, Peter Perry<sup>36</sup>



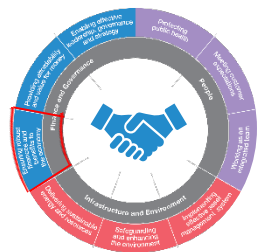
Current Score



Future Score

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Ensuring robust finances and benefits to the economy



### Sustainable long-term financial planning

#### What leading looks like (Level 5):

The company is looking forward 25+ years, with investment and expenditure plans linked to the strategic direction of the company. These are regularly reviewed and tested. Base operating and maintenance expenditure together with any additional enhancement or replacement expenditure to meet customer and regulatory requirements have been identified on a year-by-year basis in the short to medium term and AMP by AMP basis for the longer term. The company has an excellent understanding of the current and future predicted condition and performance of all its assets. All new investment is future proofed.

Documents reviewed: Ofwat 2018a, Ofwat 2018c, Welsh Water 2018a, Welsh Water 2018c, Welsh Water 2018l

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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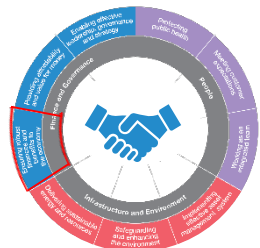
		Preliminary Industry benchmark			
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>It is understood that Welsh Water has data on the condition of critical water and wastewater assets which serve 80% of their customers<sup>6</sup>. The company also annually reviews the resilience of its critical assets.</p> <p>Welsh Water is actively developing its 2050 strategy. Already there is a comprehensive strategy report entitled Welsh Water 2050 (Welsh Water, 2018a) and a draft WRMP 2019 (Welsh Water, 2018c). Whilst these two documents have detailed area-by-area estimates of future population growth, leakage levels and the impacts of climate change, it is understood that only high-level costings have been estimated at this point. For example, although they have detail for AMP7, and some detail for AMP8, for AMP9 the estimates are at a much less granular level. Over time, these estimates will need to be improved to avoid any step changes in AMP-by-AMP Totex requests.</p> <p>In 2017/18, Welsh Water invested c.£430million in new assets and asset replacement against an estimated cost to replace all assets of c.£23billion (Glas Cymru Holdings Cyfyngedig, 2018). These are moving from being reactive to more proactive.</p> <p><b>Our evidence suggests that Welsh Water knows the condition of its critical assets and many of their other assets, but there are still some gaps in this understanding, which might impact on Welsh Water's ability to accurately predict future expenditure, thus scoring a level 3.</b></p>	<p>Welsh Water is increasing its knowledge of its asset base and compared to many other water companies is more advanced in long-term planning. Its AMP7 Smart Strategy has a focus on monitoring and management e.g. leakage, automating networks through the mothership strategy, and water network control (Welsh Water, 2018l). In AMP7, Welsh Water is also going to prepare a DWMP for the wastewater network.</p> <p><b>Welsh Water has plans to improve its asset knowledge, leading to more accurate investment projections into the future, scoring a level 4.</b></p>	Level 3	Level 4	Level 2.6	Level 3.3
<p><b>Areas to enhance:</b> As well as completing an assessment of the condition and criticality of all its assets and finalising the DWMP, Welsh Water could further progress Welsh Water 2050, the draft WRMP and the DWMP into more robust nearer-term detailed AMP8 and AMP9 expenditure plans ensuring that overall asset health does not deteriorate.</p>					



## 6. Resilience assessment for Welsh Water: Finance and Governance

### Ensuring robust finances and benefits to the economy

**Documents reviewed:** Glas Cymru Holdings Cyfyngedig 2018, Glas Cymru Holdings Cyfyngedig 2017, Ofwat, 2017d, Deutsche Trustee Company, 2016.



### Protect finances for the regulated business

#### What leading looks like (Level 5):

The company has appropriate measures for ring fencing finances for regulated activities to protect the interests of customers. Where the company has non-regulated activities, these are managed appropriately so they do not risk the financing of regulated activities. The company maintains flexibility to finance regulated company activities in the event of shocks to the group finances, evidenced by results from stress tests, spare cash reserves, liquidity, etc.

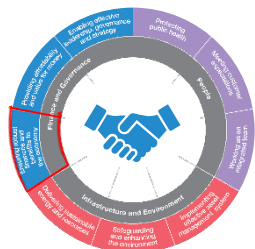
Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Preliminary Industry benchmark			
		Now	AMP7 & beyond	Now	AMP7 & beyond
<p>From formation to 2016, all the company's activities were regulated. Since 2016, the company has been able to offer unregulated services (Glas Cymru Holdings Cyfyngedig, 2017). Two new companies have been formed:</p> <ul style="list-style-type: none"> <li>Cambrian Utilities Limited was set up to allow Glas to operate in the competitive non-household retail market in England. This has since been put on hold after a recognition of the costs involved.</li> <li>Welsh Water Infrastructure Ltd. was set up to allow Glas to make investments in activities closely associated with the water and waste sector that add value. The only investment to date has been the acquisition of an anaerobic digestion plant on the site of Welsh Water's Cardiff WwTW which generates electricity for the works. Currently less than £20m has been invested, and there are no plans for further material (&gt;£1m) investments.</li> </ul> <p>The 2015 Whole Business Securitisation Common Terms Agreement was amended with a new clause requiring new business to be <i>"limited predominantly to the utility and infrastructure sectors in the United Kingdom"</i> and capping investments at £100million which represents less than 2% of Regulatory Capital Value (RCV) (Deutsche Trustee Company, 2016).</p> <p><b>A score of 4 is awarded.</b> Arup has made the decision that across all the People, Infrastructure &amp; Environment, and Finance &amp; Governance headings (which are broadly equivalent to the Organisational, Governance and Financial resilience groupings Arup has used when evaluating other water companies) a score of 5 (Leading) can only be awarded to two or three water companies as a maximum. As most UK water companies now have very few (&lt;5% of turnover) non-regulated activities (or have robust systems and structures to avoid the risk of cross default), from the evidence we have seen there is insufficient differentiation for any to score a 5. Therefore, many companies are awarded a 4 against this sub-heading, with Welsh Water's score of 4 not being a reflection of any weaknesses in protecting its regulated business finances.</p>	<p><b>As we do not envisage other water companies significantly increasing their exposure to non-regulated activities in AMP7 and beyond, a score of 4 is awarded.</b></p>	Level 4	Level 4	Level 3.8	Level 3.8

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Ensuring robust finances and benefits to the economy

**Documents reviewed:** Dŵr Cymru Cyfyngedig 2018, Glas Cymru Holdings Cyfyngedig 2018, Ofwat 2017a, Ofwat 2017b, Ofwat 2017c, Ofwat 2017d, Ofwat 2018a, Ofwat 2018b, Ofwat 2018c, Ofwat 2018d



### Financial Viability

#### What leading looks like (Level 5):

The Directors review the long-term viability of the company as an extension of their business planning process, and by their actions retain a strong investment grade rating for the company (ideally Standard & Poor (S&P) equivalent  $\geq$  'BBB+' Stable Outlook). To do this the company:

- has financial systems to accurately project planned Opex, Maintenance and Capex expenditure in each AMP
- has access to sufficient additional liquidity (cash or access to cash) in the event of unforeseen events or failures
- publicly reports in accounts look-forward rolling financial viability statements for at least five years based on long-term scanning spanning at least two AMPs, regularly stress testing the company to meaningful shocks (e.g. impact of change in inflation, major wastewater event, terrorism/ cybersecurity incident, failure to accurately predict Opex costs and future Capex costs, etc.), including the Ofwat July 2018 stress tests
- to accommodate stress tests and scenario analysis (e.g. the Ofwat July 2018 stress tests) has determined appropriate gearing levels and appropriate use of instruments such as inflation-linked debt
- has appropriate insurance policies and cover.

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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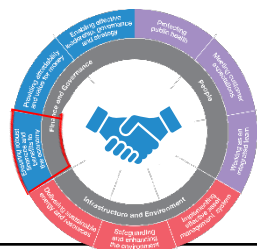
Preliminary  
Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>As of July 2018, the company had the highest Credit Rating of all water companies, with Moody's rating it at 'A2' Stable, which would correspond to an S&amp;P equivalent of an 'A'. Addressing each of the points in turn:</p> <ul style="list-style-type: none"> <li>• Having Ofwat-agreed Totex allowances for each AMP, Welsh Water has detailed Opex and Capex forecasts for AMP6 and AMP7. It has high level plans to the end of AMP9 (2035) and AMP8 plans are now being refined further.</li> <li>• Under the Whole Business Securitisation, the Group is required to have liquidity (cash and access to committed finance) for at least 12 months, plus a £135m Special Liquidity Facility to meet interest costs for the next 18 months. As at March 2018, the company had three years' of liquidity.</li> <li>• Whilst Welsh Water does not make a financial viability assessment of their regulated business (Dŵr Cymru Cyfyngedig), in the 2017/18 accounts for their holding company, Glas Cymru Holdings Cyfyngedig, they have increased the long-term viability assessment from a rolling five years to 12 years (the end of AMP8) which is believed to be the longest viability statement of any water company. Welsh Water runs stress tests and scenario analysis to check the solvency of the company. For example, each year it runs stress tests in isolation and in combination on 13 risks (allocating impacts on each between £5million and £50million) and on high inflation rates. Even with all downside sensitivities its net debt/RCV ratio is 72%, still significantly below its lockup net debt/RCV value of 85%<sup>17</sup>. It has also run the July 2018 Ofwat downside scenario of a 10% overspend on Totex per annum, an Outcome Delivery Incentive (ODI) penalty equivalent to 1.5% of return on retained earnings (RORE) in each year, and a financial penalty of 1% of revenue in one year and these can be managed. One impact of downside scenarios could be that the levels of social tariffs will have to be adjusted.</li> <li>• Welsh Water has the lowest gearing ratio of all water companies (57% in 2017/18) and all its debt is inflation-linked or fixed, giving stability of interest cost relative to income and asset base.</li> <li>• The company also has in place a robust insurance policy strategy to further reduce downside risks.</li> </ul> <p><b>Therefore, it is one of the few water companies to be awarded 5 (Leading).</b></p>	<p><b>Welsh Water has indicated it will continue to report a rolling 12-year Long-Term Viability Statement. During AMP7 it will slowly reduce the gearing rate further, creating even greater headroom to deal with unforeseen shocks. Therefore, the score of level 5 (Leading) is retained.</b></p>			Level 5	Level 5
				Level 3.8	Level 4.1

**Areas to enhance:** Welsh Water needs to continue preparing in more detail its AMP8 and AMP9 Capex and Opex costs and possible financing needs. It could also test more 'severe but reasonable' events with impacts much greater than £50million, e.g. major terrorist attack, dam burst, rolling electrical brownouts, or a prolonged period of Storm Emma (1<sup>st</sup> – 3<sup>rd</sup> March 2018).

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Ensuring robust finances and benefits to the economy



### Understand and value natural and social capital

#### What leading looks like (Level 5):

The natural environment valued as a vital resource and is protected and used across the network. Wider benefits in terms of ecosystem services is recognised. Value is given to social and environmental services and benefits, which is integrated into decision making throughout the lifecycles of a project and supported by senior leadership.

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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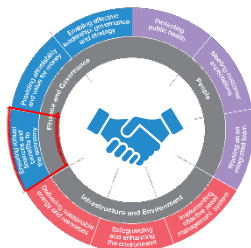
		Preliminary Industry benchmark			
Welsh Water's performance now		Welsh Water's plans for AMP7 and beyond		Now	AMP7 & beyond
<p>Meeting legislation or regulatory requirements is the focus of environmental consideration. Welsh Water aims to involve environmental and sustainability professionals early on in the process. The Swansea Bay Wind Turbine was the first UK project to be award the 'Deep Green' status by Skanska for enhancing biodiversity. The value of ecosystems is considered in projects, particularly those linked to RainScape, for example in Greener Grangetown. Within cost models some consideration is given to the environment related to spills and pollution impact<sup>20</sup>. The current risk and value whole life cost approach can identify the RainScape is the best solution, however it does not capture wider benefits. For example Cambrian RainScape, removed 125,000m<sup>3</sup> of surface water with savings on both cost and carbon as well as significant partnership working<sup>12</sup>. Welsh Water recognises that for some projects the lack of environment and social capital in the risk and value process has been identified as an issue for valuing natural solutions, therefore plans to explore how this could be integrated.</p> <p>Projects such as the Llanfoist WwTW have green infrastructure proposals which are submitted with the planning application to improve biodiversity of the site, links with local schools, and the opening of a footpath to the general public<sup>12</sup>. Welsh Water has commissioned a Natural Capital assessment of the Llanfoist scheme to show the wider ecosystem service benefits. The Llanelli strategy undertook its own multi-criteria analysis which had significant weighting on social and environmental factors and was the foundation of the £97million project. The Alliance also has a carbon strategy to be carbon focused in the approach to solutions.</p> <p><b>Welsh Water has undertaken some work on 'Natural and Social Capital', which shows it is not aligned to the current regulatory framework, scoring a level 2.</b> This would need to be changed to allow Welsh Water to value natural and social capital effectively.</p>		<p>Welsh Water undertakes RainScape because they believe it is the right thing to do. Post completion carbon calculations for projects like Llanelli and Gowerton, have shown significant carbon benefits.</p> <p>There are plans to roll out Natural Capital assessments further in AMP7 and 'Environmental Checklists' are being updated to include natural capital<sup>12</sup>. The Risk and Value process is under review to incorporate and value wider benefits in their cost modelling, including social and economic benefits<sup>20</sup>. Welsh Water has been speaking to Welsh Government to discuss this.</p> <p>They are trying to learn from other places with success with this, like floodable spaces in Copenhagen<sup>20</sup>. Welsh Water plans to align with the requirements of the Environment (Wales) Act as a joined up approach to deliver better environmental outcomes. Alignment with the Wellbeing of Future Generations Act and the ability to support the delivery of multiple goals, contributing to the success of Wales.</p> <p><b>Welsh Water plans to introduce natural capital assessment for some pilot projects, but not across the board, continuing to score level 3.</b></p>		Level 2	Level 3
				N.A.	N.A.

**Areas to enhance:** Welsh Water has begun to consider the environmental and social impact of the service they provide but this does not influence all the work that they do. A comprehensive baseline at regional, catchment and asset scales would help make improvements to this. There is an opportunity to further deliver value by developing natural and social capital accounting approaches and embedding this within decision-making, if the regulatory framework clashes are solved.

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Ensuring robust finances and benefits to the economy

**Documents reviewed:** Glas Cymru Holdings Cyfyngedig 2018, Glas Cymru Holdings Cyfyngedig 2017, Ofwat, 2017d



### Develop accessible and robust monitoring and reporting for financial performance

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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#### What leading looks like (Level 5):

The company has appropriate measures to monitor and confirm the company's long-term viability, which goes beyond AMP cycles to track trends in maintenance programmes, climate change and demographic changes, etc. These measures are supplemented by regular sensitivity tests and scenario testing. Such information is recorded and reported routinely at Board level, with clear criteria for when material divergences from expected plans need to be discussed and actioned.

Transparency and inclusiveness is ensured through public reporting on financial and annual performance (via the annual reports and APRs). This uses customer focused language, (e.g. use of historical taxable losses to boost profits). Bills are easy to understand with visuals showing where customers water bills go, and how it minimises leakages, outages and sewerage leakages. Corporate, financing and tax structures are transparent and easy to understand.

Preliminary  
Industry benchmark

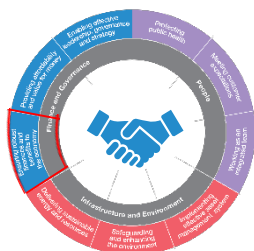
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p><b>Internal processes</b></p> <p>A new financial system was installed in October 2017, and offers improved business planning, budgeting and reporting<sup>17</sup>. Plans are now being made to develop financial reporting "dashboards" at a more granular and self-service level.</p> <p>Welsh Water performs stress and scenario tests every year on the potential impacts of key risks on its finances. These are presented and discussed at the Audit Committee and Board and then reported in the Annual Report and Accounts. The stress test risks are discussed each month at the Executive meeting (DCE), and at the Board each quarter, with new stress tests run if necessary.</p> <p>As Welsh Water has a Whole Business Securitisation Structure it has many positive and negative financial covenants for what it must and cannot do, and has to report quarterly to its bond holders with three-year look forward assessments. This increases scrutiny of its monitoring and reporting practices.</p> <p>In awarding the company a 'targeted' status, Ofwat 2017d reports against the Risk &amp; Compliance Statement that the "company has sufficient processes and internal systems of control to meet those obligations."</p> <p><b>External presentation</b></p> <p>Welsh Water is repatriating the Cayman Finance Company in late 2018, and is planning to issue a Security Trustee Intercreditor Deed amendment proposal to lenders in October 2018 to gain full approval to carry this out<sup>17</sup>. The company is using the experiences of other water companies that are also repatriating finance back to the UK to minimise delays and costs. After repatriation, the financing and tax structure will be even more transparent.</p> <p>The financing strategy is explained to bond investors every year at the annual investors' roadshow. It includes a presentation on liquidity, the maturity profile of debt, the approach to refinancing, and plans for current and future AMPs.</p>	<p>Along with the improvements in its financial systems, the closure of its Cayman Finance Company will be a positive step forward, pushing the company to a level 4.</p>	Level 3	Level 4	Level 3.6	Level 3.9



## 6. Resilience assessment for Welsh Water: Finance and Governance

### Ensuring robust finances and benefits to the economy

**Documents reviewed:** Glas Cymru Holdings Cyfyngedig 2018, Glas Cymru Holdings Cyfyngedig 2017, Ofwat, 2017d



Develop accessible and robust monitoring and reporting for financial performance

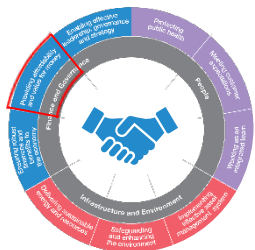
Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Preliminary Industry benchmark			
		Now	AMP7 & beyond	Now	AMP7 & beyond
<p>The Annual Report is designed to be readable by stakeholders and the interested water customer. For example, the Glas Cymru Holdings Cyfyngedig 2016/17 Annual Report included a pie chart showing the breakdown of a bill into maintenance, employees, taxes, investment, and monies that are reinvested in improving services or helping customers who struggle to pay their bills. This does not appear to be in its latest Annual report, and would have been a useful addition.</p> <p>Ofwat 2017 states Welsh Water exceeds expectations with "clear evidence that the company's reporting is transparent and accessible to customers and other stakeholders."</p> <p><b>Overall. with further improvements to be made to its internal monitoring processes and with the Cayman Finance Company reducing transparency for customers, Welsh Water scores a level 3.</b></p>		Level 3	Level 4	Level 3.6	Level 3.9

**Areas to enhance:** Welsh Water's financial monitoring is in place and effective, though Ofwat has minor concerns. Welsh Water should try to secure Ofwat's 'Self Assured' status in 2017/18 and beyond. It should also consider running sensitivity tests more often.

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Providing affordability and value for money



### Safeguard long-term progressive customer dividend

#### What leading looks like (Level 5):

Any savings that the company makes are passed onto the customer through customer dividends. Investment also helps to achieve a wider resilience dividend, providing wider benefits across the business, customers and the environment. There is a strategy to continue to deliver this in the long-term.

**Documents reviewed:** Consumer Council for Water, 2016, Welsh Water 2017c, Welsh Water 2017d, Welsh Water 2018a

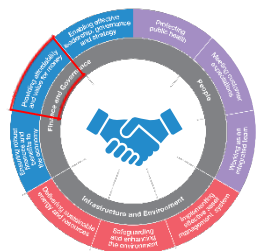
Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Preliminary Industry benchmark			
		Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water has a process to reinvest the customer dividend in one of three ways: to reduce bills; as additional investment; or as social tariffs<sup>15</sup>. This is protected through the dividend policy, the Whole Business Securitisation Common Terms Agreement and the Articles of Association.</p> <p>There is no formal commitment to deliver a customer dividend that increases every year. Customer dividends can only be paid once all other costs (including operating costs, tax and repayments to bond financiers) have been paid. If a very low Weighted Average Cost of Capital is set for an AMP period it follows the size of the customer dividend will be less. Similarly, if unexpected events happen in a year the available profits to pay the customer dividend will be less.</p> <p>Welsh Water 2050 is a long term strategy with the provision of resilience dividends as a key part of the strategy. For example, following the 'Have your Say' customer consultation in 2016, customers said they preferred to reinvest the surplus. Many of the investments were to improve resilience, for example investing an extra £11million to include 24 hours of emergency water storage in the Hereford area, and investing £5million to reduce the potential impacts of flooding in Central Cardiff and Cardiff Bay.</p> <p><b>As the only not-for-profit company in the sector, Welsh Water is considered to be leading (level 5) in this area.</b></p>	<p><b>The customer dividend approach will continue, and thus a level 5 will remain.</b></p>	Level 5	Level 5	N.A.	N.A.

**Areas to enhance:** Whilst the Weighted Average Cost of Capital that will be allowed is set by the regulator, Welsh Water needs to continue to look for efficiencies and new ways of working to reduce operating costs where possible, thereby increasing the amount of the customer dividend.

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Providing affordability and value for money



### Ensure affordability and value throughout the business

#### What leading looks like (Level 5):

There are systems and a business culture that capture new and innovative approaches to improve efficiency of projects, with a view to improving affordability for customers and the quality of customer services. This is reflected in high customer service and satisfaction scores.

**Documents reviewed:** Consumer Council for Water, 2016, Welsh Water 2017c, Welsh Water 2017d, Welsh Water 2018n

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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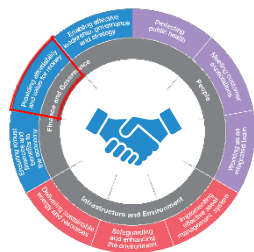
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Preliminary Industry benchmark			
		Now	AMP7 & beyond	No w	AMP7 & beyond
<p>Efficiency is an important narrative throughout the business. Risk and value are analysed on all projects. This is undertaken as part of the capital investment process and applied to all part of Welsh Water and their external partners. It is an economic approach to risk management and considers whole life cost using net present value. This process will need to be updated to better reflect resilience and look wider than traditional costs<sup>12</sup>.</p> <p>Only 27% of customers prefer that bills be reduced (Welsh Water, 2017c). Most customers think that their water bills are not too high, especially compared to other utilities (Welsh Water, 2017d). In customer surveys, 82% believe that Welsh Water's bills represents good value for money (Consumer Council for Water, 2016).</p> <p>Welsh Water is developing a new Water Network Alliance, which combines their current maintenance and repair contracts, and is expected to achieve £10million efficiency per annum. This is also expected to provide economies of scale, reduce programme risk and allow better co-ordination. This will help to ensure affordability for customers.</p> <p>Welsh Water's iLab initiative is part of the governance process that Welsh Water has in place to manage and prioritise new ideas across their entire business, many of these are focused on delivering efficiencies.</p> <p>The Welsh Water Capital Delivery Alliance is working to create an optimisation team, in order to help configure assets in a more efficient and cost-effective manner. They also have an innovation manager and innovation forum, which has developed an innovation strategy. It has been developed in order to help meet the objective 'Embed a Culture of Creativity and Innovation'. It is yet to be implemented, but is planned to link relevant elements of the Alliance Business Plan to ensure a consistent approach to innovation across the Alliance. They are also trialling a new Alliance contract to incentivise efficiency and better collaborative working.</p> <p><b>Plans are in place to improve efficiency, thus scoring level 3.</b></p>	<p>Welsh Water's plan for AMP7 includes a target to further reduce operating and maintenance costs by around 10% over the period 2020-25. This includes savings with regards to capital delivery, central support costs and transformation to the retail business (Welsh Water 2018n).</p> <p>Welsh Water expects its Water Network Alliance to be fully operational by the beginning of AMP7, providing £10million of efficiency savings per year. It also expects the new Alliance contract to begin delivering efficiencies in the capital delivery programme.</p> <p><b>Work is in progress to improve efficiency, thus scoring level 4.</b></p>	Level 3	Level 4	N.A	N.A.

**Areas to enhance:** As a not-for-profit company, Welsh Water will need to continue to drive efficiency and innovation through:

- Creating a pro-active approach to developing a culture of continuous efficiency
- Tracking the customer reserves that the regulatory business plan should deliver and incentivising Executive Directors to deliver this through the long-term incentive plan
- Meeting or beating cost (and therefore the results of innovation) standards set by leading water companies through the Price Control process
- Continuing to have a clear focus on innovation at Board discussions.

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Providing affordability and value for money



### Develop innovative and inclusive collection methods

#### What leading looks like (Level 5):

The company recognises that their customers can experience vulnerability in different ways in different periods of their life. Extensive social tariffs have been rolled out. There is an effective process to allow all customers to pay outstanding bills easily.

**Documents reviewed:** Consumer Council for Water (CCW), 2017, Welsh Water, 2018a, Welsh Water, n.a.d,

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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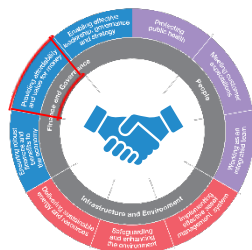
#### Preliminary Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Customers are able to pay bills through different methods; i.e. both paper and website. Welsh Water recognises that while services like online accounts are only used a few times a year they are essential for customers and the company therefore aims to keep them as easy to use as possible<sup>19</sup>. There is a bilingual chat-bot to help customers navigate the online system.</p> <p>It is estimated that 23% of Welsh households are currently in poverty, which has risen in the last few decades. Social deprivation is higher in Wales than many other parts of the UK.</p> <p>Welsh Water has identified over 25,000 customers as vulnerable, and captured these in the priority services register. Welsh Water has responses in place to deal with a range of vulnerabilities through inclusive and innovative collection methods. This is the second highest number of customers on priority service register for Water and Sewerage companies in 2017 per 10,000 connections (CCW, 2017) <sup>19</sup>.</p> <p>Welsh Water has informal links with 150 community and third sector groups. These are partners to help identify and work with these vulnerable customers. This includes local authorities, job centres, and money advice charities (Welsh Water, n.a.d).</p> <p>In response to customers in states of financial vulnerability, Welsh Water launched its current social tariff, 'HelpU' in 2015. Take-up has increased since this came into being, and 2,000-3,000 new customers register each month (Welsh Water, n.a.d). This programme supports a significant number of people. Welsh Water has the most customers registered on social tariffs in 2016-2017 per 10,000 customers for water and sewerage companies (CCW,2017)<sup>19</sup>. The number of people on social tariffs have significantly increased since 2016/2017 from 20,811 to 110,000 customers in July 2018<sup>19</sup>.</p>	<p>The retail business has made plans up to 2025, but is not keen to plan further due to technology changes. There is a Vulnerable Customer Strategy for PR19, to be published in September<sup>2,19</sup>. This aims to proactively identify customers that need support and prioritises the role Welsh Water has in providing employment opportunities to help marginalised and disadvantaged communities<sup>19</sup>. This includes working with partners to understand the barriers they face. This plan recognises that no two individuals are the same so flexibility is required to adapt to individual circumstances.</p> <p>The AMP7 retail plan, based on horizon scanning undertaken by the Business Information Systems team (BIS), focuses on building the capability to deal with the two main threats that have been identified which is how to deal with change in economic circumstances and the pace of technological enhancements.</p> <p>Welsh Water aim to significantly increase the number of customers on priority service register to 100,000 customers by 2025<sup>19</sup>. They are planning to work with other utilities, Local Authorities and Health Boards to share vulnerability data and better identify who should be on the register<sup>19</sup>.</p> <p>There is a focus on developing a better process to identify vulnerable people and to deal with people who are transiently in a vulnerable situation<sup>19</sup>. Learnings from the Water Resilient Community pilot will be rolled out in the future, with the programme planned for roll out to one new community per year<sup>24</sup>.</p>				
		Level 5	Level 5	N.A	N.A.



## 6. Resilience assessment for Welsh Water: Finance and Governance

### Providing affordability and value for money



### Develop innovative and inclusive collection methods, continued

**Documents reviewed:** Consumer Council for Water (CCW), 2017, Welsh Water, 2018a, Welsh Water, n.a.d,

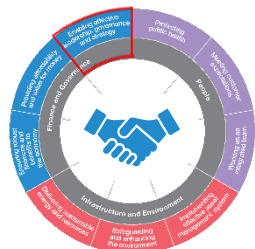
Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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		Preliminary Industry benchmark			
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP 7 & beyond
<p>Welsh Water has recognised that in some geographies, social tariff take-up is lower than the socio-demographic profile of the area would suggest it should be. A pilot project has been set up to explore ways to address this issue. The Rhondda Fach Water Resilient Community pilot was an innovative approach to engaging with customers. It will be used to develop insight into the particular issues and challenges for customers in vulnerable circumstances, so that Welsh Water can further develop its approaches.</p> <p><b>Welsh Water has an extensive social tariff offering with the highest take up for a water and sewerage company. Work to encourage take up is being undertaken including consideration of other types of vulnerable circumstances, thus achieving level 5.</b></p>	<p>There is a plan to establish an Affordability Team to oversee:</p> <ul style="list-style-type: none"> <li>Greater emphasis on most disadvantaged communities</li> <li>Proactive approach – working with local authorities and customer representative groups</li> <li>Providing advice on money saving options</li> </ul> <p>Other plans in AMP7 include:</p> <ul style="list-style-type: none"> <li>Piloting scheme with BACS to trial a flexible direct debit for financially vulnerable customers, Welsh Water are the first company in the UK to trail this scheme<sup>19</sup>.</li> <li>Funding of debt advisor with Citizens Advice</li> <li>Introduction of Well-being Champions</li> <li>Training for how to spot vulnerable customers</li> <li>Working with Local Authorities on 'tell us once' schemes for bereaved families and teams trained to deal with bereaved families<sup>19</sup>.</li> </ul> <p><b>Welsh Water has considered the full range of customers who may need support, and plans extend key programmes like the Water Resilience Community programme, thus continuing to score level 5.</b></p>	Level 5	Level 5	N.A	N.A

**Areas to enhance:** The vulnerable customer strategy has considered the full range of customers who may need support, people with disabilities or physical health issues, mental health issues and life events the strategy could be more explicit how it will deal with other challenges such as language barriers.

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Enabling effective leadership, governance and strategy



### Develop and promote a long-term organisational strategy

#### What leading looks like (Level 5):

There is a clear company vision which is well communicated and is recognised by with all, both internally and externally. There is a comprehensive long-term (30 year) organisational strategy, with policies and programmes to provide effective leadership which respond to potential future stresses and uncertainties. All plans and decisions are based on how they will work towards this strategy. Customers should also be able to clearly understand and share the business values.

Documents reviewed: Welsh Water 2018a

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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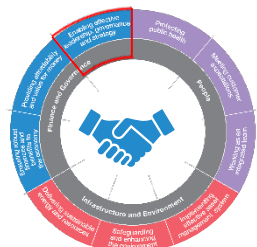
		Preliminary Industry benchmark			
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water has created Welsh Water 2050 (Welsh Water, 2018a) as their long term organisational strategy, with a clear mission, looking over 30 years into the future. This includes a prioritised list of future trends that may impact Welsh Water's business both as challenges and opportunities. It also aligns with legislation and guidance.</p> <p>This includes a comprehensive list of 18 programmes of work for the future, called 'strategic responses'. All future plans aim to work towards the completion of this strategy. In the development of Welsh Water 2050, Welsh Water undertook wide engagement and consultation with stakeholders and customers. This included engagement with over 20,000 customers and amended the strategy based on this consultation.</p> <p><b>Welsh Water has developed Welsh Water 2050, thus scoring level 4.</b></p>	<p>Using a suite of Measures of Success (MOSs), Welsh Water plans to measure the progress that they are making against each strategic response and also against each segment of the "Resilience Wheel". They plan to publish an annual performance report to customers, measuring continual progress towards the strategy.</p> <p>In addition, Welsh Water plans to review their long-term vision and resilience model, with specialist independent input and a wide-ranging opportunity for customers and other stakeholders to get involved. This aims to include a review of international best practice, horizon scanning to review future trends, an assessment of progress towards delivering strategic responses, progress towards objectives and the suitability of priorities.</p> <p><b>In order to achieve level 5, Welsh Water would need to undertake further dissemination activities to truly embed this strategy.</b></p>	Level 4	Level 4	Level 3	Level 3.4

**Areas to enhance:** Welsh Water 2050 was officially launched externally at the Senedd in March 2018. Internally, there are pockets of understanding of Welsh Water 2050, but more could be done to help individuals understand the contribution that they can make to achieving the goals in Welsh Water 2050. For example, by working to help employees develop new ways of working to contribute to the strategy, and feeling a greater sense of shared direction, both within Welsh Water and its supply chain. There is also a specific opportunity to communicate the alignment of Welsh Water's PR19 Retail Plan with Welsh Water 2050. The importance of resilience is well understood at a high level across the organisation. However, there is a need to develop methods and approaches to realise the resilience value throughout projects, be these capital projects or otherwise. Welsh Water may also wish to consider the role its people could play in the continual learning and improvements to its long-term strategy

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Providing affordability and value for money

**Documents reviewed:** Welsh Water 2015, Ofwat 2017, Welsh Water 2018o



### Effective governance and assurance processes

#### What leading looks like (Level 5):

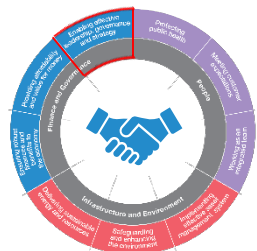
The company has reliable and well disseminated processes, roles, governance and reporting covering all aspects of the business. There is a clear process for assurance, approval and board sign-off.

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Preliminary Industry benchmark			
		Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water is owned by Glas Cymru which is a 'company limited by guarantee' run for the benefit of its customers. Glas Cymru has no shareholders and so its corporate governance functions are the responsibility of its board, which has a majority of independent non-executive directors, and its members, around 70 unpaid individuals appointed by an independent panel.</p> <p>The board meets 10 times per year for two days as a joint meeting between the Glas Cymru board and the Dwr Cymru board, unless a separate meeting is required. This covers strategy and control, risk management, board membership, communications, finances, regulation, litigation, policies and insurance (Welsh Water 2015). Welsh Water also has an AGM, where key resolutions are voted upon, which has 75% turnout<sup>15</sup>.</p> <p>Members of the board also sit on the committees below this: the finance committee, audit committee, remuneration committee, nomination committee, and the quality and environment committee. There are also team meetings with set chairs for different areas of the business: operations, retail, capital programme, information security, ideas lab, systems and change and health and safety steering group. The Ofwat Company Monitoring framework assessed that Welsh Water is meeting board leadership and governance principles (Ofwat, 2017). It also found that the assurance plans exceed expectations.</p> <p>The audit team audits both functions and processes across the business<sup>5</sup>. There is significant monitoring and data collection. The company has a full company audit every five years<sup>5</sup>.</p> <p><b>Despite not being a publically listed company, Welsh Water uses many of the good practice governance required for these, thus scoring level 4.</b></p>	<p>Welsh Water is due to submit their PR19 Business Plan by September 2018. This plan will have full board assurance.</p> <p><b>In order to achieve level 5, Welsh Water would need to identify clear governance with relation to resilience, in particular identifying senior ownership of this topic.</b></p>	Level 4	Level 4	Level 3.6	Level 4
<p><b>Areas to enhance:</b> The business currently carries out comprehensive audits of processes across the business. Whilst this is difficult to measure and assess, there may be opportunities to audit the organisation's culture, and to improve controls to mitigate risks<sup>5</sup>.</p> <p>There is currently no single owner of resilience within the organisation. Our experience suggests that having this focus and accountability at a senior level is important in order to identify interdependencies and fully realise the potential resilience value that could be created.</p>					

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Providing affordability and value for money



### Develop effective business continuity planning

#### What leading looks like (Level 5):

There is an all hazards approach to resilience planning linked to the National Risk Register and the likely impact on service to customers. A business continuity plan is in place to prepare for, respond to and recover from the potential impact. This is shared with staff and partners, and everyone should be clear on their roles in an emergency situation. This plan and the associated controls are regularly trained and exercised. All critical assets have emergency response plans and all critical teams are able to recover to minimise impact on service. These approaches follow recognised best practice as in ISO22301.

**Documents reviewed:** Welsh Water 2014, Ofwat letter to Welsh Water, Out from the Cold

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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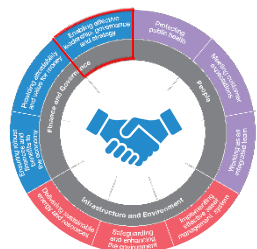
#### Preliminary Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water has demonstrated high degrees of compliance with not only the 'Securities and Emergency Measures Directive' (SEMD) reported to Welsh Government, but also with the 'tri-annual' Critical National Infrastructure audit process<sup>36</sup>.</p> <p>At every committee and team meeting, risk is discussed and reported up to the Executive team. Risks are highlighted to the board at each board meeting and risks are looked at in more detail quarterly<sup>15</sup>. The audit committee discusses these risks in more detail<sup>15</sup>. These are mainly focused around short to medium term risks, linked to AMP cycles<sup>5</sup>.</p> <p>Welsh Water's incident response structure is detailed in their Emergency Response Manual. There are gold and silver teams tasked with getting the service back to normal. There is a programme of exercises each year to test responses to scenarios. Welsh Water is very effective at getting extra staff support in extreme events, with staff from across the business manning the customer lines during the February/March 2018 freeze thaw event (Storm Emma), for example. However many found it difficult to use the SAP (Systems Applications and Products) software. Plans to create a more intuitive version and wider training are in progress to deal with this<sup>11,19</sup>. Welsh Water was commended by Ofwat on their customer communications during Storm Emma<sup>24</sup>.</p> <p>Welsh Water's Water Total Loss Contingency plans identify points of weakness in its system, including where energy supply loss could affect service delivery.</p> <p>Welsh Water is currently rolling out incident management software which will make information centrally visible, this will be used by the gold and silver teams. The business continuity processes have been developing in line with ISO22301, but are not accredited to the standard. An emergency management audit is undertaken annually for Welsh Government. Members of the emergency planning team undertake the emergency planning Cabinet Office training<sup>1</sup>.</p>	<p>We understand that the PR19 plan includes:</p> <ul style="list-style-type: none"> <li>• Providing standby power generators to improve the resilience at operational depots.</li> <li>• Mobile phone coverage in silver rooms at all operational depots.</li> <li>• Updating the emergency bowser plans (where they are deployed in different areas if the water supply was unavailable).</li> <li>• Total loss contingency manuals update.</li> <li>• Mobile command centre replacement.</li> <li>• Updating emergency response plans<sup>1</sup>.</li> <li>• Learning from the response to 'Storm Emma' and the 2018 Summer Drought<sup>36</sup>.</li> </ul> <p>Welsh Water plans to expand their planning tool for modelling their overall network capacity to cover the whole of Wales.</p> <p>There are plans to improve localised customer communications through enhances social media and using customer segmentation to target communications better, especially to customers in vulnerable circumstances<sup>24</sup>.</p>	Level 4	Level 4	Level 3.8	Level 4.1



## 6. Resilience assessment for Welsh Water: Finance and Governance

### Providing affordability and value for money



### Develop effective business continuity planning, continued

**Documents reviewed:** Welsh Water 2014, Ofwat letter to Welsh Water, Out from the Cold

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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		Preliminary Industry benchmark			
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>More recently, Welsh Water has replaced its complete IT network and Data Centre infrastructure with enhanced cyber protection. An independently assessed programme of cyber protection and planned achievement of ISO27001 is underway for completion by 2020<sup>36</sup>.</p> <p>Welsh Water is making increasing use of new technology to digitise operating procedure manuals. This is currently being 'piloted' for WTW operating manuals (WOMs) and will be subsequently rolled out to business continuity and other contingency plans – e.g. 'total loss contingency plans for treatment works'<sup>36</sup>.</p> <p>Welsh Water works with partners through Local Resilience Fora to carry out exercises and test plans<sup>1</sup>.</p> <p><b>Welsh Water has a crisis management plan that is proven to help them respond to events, e.g. Storm Emma, thus scoring level 4.</b></p>	<p>Following the experience of 'Storm Emma' it is intended to enhance the current Emergency Procedures for further integration of management of customer communications into the crisis management and 'Gold' level command structures. The Ofwat 'Out in the Cold' report provided positive feedback on Welsh Water customer communication process during 'Storm Emma'. This plan was recently shared as 'good practice' at the Water UK 'post Freeze / Thaw' workshop on 13 July 2018<sup>36</sup>.</p> <p>There are also plans to create satellite customer contact centres and the introduction of home working to increase the resilience of customer communications. Systems are also becoming cloud-based to improve security and the ability for working outside Welsh Water offices<sup>19</sup>.</p> <p><b>In order to become leading, Welsh Water would need to follow ISO22301, and develop further collaboration and emergency exercising with partners.</b></p>	Level 4	Level 4	Level 3.8	Level 4.1

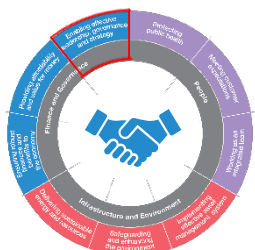
#### Areas to enhance:

Through a high-level review of their response to Storm Emma, Welsh Water has recognised a number of actions to improve its business continuity and emergency response approach. This includes a strengthening of management and analytical capability in incident teams, and additional activity to enable a better response in rural areas. Embedding these lessons learnt in business as usual is vital to ensure that future extreme events can continue to be dealt with effectively.

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Providing affordability and value for money

**Documents reviewed:** Welsh Water 2018a, Welsh Water 2018c



### Align all actions with local and national policy and legislation

#### What leading looks like (Level 5):

There is one clear and integrated strategy that is co-ordinated with national policy, legislation and regulatory guidance, whilst also drawing on global best practice. Only projects that follow this strategy and achieve the vision are undertaken.

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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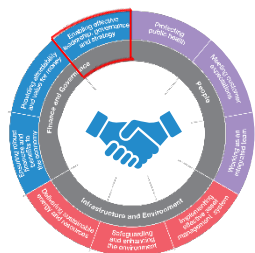
		Preliminary Industry benchmark			
Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Welsh Water 2050 is a business wide-clear and integrated strategy. Shorter-term investments now align with this long-term vision. Welsh Water 2050 is aligned with current policy, legislation and guidance. For example, it demonstrates alignment with the WFGA, Environment (Wales) Act 2016, Contribution to the Water Strategy for Wales and Contribution to the State of Natural Resources Report (SoNaRR) (Welsh Water 2018a). Other plans, like the WRMP, include a strategic environmental assessment which aligns with the WFGA (Welsh Water 2018c).</p> <p><b>Welsh Water works collaboratively with Welsh Government and regulators to inform and influence policy, rather than just responding to it, thus demonstrating leading practice and level 5.</b></p>	<p>There are plans to assess and update Welsh Water 2050 every five years; during this review, changes in policy, legislation and regulatory guidance will be considered (Welsh Water 2018a).</p> <p>Welsh Water's plans for PR19 are very closely aligned with Welsh Water 2050. They also have a unique and close relationship with the Welsh Government, regulators and ministers. However, at present it is not clear how the Welsh Water Retail Plan aligns with the overarching 2050 strategy.</p> <p><b>Welsh Water will continue to collaborate with policy makers and regulators in delivering Welsh Water 2050, continuing to score level 5.</b></p>	Level 5	Level 5	N.A.	N.A.

#### Areas to enhance:

Brexit offers an opportunity and focus for policy discussions in Wales and the UK over the coming months. Welsh Water is already engaged in these conversations, and has the opportunity to further influence farming and environmental policy in particular, but perhaps also labour market discussions. It is recommended that the organisation develops methods and approaches to ensure the 2050 strategy and an understanding of resilience value is embedded in all project decision making. Welsh Water could work more collaboratively with regulators to trial new approaches to regulation to deliver the outcomes that are right for their customers and the environment.

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Providing affordability and value for money



### Create space for innovation and horizon scanning

#### What leading looks like (Level 5):

Research, both internal and in collaboration with external partners is a key part of the business. Work on innovation projects is encouraged with time, funding and the support of the company's leaders. Furthermore, customers have an input into decision making for innovation. All stages of innovation are considered from horizon scanning and definition through to delivery and dissemination.

Plans, strategies and actions are all based on the outcome of comprehensive and robust horizon scanning which takes into account future shocks and stresses that may impact areas of the business. Horizon scanning is regularly reviewed and informs plans and programmes across the business.

**Documents reviewed:** Cave 2009, Welsh Water & ORC 2017, Welsh Water 2018a, Welsh Water 2018v, Welsh Water 2018u.

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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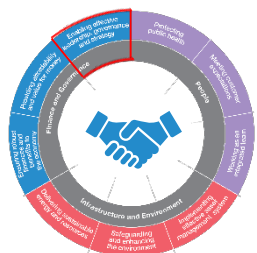
#### Preliminary Industry benchmark

Welsh Water's performance now	Welsh Water's plans for AMP7 and beyond	Now	AMP7 & beyond	Now	AMP7 & beyond
<p>Significant focus, support and funding has been provided for research and innovation in AMP6, with innovation investment at c.£39million, which is c.1% of turnover, in line with the industry average.</p> <p>Rather than having a single innovation team, responsibility for innovation is delegated to all heads of service across the company<sup>22</sup>. iLab is part of the governance process that Welsh Water has in place to manage and prioritise new ideas.<sup>22</sup> 90% of staff think that there is a culture of looking to improve the way that Welsh Water works. 77% of staff think that they are encouraged to come up with new ideas (Welsh Water &amp; ORC, 2017). The capital delivery alliance also has a separate innovation strategy and process that runs in parallel to the iLab process. (Welsh Water, 2018v)</p> <p>Welsh Water undertakes joint funding initiatives and works in partnership with others on innovative solutions, e.g. UKWIR research or partnership working with NRW on difficult issues. There is current work underway to develop new, innovative means to capture customer feedback better through a customer sentiment dashboard. Welsh Water also has a reward and incentivisation mechanism in place to acknowledge development of innovative ideas and pilot projects through its partnership with Sustain Wales.</p> <p>Horizon scanning was a fundamental part of the evidence base to support Welsh Water 2050. Future trends were considered over a 30 year time horizon, to 2050 in Welsh Water 2050. The hackathon carried out recently by the wastewater business, collaborating with other teams, is a notable example of Welsh Water's trialing a new approach to refining its innovative outputs quickly.</p> <p><b>Welsh Water scores a level 3, as whilst there are processes in place for horizon scanning and innovation, these are not yet embedded into the organisational culture, particularly when it comes to creating space to fail.</b></p>	<p>Welsh Water's AMP7 plan includes £73million for research and innovation, with projects identified in all parts of the business (Welsh Water 2018n). It includes around £15million on environmental investigations to determine the most efficient, collaborative solutions to achieve longer term environmental standards.</p> <p>Through Welsh Water 2050, Welsh Water has committed to horizon scanning for future trends every five years. As a substantive step towards realising this, the company is keen to influence the government regulatory policy to align with customer needs, to meet innovation targets and to decide on investment areas. For example, regulatory risk sharing to develop innovation solutions on new catchment approaches is being considered. (Welsh Water, 2018u)</p> <p><b>There are no further plans to enhance the organisational culture in this respect, thus continuing to score a 3.</b></p>	<b>Level 3</b>	<b>Level 3</b>	<b>Level 2.7</b>	<b>Level 3.1</b>

## 6. Resilience assessment for Welsh Water: Finance and Governance

### Providing affordability and value for money

**Documents reviewed:** Cave 2009, Welsh Water & ORC 2017, Welsh Water 2018a



### Create space for innovation and horizon scanning, continued

Level 1: Unaware of indicator	Level 2: Aware a response should be developed	Level 3: Response developed	Level 4: Response in progress	Level 5: Leading
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#### Areas to enhance:

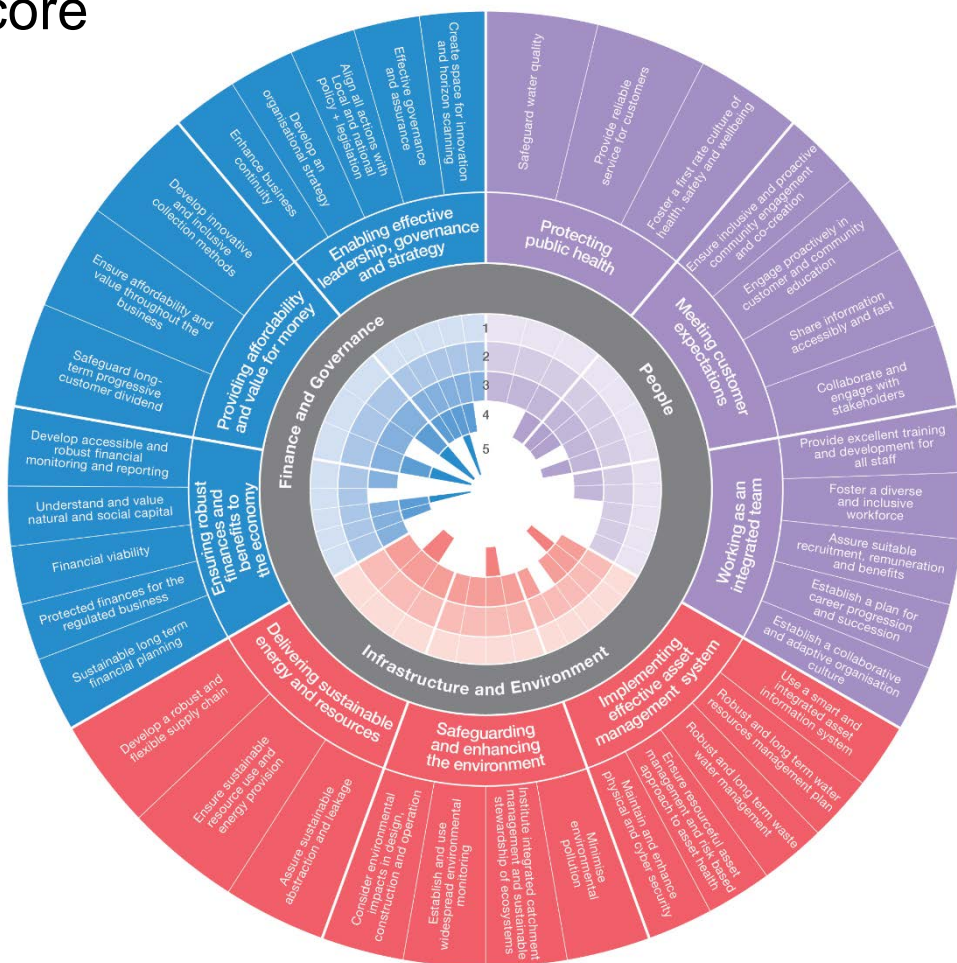
There is an opportunity to use the horizon scanning undertaken in support of the development of Welsh Water 2050 more widely across the business. For example at present, Smart Hub and the Retail business look three to five years ahead based on knowledge of the technology available<sup>9,19</sup>, water resource planning uses data on future trends related to climate change and population growth. Welsh Water could consider whether there are certain trends where more regular horizon scanning would be valuable to better define challenges. Welsh Water has the opportunity to further improve its approach to defining and communicating challenges that require innovative solutions.

Welsh Water, in order to attain further maturity in an innovation context, could develop a clear innovation vision, strategy and roadmap. This would set out how Welsh Water could be more adaptive and agile in its approach to developing and delivering new ideas, products and services. This will allow Welsh Water to make space for failure, to enable innovative ideas to fail fast and for iteration and learning. There is an opportunity to develop a stronger people change capability, Welsh Water can develop a more strategic approach to partnerships and tap into opportunities for greater collaboration between teams across all stages of innovation. Welsh Water also has the opportunity to embed cultural and people change to support the processes and systems that they have in place. There is also an opportunity to further combine innovation processes with delivery and business and usual processes to deliver maximum value, so new ideas can become fully embedded.



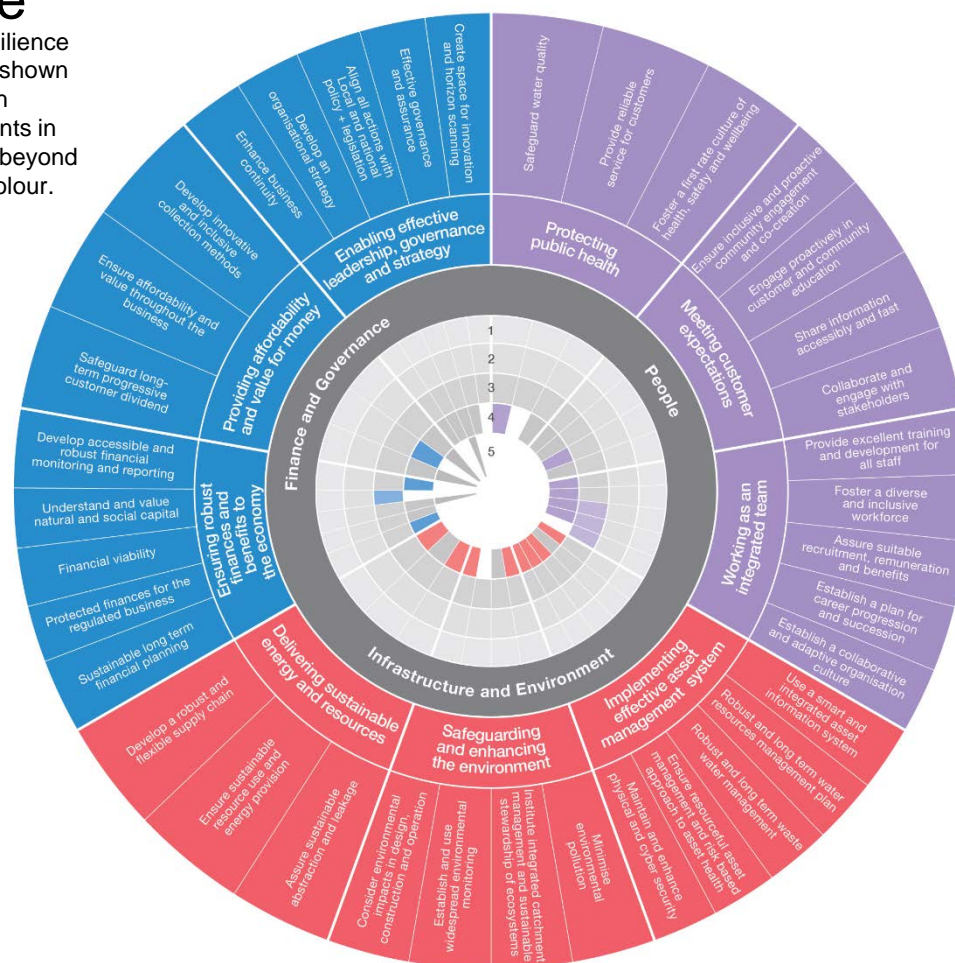
## 6. Maturity assessment for Welsh Water Overall scores

### Current Score



### Future Score

Current resilience scores are shown in grey, with improvements in AMP7 and beyond shown in colour.



			Level 5 Leading
			Level 4 Response in progress
			Level 3 Response developed
			Level 2 Aware a response should be developed
			Level 1 Unaware of indicator

## 7. Next steps

### Embedding resilience in Welsh Water

This assessment has highlighted that Welsh Water has taken significant first steps in their resilience journey. This is particularly shown through Welsh Water 2050 which shared the company's vision for the next 30 years.

#### Cross-cutting recommendation

Welsh Water has the opportunity to develop a change programme to embed long-term resilient thinking across the organisation, and improve Welsh Water's adaptability to deal with uncertainty and change. This would encompass the people, process, information and technology programme needed to change mindsets and give staff, partners and customers the tools and capabilities needed to deliver Welsh Water 2050 and achieve multiple benefits, or "the resilience dividend". This would involve expanding the horizon scanning work currently undertaken and using the findings of this to update processes and planning, for example how Welsh Water plans for future skills.

#### People

##### **External communications**

Currently there are some good examples of stakeholder and external communication, such as the programme of engagement around Welsh Water 2050. It is clear that work is underway to build on project and programme-based customer engagement to

form a more holistic approach. Stakeholder mapping and management approaches may be helpful for strategic relationships.

Currently, during outages and events, there can be a gap in information provision between customer communications and operations. Welsh Water should consider ways of ensuring that information is shared effectively internally so that it can then be shared externally.

There is also an opportunity to make community education and outreach programmes more inclusive to reach a broader audience, rather than concentrating on project specific outreach.

##### **Developing skills and capabilities for the long-term**

Welsh Water is about to begin a strategic workforce planning exercise to identify current and future skills gaps. It is important that this consider the capabilities for Welsh Water to continue to deliver for their customers in the long-term, and the skills and behaviours needed for the organisation to become more resilient. This will then direct the necessary investment required to buy, build, borrow or automate the capability necessary to ensure the resilience. This work will help to identify staff potential, direct career conversations, talent, succession and recruitment decisions.

##### **Collaboration and change**

In addition to the cross-cutting recommendation on uncertainty and change, Welsh Water this should consider opportunities for virtual teaming and interdisciplinary working. The wastewater hackathon, which brought together teams from different parts of the business is a good example of a trial that could be built on.

#### Infrastructure and environment

##### **Smart and cyber**

Welsh Water has a significant number of legacy digital assets, which they are in the process of updating. There has already been significant investment in cyber protection and the programme is planned to be completed and independently assessed by the end of AMP6. Smart and cyber plans have further significant investment attached to them in AMP7. Welsh Water will need to consider how to effectively implement these upgrades swiftly, safely, and with users in mind to ensure that the company does not increase its susceptibility to cyber attack.

As there are plans to implement new technologies and processes across the business, Welsh Water will need accompanying people change programmes and capabilities to embed the use of this new technology into business as usual, and make

the most of its ability to predict and respond to events.

The smart strategy includes smart services for customers, for example, monitoring for leakage to improve customer experience. There could be increased focus on retail and customer service technology to ensure that the company's systems reflect the service that customers have come to expect from online retail companies.

##### **Environment**

There is consideration of the environmental impact of the capital work Welsh Water undertakes. Rainscape is a leading natural resilience approach that delivers environmental enhancements.

In order to contribute more widely to naturally resilient planning principles, Welsh Water could go further to consider environmental enhancements within the scope of its duties. Some environmental enhancements do take place through programmes such as the Biodiversity Champions. Ideas like this could be rolled out to all sites, offices and land owned by Welsh Water rather than just wastewater sites.

The company does collect some environmental data but could collect a more comprehensive data set. This could be used and shared as an environmental baseline of Welsh Water's assets.

## 7. Next steps

### Embedding resilience in Welsh Water

#### Asset resilience

Welsh Water knows the condition and the risk that is associated with key assets. This understanding could be enhanced through a wider consideration of hazards. This could be based on the UKWIR technical report 13/RG/06/3 which has an 'all hazards' list of the potential hazards that could be relevant to the UK water industry. This list includes hazards, such as fire and freeze thaw, which are not currently considered in the Resilience Scorecards. These Scorecards currently consider the impact on customers supplied by the asset. The impact of the hazards could be considered more widely, such as cost, impact on the environment, reputation or impacts on staff. Consideration could also be given to cascading impacts of failure on both their own network and other systems and sectors.

#### Resilient water resource management

Welsh Water has undertaken thorough plans for water resource management through the draft WRMP. This approach could be strengthened and made more robust by considering some of the following aspects:

- Real scenario testing, which is wider than climate and drought. This could include asset failure from other shocks and stresses like environmental change.
- Longer planning horizon, which considers longer timeframe than 2050 and

understands the 'tipping points'.

- Linking the approaches of the WRMP to wastewater and the DWMP.

#### Supply chain

Welsh Water could build on their plans to work more closely with their supply chain. The resilience of the company could be enhanced by reviewing the procurement needs of the business in the longer-term, to focus on potential strains across the supply chain as a network.

#### [Finance and governance](#)

##### Finance

Welsh Water has solid approaches to financial planning, management and monitoring, and its plans to repatriate its Cayman Island debt are to be welcomed.

More work is needed to start creating detailed breakdowns of planned year-by-year Opex and Capex investment in AMP8 and AMP9 in particular, drawing on the draft WRMP and the DWMP that will be completed in AMP7.

Thought could also be given to modelling more 'severe but reasonable' downside sensitivities, and developing strategies to be able to quickly flex social tariffs should unexpected shocks occur.

#### Innovation

Welsh Water's approach to innovation has improved dramatically over the last 10 years, and it is continuing to further develop its approach. This approach to improve Welsh Water's incentives for and exploitation of innovation will be critical, particularly given the not-for-profit business model means that there is less pressure on the business to innovate for efficiency from shareholders.

In particular, Welsh Water has opportunities to build on good processes for capturing innovative ideas with cultural and people change.

#### Valuing natural and social capital

Welsh Water has demonstrated how they deliver natural and social value through alignment with the WFGA. Exploration of how this can be embedded into investment and project decisions, particularly with regards to RainScape is important to become more resilient.

## Appendix A

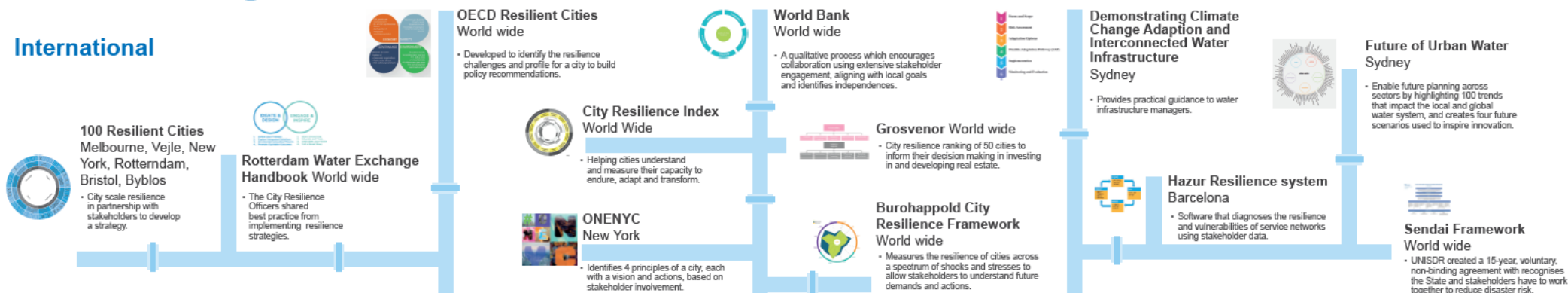
Resilience background and best practice that supported the development of Welsh Water's original Resilience Wheel



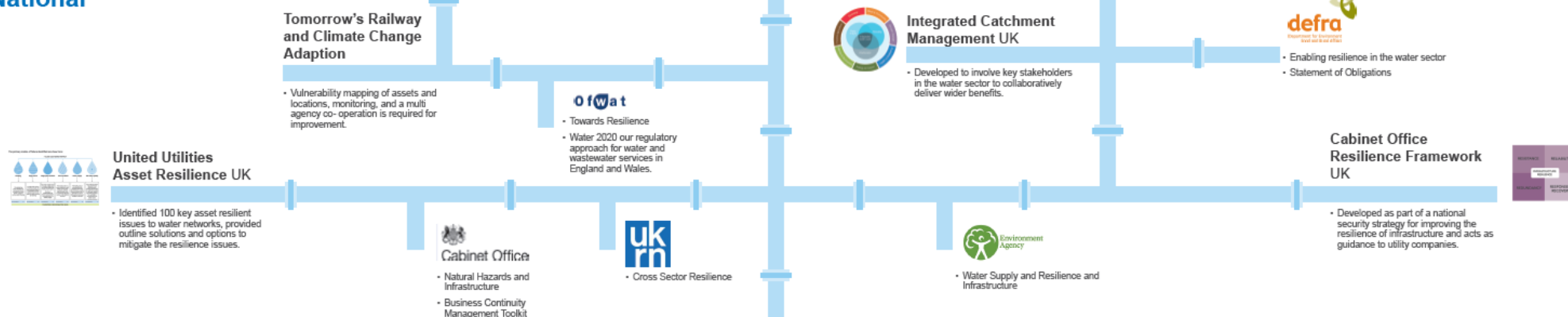
## Understanding resilience Review of global good practice

### Global Insight

#### International



#### National



#### Wales



Figure A1: A selection of the global good practice resilience work reviewed for this project. ©Arup



## Understanding resilience

### Overview

The full body of work reviewed to support the development of Welsh Water's Resilience Wheel is shown in figure A1 on the previous page. A couple of key pieces of guidance and literature are explain in more detail below.

### Cabinet Office Guidance

The Civil Contingencies Act (2004) sets an important framing for resilience in the UK. The Cabinet Office describes infrastructure resilience as “the ability of assets and networks to anticipate, absorb, adapt to and recover from disruption”. Resilience is secured through a combination of the principal components shown in Figure 1:

- **Resistance:** Concerns direct physical protection, e.g. the erection of flood defences;
- **Reliability:** The capability of infrastructure to maintain operations under a range of conditions, e.g. electrical cabling is able to operate in extremes of heat and cold;
- **Redundancy:** The adaptability of an asset or network, e.g. the installation of back-up data centres; and
- **Response and Recovery:** An organisation's ability to respond to and recover from disruption.



Figure A2: Infrastructure Resilience Components (Cabinet Office, 2011)

### City Resilience Index

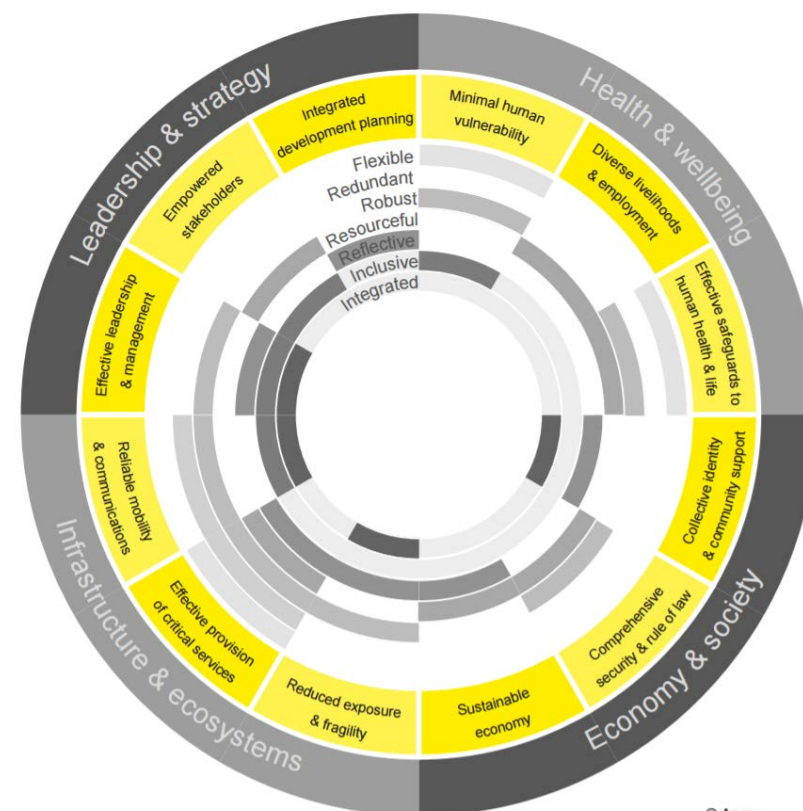
The City Resilience Index (CRI), developed by the Rockefeller Foundation and Arup provides a holistic articulation of city resilience. Its 12 resilience goals and 52 indicators are based on four key dimensions:

- Health and well-being,
- Economy and society,
- Infrastructure and environment,
- Leadership and strategy.

Expanding on the CRI and based on global best practice, Arup has also identified seven qualities that are fundamental to resilient systems:

- Flexible,
- Redundant,
- Robust,
- Resourceful,
- Reflective,
- Inclusive, and
- Integrated.

Although this index was specifically developed for cities, the body of research on resilience that supports it can be applied across sectors and systems.



## Understanding resilience

### Shocks and stresses

Understanding the shocks and stresses that Welsh Water might be exposed to is critical when considering the resilience of the organisation. However, resilience goes beyond a simple risk management approach, responding to long-term stresses and uncertainty as well as risks that are quantifiable and understood in the short-term.

In this context shocks are disruptive events, which impact the ability to provide a high quality service. In the water industry, acute shocks include sudden events such as floods, fires or cyber attacks. Stresses are chronic conditions which weaken the function of the organisation or system long-term. Examples highlighted in particular by Ofwat include population growth and climate change. Stresses are also often felt as shocks when they reach a tipping point.

As part of its original strategy on resilience, developed in early 2017, Welsh Water in collaboration with Cardiff University created a long list of possible shocks and stresses, and researched the potential impacts of these on the organisation. Cardiff University undertook an in-depth literature review of the key resilience challenges that will face Welsh Water in the future. The resulting list of shocks and stresses is shown in Table 1. Welsh Water then prioritised the main trends from this list and the most important

were highlighted in Welsh Water 2050. These include:

- Change in customer expectations,
- Protecting essential infrastructure (which includes ageing infrastructure, supply chain limits and cyber security),
- Demographic change,
- Changes to the structure of the economy,
- Policy and regulatory change,
- Climate change,
- Environmental change, and
- Protecting public health (which include trends such as lifestyle changes)

As part of the consultation for Welsh Water 2050, over 20,000 customers were engaged on the areas that they considered the most important. The final Welsh Water 2050 document reflects this feedback.

Shocks	Stresses
Social	Social
Terrorist Attack	Demographic Change
Civil Unrest	Urban Creep
Extreme Vandalism	Migration
Hoax Calls	Skills Shortages
Technological	Lifestyle Change
Cyber Attacks	Shortage of Skilled Labour
Power Outages	Technological
Asset Failure	Leakage
Telecommunication Failure	Ageing Infrastructure
Data fraud/ theft	Environmental
Dam Failure	Climate Change
Power Cuts	Drought
False Positive Alarms	Land Use Change
Environmental	Coastal Erosion
Water Supply Contamination	Environmental Change inc. Invasive Species
Temperature Extremes	Sea Level Rise
Infectious Diseases	Emerging Contaminants
Environmental Pollution	Economic
Fire Events	Growth vs Recession
Nuclear Incident	Financial Crisis
Flooding	Unmanageable Inflation
Economic	Bad Debt
Severe Energy Price Change	Resource Scarcity
Industrial Disputes	Fuel Supply and Costs
Supply Chain Failure	Increased Cost of Borrowing
Politico-legal	Changes to the Structure of the Economy
Abstraction Licences Change	Politico-legal
	Macro Industry Change
	Changing Regulation and Policy
	Brexit
	Legal Structures

Table 1: The shocks and stresses that may impact Welsh Water. Those highlighted in blue are those which were prioritised with Welsh Water 2050, those in grey are sub-trends highlighted in Welsh Water 2050.

# Appendix B

## Interviewees

## Appendix B: Interviewees

Name	Role	Reference	Name	Role	Reference	Name	Role	Reference
<b>Aled Daniel</b>	Emergency Planning and Security	1	<b>Mike Pedley</b>	Head of Energy	14	<b>Will Rees</b>	Physical security	27
<b>Anna Riddick</b>	Customer insight manager	2	<b>Nicola Williams</b>	Company Secretary	15	<b>Chris Jones</b>	Chief Executive	28
<b>Annette Mason</b>	Head of learning, talent and development	3	<b>Nikki Kemmery</b>	Head of Health & Safety	16	<b>Ian Christie</b>	Managing Director of Water Services	29
<b>Arfon Edwards</b>	Resilience Project Manager	4	<b>Peter Bridgewater</b>	Finance Director	17	<b>Steve Wilson</b>	Managing Director of Wastewater Services	30
<b>Clive Hardy</b>	Head of Business Assurance	5	<b>Peter Davies</b>	Chair Customer Challenge Group (CCG)	18	<b>Nick Parkin</b>	Head of Dam Safety	31
<b>Brendan McAndrew</b>	MWH	6	<b>Samantha James</b>	Household customer services	19	<b>Amanda Soady</b>	Head of Water Distribution	32
<b>Dale Walker</b>	Head of Smart/OT	7	<b>Sharon Ellwood</b>	Head of Wastewater assets	20	<b>Scott Beard</b>	Head of Water Engineering	33
<b>Dan Davies</b>	Regulatory Strategy Manager	8	<b>Sian Robinson</b>	Director of Procurement and Estates	21	<b>Marek Cegielski</b>	Head of Water Production	34
<b>Dave Collins</b>	Head of Smart Hub	9	<b>Tony Harrington</b>	Director of Environment Leakage Optimisation Manager	22	<b>Lee Pearce</b>	Head of Water Network Alliance	35
<b>Dave Taylor</b>	Head of Water Assets	10	<b>Wayne Arscott</b>	Director of Customer Strategy and Communication	23	<b>Peter Perry</b>	Managing Director Wastewater Strategy	36
<b>Linda Williams</b>	Director of HR	11	<b>Alun Shurmer</b>	Head of Water Science Services	24	<b>Fergus O'Brien</b>	Manager	37
<b>Martin Hennessey</b>	Director of Capital Delivery	12	<b>Philippa Pearson</b>		25			
<b>Mike Davis</b>	Strategy and Regulation Director	13	<b>Chris Jones</b>	Asset Manager	26			



# Appendix C

## Bibliography

## Bibliography

- Cave M., 2009, Independent Review of Competition and Innovation in Water Markets: Final Report, April 2009.
- Consumer Council for Water (CCW), 2016, Water Matters Household customers' views on their water and sewerage services 2015, Online, <https://www.ccwater.org.uk/wp-content/uploads/2016/06/CCWater-WaterMatters-Report-to-client-FINAL20.pdf> [Accessed 18/05/18]
- Consumer Council for Water (CCW), 2017, Staying afloat: customer vulnerability in the water sector – 2016-2017, 13<sup>th</sup> Spetember 2017, online <https://www.ccwater.org.uk/research/staying-afloat-customer-vulnerability-in-the-water-sector-2016-2017/> [accessed 29/08/18]
- Deutsche Trustee Company Limited. 2016. Amendment and restatement agreement relating to a common terms agreement originally dated 10 May 2001. March 2016.
- Dŵr Cymru Cyfyngedig, 2012, Annual Accounts 2011/12. July 2012.
- Dŵr Cymru Cyfyngedig, 2018, Annual Accounts 2017/18. June 2012.
- Financial Times. 2018. Gove warns water companies over use of offshore tax structures. January 2018. Online <https://www.ft.com/content/28f18778-f91c-11e7-a492-2c9be7f3120a> [accessed 17/05/18]
- Glas Cymru Holdings Cyfyngedig. 2018. Annual Report 2017/18. June 2017.
- Glassdoor, 2018, Working at Welsh Water, Ratings and Trends, Online [https://www.glassdoor.co.uk/Overview/Working-at-Welsh-Water-EI\\_IE10269.11,22.htm#trends-overallRating](https://www.glassdoor.co.uk/Overview/Working-at-Welsh-Water-EI_IE10269.11,22.htm#trends-overallRating) [accessed 05/06/18]
- Jacobs & Welsh Water, 2017, DCWW non-financial assurance, 2017 DCWW SEMD certification report, March 2017.
- Ofwat, 2018a, Expectations for companies in issuing long-term viability statements. IN 18/04. March 2018.
- Ofwat, 2018b, Information on Long Term Viability Statements, Letter from Aileen Armstrong. 20 March 2018.
- Ofwat, 2018a, Information on Long Term Viability Statements ('LTVS'), official letter, 20 March 2018.
- Ofwat, 2018c, Putting the sector back in balance: Consultation on proposals for PR19 business plans. April 2018.
- Ofwat, 2018d, Putting the sector back in balance – summary of Ofwat's decision on issues for PR19 business plans. July 2018.
- Ofwat, 2017, Monitoring of Financial Resilience 2017 Report, November 2017. Online <https://www.ofwat.gov.uk/wp-content/uploads/2017/11/Monitoring-financial-resilience-2017-Report.pdf> [accessed 17/05/18]
- Ofwat, 2017a, Monitoring of Financial Resilience 2017 Report, November 2017. Online <https://www.ofwat.gov.uk/wp-content/uploads/2017/11/Monitoring-financial-resilience-2017-Report.pdf> [accessed 17/05/18]
- Ofwat, 2017b, Resilience in the Round. September 2017. Online <https://www.ofwat.gov.uk/wp-content/uploads/2017/09/Resilience-in-the-Round-report.pdf> [Accessed 17/7/18]
- Ofwat, 2017c, Delivering Water 2020: Our final methodology for the 2019 price review. Online <https://www.ofwat.gov.uk/publication/delivering-water-2020-final-methodology-2019-price-review/> [Accessed 17/7/18]
- Ofwat, 2017d, Company monitoring framework. 2017 assessment. Individual company report – Dŵr Cymru. November 2017.
- Telegraph Newspaper. Valuable lesson of Welsh Water group. 9 October 2001. Online <https://www.telegraph.co.uk/finance/2736812/Valuable-lesson-of-Welsh-water-group.html> [accessed 17/05/18]
- Welsh Water, 2014, Emergency Response Manual, Section 9, Lessons Learned & good Practice, November 2014.
- Welsh Water, 2018a, Welsh Water 2050. Online <https://www.dwrcymru.com/en/Company-Information/Business-Planning/Welsh-Water-2050.aspx> [accessed 14/05/18]
- Welsh Water, 2018b, Acceptability of Water Business Plan, April 2018.
- Welsh Water, 2018c, Draft Water Resources Management Plan 2019, March 2018
- Welsh Water, 2018d, WaterSource18. Online <https://www.dwrcymru.com/en/WaterSource/WaterSource18-conference.aspx> [accessed 16/05/18]
- Welsh Water, 2018e, Methodology Statement (Procedures) F3b – Asset Resilience – Ofwat, April 2018.
- Welsh Water, 2018f, Reservoir Safety Business case, April 2018.
- Welsh Water, 2018g, Customer Engagement – Environment, March 2018.
- Welsh Water, 2018h, Fast Facts, Online, <https://www.dwrcymru.com/en/Media-Centre/Fast-Facts.aspx> [Accessed 01/06/18]
- Welsh Water, 2018i, Education, Online <https://www.dwrcymru.com/en/Community/Education.aspx> [accessed 01/06/18]

## Bibliography

- Welsh Water, 2018j, Schools Education Programme, <https://www.dwrcymru.com/en/Environment/Water-Framework-Directive-Projects/River-Schools-Education-Programme.aspx> [Accessed 01/06/18]
- Welsh Water, 2018k, Welsh Language Scheme, Online <https://www.dwrcymru.com/en/Company-Information/Dwr-Cymru-Welsh-Water/Welsh-Language-Scheme.aspx> [accessed 01/06/18]
- Welsh Water, 2018l, DCWW Smart Strategy v7.0 Final, 2018
- Welsh Water, 2018m, Gender Pay Gap, report 2018. Online <https://gender-pay-gap.service.gov.uk/viewing/employer-details?e=zEO2b9M5oZLR7gIIAGR1ig%21%21> [accessed 05/06/18]
- Welsh Water 2018n, PR19 Business Plan Executive Summary (confidential draft)
- Welsh Water 2018o, Glas Cymru, online <https://dwrcymru.com/en/Company-Information/Glas-Cymru.aspx> [accessed 15/06/18]
- Welsh Water, 2018p, People Dashboard.
- Welsh Water 2018q, Attracting New Talent/ Employer of Choice
- Welsh Water, 2018r, Welsh Water Code of Conduct
- Welsh Water 2018s, Creating an inclusive workforce
- Welsh Water, 2018t, H&S Team Business Plan 2018-19, 20<sup>th</sup> February 2018.
- Welsh Water, 2018u, Equality, Diversity and Inclusivity Strategy 2018 – 2025.
- Welsh Water, 2018v, PR19 Resilience in the Round overview, September 2018.
- Welsh Water, 2017a, Asset Management Policy Statement, October 2017. Online [https://www.dwrcymru.com/en/Reading\\_Room\\_Library/IMS.aspx](https://www.dwrcymru.com/en/Reading_Room_Library/IMS.aspx) [accessed 16/05/18]
- Welsh Water, 2017b, Customer Service Expectations customer engagement, March 2017.
- Welsh Water, 2017c, Welsh Water Consultation, 2017 Summer Consultation, summary report, 6<sup>th</sup> October 2017.
- Welsh Water, 2017d, Welsh Water 2050: customer response to long term strategy, Research debrief, blue marble, 10<sup>th</sup> July 2017.
- Welsh Water, 2017e, DCWW Youth Board Interim report, July 2017.
- Welsh Water, 2017f, Making time for nature, online <http://dwrcymru.co.uk/~media/Files/Environment/2017/Biodiversity%20booklet%20-%20Final%20English%20-%20Single%20pages.ashx> [accessed 05/06/18]
- Welsh Water et al., 2017g, Safety Climate Tool Report, 3<sup>rd</sup> April 2017.
- Welsh Water, 2017h, Information and Systems Security Policy.
- Welsh Water, 2017i, DCWW IT Strategy 2025, Business Information Services, April 2017
- Welsh Water, 2017j, Annual H&S Report and Strategy Review, 5<sup>th</sup> May 2017.
- Welsh Water, n.a.a, SMART Strategy Delivery Roadmap.
- Welsh Water, 2016a, Professional Development Policy, Issue 6, 21<sup>st</sup> June 2016.
- Welsh Water, 2013, Talent and Development Guidance, Issue 04, 14<sup>th</sup> May 2013.
- Welsh Water, 2015, Welsh Water AMP 6 Health and Safety Strategy, April 2015.
- Welsh Water, n.a.b, Employee Health and Wellbeing (Stress/pressure management) Policy.
- Welsh Water, n.a.c, Q3 Health, Safety & Wellbeing Report, -October – December 2017.
- Welsh Water, 2016b, Resilience Research, Qualitative Debrief, October 2016.
- Welsh Water & ORC, 2017., Employee Engagement Survey 2017 and 2018 Employee Engagement Action Plan.
- Welsh Water, n.a.d, Household retail plan.
- Welsh Water, 2018u, Innovation proposals for PR19, June 2018
- Welsh Water, 2018v, Alliance Innovation Strategy, July 2018

## Appendix D

### Welsh Water's Resilience Wheel and assessment approach: framework

## Appendix D: Welsh Water's Resilience Wheel and assessment approach

### Framework: people

Theme	Sub-theme	What leading looks like
Protecting public health	<b>Safeguard water quality</b>	Water quality at taps meets all legislative quality requirements and has excellent taste and clarity. Water treatment works are adaptive to changing contaminants in the water and upstream interventions should be utilised to improve and maintain high quality water.
	<b>Provide reliable service for customers</b>	Company operations focus on providing a continuity of service to customers and avoiding critical service failures, such as supply interruptions and internal sewer flooding. Water supply interruptions only occur in the most unlikely situations with redundancy plans being built into all critical aspects of the supply network and contingency plans in case of extreme disruptions. There are long-term strategies to ensure that the system has sufficient capacity to cope with future conditions. Mechanisms should be in place to regularly review and update all plans and data. It also takes into account the different needs of customers, particularly those who are vulnerable.
	<b>Foster a first rate culture of health and safety and well-being</b>	The company has reliable and robust plans for health, safety and wellbeing which will make significant and measurable improvements to the lives of the workforce. There is a good health, safety and wellbeing culture within the organisation with reporting of near misses and positive interventions as well as regular health and safety stand-down days and a focus on public health and staff health and wellbeing. Leaders and managers should have suitable training on health and safety. There is a range of KPIs linked to their major accident hazards. The KPIs should be used to measure actions and activities carried out to ensure that the critical controls required to prevent serious injuries and incidents of ill health are in place and that these KPIs are monitored frequently (weekly/monthly) to ensure they are maintained.
Meeting customer expectations	<b>Ensure inclusive and proactive community engagement and co-creation</b>	The company has a clear two-way dialogue with customers to ensure that customers are included and to improve transparency, cooperation and collaboration on current performance and future direction for the business. There is an extensive programme of inclusive, long-term community engagement at all local scales, which occurs regularly and is monitored. Customer policy and practices are established to meet the needs of customers in vulnerable circumstances. The company aims to establish trust, confidence and legitimacy. Customers and the community also feel that they are part of the planning process and are kept informed. Their feedback is used to continually update strategies.
	<b>Engage proactively in customer and community education</b>	The company undertakes activities which have wider benefits to the communities that they serve. Customer and community education is comprehensive and proactively undertaken. It is based on best available understanding of behaviour change, psychology and customer insight. Information is available in suitable formats and is distributed effectively to all customers.
	<b>Share information accurately and fast</b>	Information is presented in multiple ways so that it is understandable by all and is shared in a co-ordinated process via suitable pathways internally, with stakeholders and with customers, as appropriate. This information should include, at a minimum, any service issues, service updates, finance and how customers money is invested. All appropriate real time data and information is shared accurately and quickly with regulators and partners. Where suitable, information and data is also available in real-time, with the data sets being easily downloadable.
	<b>Collaborate and engage with stakeholders</b>	Communication with regulators, partners and stakeholders is effective and regularly undertaken which includes leadership on the sharing of innovative ideas. Inclusive engagement and collaboration with stakeholders and other utilities is required across the business and there are mechanisms in place to ensure their views are recorded and disseminated. Collaboration is demonstrated through multi-agency participation with tangible outputs that improve the resilience to customers and the business.



## Appendix D: Welsh Water's Resilience Wheel and assessment approach

### Framework: people

Theme	Sub-theme	What leading looks like
Working as an integrated team	<b>Provide excellent training and development for all staff</b>	The training and development programme is comprehensive and all staff should be engaged in continuous improvement. The training programmes are highly customised to an individual's ambitions and are updated and reviewed regularly. They are developed and delivered by a mix of internal and external experts and partners and are based on future need and skills gaps, not just the immediate need.
	<b>Foster a diverse, inclusive culture</b>	The culture promoted by the board is consistent across all offices and there are regular events to promote it. The staff feel valued, fairly treated and able to perform at their best. They should also share a strong sense of the inclusive culture and have a strong sense of pride in their work. The company encourages diversity through employee network groups and leadership role models.
	<b>Assure suitable recruitment, remuneration and benefits</b>	The company identifies and plans to fulfil the requirements of their future workforce. The company attracts and is seen as the first choice for highly skilled individuals and have a low staff turnover. The staff should also feel that the remuneration and benefits are right for the work that they do.
	<b>Establish a plan for career progression and succession</b>	Every employee should have a bespoke career progression plan which is reviewed regularly and used as a basis for decision making when assigning new projects and roles as well as providing training. The staff feel like they have control over their career and can see that they are progressing accordingly. They ensure they have workforce continuity plans to identify skills gaps between their current and future workforce. Ensuring that these can be filled through training and development and succession planning. All knowledge and skills are effectively captured before people move on or retire so that other can effectively take over.
	<b>Establish a collaborative and adaptive organisational culture</b>	The company has an organisational culture that puts people resilience at the heart of all that they do. All employees understand the overarching vision and resilience objectives of the company and how their individual roles feed into and facilitate this, working together across boundaries in the service of customers and the community. Employees feel engaged in the work the company undertakes. Learning, collaboration and flexibility to future change is key and evident in short medium and long term management, no simply in one-off innovations and in response to major 'events'. There is effective internal collaboration and communication between all of the teams.

## Appendix D: Welsh Water's Resilience Wheel and assessment approach

### Framework: Infrastructure and environment

Theme	Sub-theme	What leading looks like
Implementing effective asset management systems	<b>Use smart and integrated asset information systems</b>	All systems are smart, integrated and use real-time data, so that any changes in conditions can be accounted for. They have redundancy and adaptability as core requirements and network models should exist for all catchments and should be dynamically linked to a central asset information database that is continually updated.
	<b>Robust long-term resource monitoring and management planning</b>	Long-term water resource management planning and drought planning has been integrated into business planning to facilitate long term sustainable growth. This plan is reflective, and reviewed and updated regularly. Furthermore there should be mechanisms in place which ensure that all current and future programmes align with this strategy. Plans are produced collaboratively with the EA and regional planning groups to ensure best value for customers with respect to cross-company, regional and national supply options.
	<b>Robust long-term wastewater planning</b>	Wastewater planning is undertaken for the long term enabling sustainable growth in the region without impacting existing customers. Wastewater plans are developed with stakeholders and integrated into their business plans. They focus on critical service failures such as internal sewer flooding and pollution incidents.
	<b>Ensure resourceful asset management and a risk-based approach to asset health</b>	A comprehensive assessment of asset risk has been undertaken, including long-term low-likelihood risks. There is detailed and accurate information on the state and health of assets, the way they are configured and the way they are managed and operated. All asset management plans are long-term, redundant and resourceful. Furthermore, resilience and the resilience value of an asset is considered and is a driving force in all decisions made throughout the lifecycle of an asset. There is a region wide asset strategy which is adaptive, regularly reviewed and considers changing requirements in the long-term. They follow best practice for asset management, e.g. ISO 55000. Suitable response and recovery plans are in place and are regularly tested and updated as required by each asset. Focus is on criticality, protecting customers and the natural environment from exposure to known risks, and reducing vulnerability to future uncertainties.
	<b>Maintain and enhance physical and cyber security</b>	Regular reviews of security systems efficiency are carried out for both physical and cyber security. At the same time the security strategies and designs are adapted regularly, based on horizon scanning, lessons learned and as new threats become clear.

## Appendix D: Welsh Water's Resilience Wheel and assessment approach

### Framework: Infrastructure and environment

Theme	Sub-theme	What leading looks like
Safeguarding and enhancing the environment	<b>Minimise environmental pollution</b>	The value of the environment and ecosystem services is integral to all investment decisions. A key aim of works is to reduce environmental pollution based on the capacity of the environment to process contaminants at a location by location scale. The impact that the company has on the environmental baseline is understood for the water, air, soil environments, as well as biodiversity and climate. Mitigations are in place to minimise this impact.
	<b>Institute integrated catchment management and sustainable stewardship of ecosystems</b>	Work to improve resilience of ecosystems and biodiversity is in progress. Integrated catchment management is core to all work undertaken and viewed as a long-term strategy for ensuring the resources are there for future generations. Key components of the companies work in this field is close partnership working, as well as implementing ecosystem stewardship measures. Company goals are aligned with key partners. Approaches considered may include catchment management to improve raw water quality, and blue-green infrastructure to manage storm water and reduce flooding and pollution incidents.
	<b>Establish and use widespread environmental monitoring</b>	The environmental baseline is clearly understood, monitored and updated. Data is collected as relevant to the business and the environment it operates in, which may include marine and terrestrial ecology, air and water quality, groundwater levels, surface water flows, landscape effects, noise and vibration and the historic environment. Data is accurate, and where appropriate, accessible in real-time and linked to automated control systems that are adaptable and act to maintain good environmental conditions at all times. It should, where suitable, be linked to predictive models to inform long-term and short term strategies.
	<b>Consider environmental impacts in design, construction and operation</b>	Environmental constraints, enhancements and ecosystem services are considered at all stages of every project. Data on the impact to marine and terrestrial ecology, air and water quality, landscape effects, noise and vibration and the historic environment is key role to the decision making process. All investment considers future trends (including climate change and other hazards and risks) and include a number of review points where the environmental impacts and ecosystem services are re-assessed.
Delivering sustainable energy and resources	<b>Secure sustainable abstraction and leakage</b>	Ensuring sustainable abstraction is standard for all water sources. Environmental flow is understood and maintained in all river sources. Aquifer levels fluctuate within acceptable bounds and do not show a long-term downward trend. Leakage volumes are low and there are targets and processes to minimises leakages, outages and sewerage leakages further.
	<b>Ensure sustainable resource use and energy provision</b>	The impact of energy and resource use is well understood. Plans are in progress to significantly reduce demand for all resources, both by customers and within the supply network, now and long term. Control and security of supply is achieved partly through company owned renewable energy sources, energy storage and effective use of resources (e.g. sludge). A circular economy approach is taken to all resource use. Where appropriate energy produced is sold to others.
	<b>Develop a robust and flexible supply chain</b>	The impact of supply chains on operations is considered for both physical and skills resources. Supply chains are diverse, flexible and competitive to deliver the best outcomes for their customers. There are suitable internal processes to regularly review and adjust the resilience of supply chains. Investment is smoothed to avoid negative boom-bust impacts (related to AMP cycles) on suppliers and local SMEs are supported where appropriate.

## Appendix D: Welsh Water's Resilience Wheel and assessment approach

### Framework: Finance and governance

Theme	Sub-theme	What leading looks like
Ensuring robust finances and benefits to the economy	<b>Sustainable long term financial planning</b>	<p>The company is looking forward 25+ years, with investment and expenditure plans linked to the strategic direction of the company. These are regularly reviewed and tested. Base operating and maintenance expenditure together with any additional enhancement or replacement expenditure to meet customer and regulatory requirements have been identified on a year-by-year basis in the short to medium term and AMP by AMP basis for the longer term. The company has an excellent understanding of the current and future predicted condition and performance of all its assets. All new investment is informed by horizon scanning.</p>
	<b>Secure long-term financial viability</b>	<p>The Directors review the long-term viability of the company as an extension of their business planning process, and by their actions retain a strong investment grade rating for the company (ideally S&amp;P equivalent <math>\geq</math> 'BBB+' Stable Outlook). To do this the company:</p> <ul style="list-style-type: none"> <li>• has financial systems to accurately project planned Opex, Maintenance and Capex expenditure in each AMP;</li> <li>• has access to sufficient additional liquidity (cash or access to cash) in the event of unforeseen events or failures;</li> <li>• publicly reports in accounts look-forward rolling financial viability statements for at least five years based on long-term scanning spanning at least two AMPs, regularly stress testing the company to meaningful shocks (e.g. impact of change in inflation, major wastewater event, terrorism/ cybersecurity incident, failure to accurately predict Opex costs and future Capex costs, etc.), including the Ofwat July 2018 stress tests;</li> <li>• to accommodate stress tests and scenario analysis (e.g. the Ofwat July 2018 stress tests) has determined appropriate gearing levels and appropriate use of instruments such as inflation-linked debt; and</li> <li>• has appropriate insurance policies and cover.</li> </ul>
	<b>Understand and value natural and social capital</b>	<p>The natural environment valued as a vital resource and is protected and used across the network. Wider benefits in terms of ecosystem services is recognised. Value is given to social and environmental services and benefits, which is integrated into decision making throughout the lifecycles of a project and supported by senior leadership.</p>
	<b>Develop accessible and robust financial monitoring and reporting</b>	<p>The company has appropriate measures to monitor and confirm the company's long-term viability, which goes beyond AMP cycles to track trends in maintenance programmes, climate change and demographic changes, etc. These measures are supplemented by regular sensitivity tests and scenario testing. Such information is recorded and reported routinely at Board level, with clear criteria for when material divergences from expected plans need to be discussed and actioned.</p>
	<b>Protect finances for the regulated business</b>	<p>Transparency and inclusiveness is ensured through public reporting on financial and annual performance (via the annual reports and APRs). This uses customer focused language, (e.g. use of historical taxable losses to boost profits). Bills are easy to understand with visuals showing where customers water bills go, and how it minimises leakages, outages and sewerage leakages. Corporate, financing and tax structures are transparent and easy to understand.</p> <p>The company has appropriate measures for ring fencing finances for regulated activities to protect the interests of customers. Where the company has non-regulated activities, these are managed appropriately so they do not risk the financing of regulated activities. The company maintains flexibility to finance regulated company activities in the event of shocks to the group finances, evidenced by results from stress tests, spare cash reserves, liquidity, etc.</p>
Providing affordability and value for money	<b>Safeguard long-term progressive customer dividend</b>	<p>Any savings that the company makes are passed onto the customer through customer dividends. Investment also helps to achieve a wider resilience dividend, providing wider benefits across the business, customers and the environment. There is a strategy to continue to deliver this in the long-term.</p>
	<b>Ensure affordability and value throughout the business</b>	<p>There are systems and a business culture that capture new and innovative approaches to improve efficiency of projects, with a view to improving affordability for customers and the quality of customer services. This is reflected in high customer service and satisfaction scores.</p>
	<b>Develop innovative and inclusive collection methods</b>	<p>The company recognises that their customers can experience vulnerability in different ways in different periods of their life. Extensive social tariffs have been rolled out. There is an effective process to allow all customers to pay outstanding bills easily.</p>

## Appendix D: Welsh Water's Resilience Wheel and assessment approach

### Framework: Finance and governance

Theme	Sub-theme	What leading looks like
Delivering sustainable energy and resources	<b>Develop and promote a long-term organisational strategy</b>	There is a clear company vision which is well communicated and is recognised by with all, both internally and externally. There is a comprehensive long-term (30 year) organisational strategy, with policies and programmes to provide effective leadership which respond to potential future stresses and uncertainties. All plans and decisions are based on how they will work towards this strategy. Customers should also be able to clearly understand and share the business values.
	<b>Effective governance and assurance processes</b>	The company has reliable and well disseminated processes, roles, governance and reporting covering all aspects of the business. There is a clear process for assurance, approval and board sign-off.
	<b>Develop effective business continuity planning</b>	There is an all hazards approach to resilience planning linked to the National Risk Register and the likely impact on service to customers. A business continuity plan is in place to prepare for, respond to and recover from the potential impact. This is shared with staff and partners, and everyone should be clear on their roles in an emergency situation. This plan and the associated controls are regularly trained and exercised. All critical assets have emergency response plans and all critical teams are able to recover to minimise impact on service. These approaches follow recognised best practice as in ISO 22301.
	<b>Align all actions with local, national and international policy and legislation</b>	There is one clear and integrated strategy that is co-ordinated with national policy, legislation and regulatory guidance, whilst also drawing on global best practice. Only projects that follow this strategy and achieve the vision are undertaken.
	<b>Create space for innovation and horizon scanning</b>	Research, both internal and in collaboration with external partners is a key part of the business. Work on innovation projects is encouraged with time, funding and the support of the company's leaders. Furthermore, customers have an input into decision making for innovation. All stages of innovation are considered from horizon scanning and definition through to delivery and dissemination. Plans, strategies and actions are all based on the outcome of comprehensive and robust horizon scanning which takes into account future shocks and stresses that may impact areas of the business. Horizon scanning is regularly reviewed and informs plans and programmes across the business.



# Appendix E

## Disclaimer

## Disclaimer

This report has been prepared specifically for and under the instructions of Dŵr Cymru Cyfyngedig.

This report may be provided to third parties solely to inform any such person that our report has been prepared and to make them aware of its substance but not for the purposes of reliance. No third party is entitled to rely on this report unless and until they and we sign a reliance letter in the form attached to our appointment. We do not in any circumstances accept any responsibility or liability to retail investors whether via bond issue or otherwise and no such party is entitled to rely on this report.

In preparing this report we have relied on information provided by others and we do not accept responsibility for the accuracy of such information.

We emphasise that the forward-looking projections, forecasts, or estimates are based upon interpretations or assessments of available information at the time of writing. The realisation of the prospective financial information is dependent upon the continued validity of the assumptions on which it is based. Actual events frequently do not occur as expected, and the differences may be material. For this reason, we accept no responsibility for the realisation of any projection, forecast, opinion or estimate.

Findings are time-sensitive and relevant only to current conditions at the time of writing. We will not be under any obligation to update the report to address changes in facts or circumstances that occur after the date of our report that might materially affect the contents of the report or any of the conclusions set forth therein.

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