WRW RESPONSE TO OFWAT CONSULTATION ON LONG TERM DELIVERY STRATEGIES

Summary

Water Resources West welcomes Ofwat's proposals to further integrate regional planning, water resources management plans and other aspects of companies' business plans into long term delivery strategies. We think it is helpful to have common requirements to support the integration of these various aspects into the PR24 process. There are many similarities with our own thinking in relation to the use of common reference scenarios and adaptive planning. However we think that the definitions of the proposed scenarios require some change to protect customers' interests and align with government policy and the Water Resources Planning Guideline. It would also be helpful for Ofwat to provide more clarity on its expectations for companies to report their scenarios and adaptive plans. Such additions will aid the effective alignment and integration of regional plans, water resources management plans and PR24 business plans.

Background

Water Resources West is one of the five regional planning groups. We welcome opportunity to engage with this consultation and broadly welcome Ofwat's proposals for long term strategies, scenarios and adaptive planning. In our view the adoption of long-term strategies which embrace adaptive planning is exactly the kind of approach the water industry needs to adopt to meet growing challenges.

The proposed approach is similar to the work we have been doing within Water Resources West, developing common scenarios and using them to form adaptive plans that can be consistently reflected into our regional plan and water companies' Water Resources Management Plans (WRMPs). We welcome Ofwat's approach which will enable greater consistency in scenarios across all companies and regions and across different aspects of business plans beyond water resources.

While we are supportive of most aspects of Ofwat's proposals, in the following sections we set out some important aspects where either further clarity is required or change is needed to protect customers' interests and align with government policy and the Water Resources Planning Guideline.

Definitions of the Common Reference Scenarios

Water Resources West welcomes the proposed use of common reference scenarios and the four dimensions proposed. We intend to integrate the proposed Ofwat reference scenarios into our regional scenarios to support further integration between regional planning, water resources management plans and PR24 business plans. However there are some elements of the proposed definitions of reference scenarios which make this difficult. Our concerns principally relate to alignment with the Water Resources Planning Guideline and the resilience of public water supplies. There are also some other areas where further clarification would be helpful.

We understand from Ofwat's proposals that the low scenario should be the starting point for the core pathway, essentially protecting customers from unnecessary investment. This is welcomed, however care needs to be taken in the definition of the low scenario so that it does not either

- place unacceptable risk on customers, or

- conflict with statutory obligations, regulatory requirements or government policy.

As a regional group, our focus is naturally on water resources. A general principle should be that the low scenarios should be consistent with the requirements in the Water Resources Planning Guideline and the Guiding Principles from both Defra and the Welsh Government. If such an approach is not followed the resulting regulatory inconsistency would result in companies having to face difficult choices. They may need to decide between a non-compliant WRMP, a non-compliant business plan or inconsistencies between the two.

Our views on the specific scenarios are set out below.

Climate change

Representative Concentration Pathway (RCP)

Ofwat's proposed low climate change scenario is based on RCP2.6.

In June 2021, the Climate Change Committee published a technical report[1] of the 3rd UK climate change risk assessment. In this report, they state that the cumulative emissions associated with RCP4.5 and RCP6.0 are within the range consistent with current policies, and the RCP 8.5 emissions scenario is above the upper end of the current policies range, while RCP2.6 is below the lower end.

The Climate Action Tracker reports the expected climate change based on current global policies and actions this shows a range of 2.0 – 3.6 °C[2], very similar to that predicted under RCP6.0[3]. By contrast RCP2.6 is cooler than the optimistic scenario in the Climate Action Tracker as shown in Table 1.

Table 1. Warming above pre-industrial levels in 2100 from November 2021 edition of the Climate Action Tracker[2] and compared to the RCPs. Values in bold are used in the CAT Thermometer.

Temperature in °C		Lower bound	Median	Upper bound	Comparison to RCP[3]
Current Policy Projections	High	+2.3	+2.9	**+3.6**	**Very similar to RCP6.0:** best estimate 2.8°C, range 2.0-3.7
	Low	**+2.0**	+2.5	+3.2	
	Average		**+2.7**		
Optimistic scenario (net-zero pledges)		+1.5	+1.8	+2.4	**Warmer than RCP2.6:** best estimate 1.6°C, range 0.9-2.3

There is an academic debate about the appropriate scenario to use, especially for near term emissions (i.e. to 2050). However this centres largely on RCP8.5 versus medium scenarios like RCP6.0[4].

Another aspect to this is one of asymmetric risk. Under climate change the frequency and severity of drought events will increase. The consequence of planning to an overly optimistic scenario is to increase the risk of a

[1] Technical report, CCRA (June 2021)

[2] Climate Action Tracker, November 2021 edition, climateactiontracker.org/global/temperatures, accessed 16 December 2021.

[3] UKCP18 Guidance: Representative Concentration Pathways, Met Office, 2018

[4] See for example: "RCP8.5 tracks cumulative CO2 emissions" Christopher R. Schwalm, Spencer Glendon, Philip B. Duffy, Proceedings of the National Academy of Sciences Aug 2020, 117 (33) 19656-19657, DOI: 10.1073/pnas.2007117117; "RCP8.5 is a problematic scenario for near-term emissions" Zeke Hausfather, Glen P. Peters, Proceedings of the National Academy of Sciences Nov 2020, 117 (45) 27791-27792, DOI: 10.1073/pnas.2017124117; "Emissions – the 'business as usual' story is misleading" Zeke Hausfather & Glen P. Peters *Nature* **577**, 618-620 (2020), DOI: 10.1038/d41586-020-00177-3

loss of supply in drought events. A reliable water supply is consistently one of customers' highest priorities[5] and companies have a legal duty to make supplies available to persons who demand them[6]. By contrast the investment requirements to maintain water resources resilience under RCP6.0 climate change are expected to be modest compared to other policy requirements and are therefore affordable. Strong evidence of the asymmetry between the cost and risk, expressed as the cost of emergency response, is provided by the National Infrastructure Commission in "Preparing for a Drier Future"[7].

In Wales the Water Resources Planning Guideline requires either the use of RCP8.5, or the use of both RCP8.5 and RCP6.0 in an adaptive plan[8]. Use of RCP2.6 is not permitted under the guideline for the Welsh companies.

All this evidence points to RCP6.0 as being the most appropriate for a baseline (i.e. low) scenario. In our view both the Ofwat business planning requirements and the Water Resources Planning Guideline should be updated to make clear that RCP6.0 should be used as a starting point and that RCP8.5 should be used to inform adaptive plans. This should apply to companies in England as well as companies in Wales.

Percentile probability level

Ofwat propose that both the high and low scenarios use the UKCP18 probabilistic projections and the 50th percentile. We support the use of probabilistic projections, but think that using the 50th percentile would result in significant risk to public water supplies.

There are different UKCP18 products available and different ones are better suited to different purposes. For example, the probabilistic scenarios are not spatially coherent. Therefore for water resources assessments which require spatial coherence to understand patterns of drought risk across different sources, we use Regional Climate Models[9]. However Regional Climate Models are only available for RCP8.5 and include only a limited number of projections. By contrast the probabilistic projections cover a wide range (3,000 per time period and RCP) and all four RCPs, therefore allowing a broader understanding of risk. It is possible to combine the approaches and rescale the spatially coherent outputs of the RCP8.5 Regional Climate Models to align with probabilistic projections for a different RCP. This is the approach we have adopted and we support the use of probabilistic projections generally because of the broader understanding of risk that they facilitate.

Using the 50th percentile means that the impact of climate change is equally likely to be under-estimated as over-estimated. That is a 50% chance that the water resources system fails to cope with a future drought. The consequence of failure would be loss of supply to customers, e.g. standpipes or rota cuts. We refer back to the asymmetry of cost and risk, expressed as the cost of emergency response, from the National Infrastructure Commission's "Preparing for a Drier Future"[10] mentioned above.

Because the consequences of failure for customers is so high, water resources management plans use headroom to consider the range of uncertainties in plan components. In their 2019 plans, all Water Resources West companies used a 95th percentile at the start of the planning period and reduced this over time. This is typical of water companies in the UK. The Water Resources Planning Guideline states that companies should accept a higher level of risk further into the future. This is because as time progresses the uncertainties will reduce and they have time to adapt to any changes. The Water Resources Planning Guideline also references UKWIR methodologies, which provide detailed methods for assessing and determining the appropriate level of headroom.

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[5] Regional Plan Customer Research, March 2021 Report by Dan Young (Shed Research Consulting) and Frank Grimshaw (Fasttrack Squared) for Water Resources West

[6] Water Industry Act 1991, Section 37

[7] Preparing for a drier future, National Infrastructure Commission, 2018. Figure 9 shows £19bn costs to 2050 to achieve 1 in 500 resilience in a medium climate, low population scenario in England versus £34bn emergency response.

[8] Addendum on UKCP18 scenarios for use in Water Resources Management Plan 2024 (Wales), May 2021

[9] There was a national project to produce climate datasets for consistent use by all five regional water resources groups: Regional Climate Data Tools, Atkins, February 2021.

[10] Preparing for a drier future, National Infrastructure Commission, 2018. Figure 9 shows £19bn costs to 2050 to achieve 1 in 500 resilience in a medium climate, low population scenario in England versus £34bn emergency response.

Use of the 50th percentile by default would result in a deterioration in customers' supply resilience since climate change is already included in current plans at a significantly higher headroom percentile. For water resources, we therefore think that the headroom percentiles for the long term strategy and adaptive plan should be consistent with WRMP headroom and evidenced through that process. This should apply equally to climate change and other headroom components. This would ensure that customers' supplies remain resilient.

Technology

Ofwat's proposed definition of the technology scenario includes reference to metering and leakage technologies. Water resources plans and business plans need to take account of policy for reductions in leakage and per capita consumption. Our interpretation of the technology scenario is that it would affect the cost of achieving the policy targets, but not affect the target. Therefore the level of water demand in this scenario would remain unchanged. This approach preserves the policy target and avoids overlap between the demand and technology scenarios. It would be helpful if Ofwat could either confirm this interpretation or clarify how the technology scenario would interplay with the demand policies.

Demand

Ofwat's proposed definition of the demand scenario includes two main elements: (1) growth in population and properties and (2) the adoption of standards and regulations for water efficiency. We discuss these in turn below and add a third element which we believe is currently missing from the definition.

(1) Growth in population and properties

Requirements for reflecting growth of population and properties into demand forecasts are set in the Water Resources Planning Guideline (Section 6.3). There are differences between England and Wales.

In England the Guideline states that "Your planned property and population forecasts, and resulting supply, must not constrain planned growth". It also says that "you should base your forecast population and property figures on local plans published by the local council or unitary authority". In this guideline the word 'must' indicates the action is related to a statutory requirement. If a company does not follow a 'must' there is a high risk their plan is not legally compliant. 'Should' indicates that the Environment Agency, Ofwat and Natural Resources Wales believe this action is needed to produce an adequate plan.

For England, the Guideline does allow the prospect of an adaptive plan where there is a significant difference between plan based and ONS projections. However it notes limitations in the ONS projections and uses the term "may" rather than "must" or "should" – the implication being that this divergence from plan based projections will require strong evidence that the plan will still fulfil its obligations, which will need discussion with the regulators. This is the opposite approach to that set out in the present Ofwat consultation which indicates that the low scenario based on ONS projections should be the starting point for the core pathway.

In Wales the Guideline simply says that "you will need to base your forecast population and property figures on the latest local authority population and property projections published by the Welsh Government". The National Population Projection for Wales should only be used when looking at the population of Wales as a whole. This however has limited applicability to water resources investment because water resources cannot be shared across the whole of Wales. The Guideline states that "your plan should be built up of assessments undertaken at a water resource zone level".

In our view the Ofwat business planning requirements and / or the Water Resources Planning Guideline should be updated to make them consistent. Government policy towards planning for growth should be consistently interpreted in the two, otherwise the companies face a choice between having their WRMPs or their business plans challenged.

(2) Adoption of standards and regulations for water efficiency

The proposed low demand scenario includes the adoption by 2025 of building regulations and product standards to aid water efficiency. Our interpretation of this this is similar to the technology scenario referenced above. Water resources plans and business plans need to take account of policy for reductions in

leakage and per capita consumption. Therefore this element of the scenario would affect the cost of achieving the policy targets, but not affect the target. Therefore the level of water demand in this scenario would remain unchanged.

It would be helpful if Ofwat could either confirm this interpretation or clarify how the adoption of standards and regulations would interplay with the demand policies. If this interpretation is correct then it may be simpler to combine these elements with the technology scenario, e.g. to form a technology and standards scenario. In that way the technology and standards scenarios would explore the uncertainty in costs to achieve the demand policies. By contrast the demand scenario would look at the consequential costs of supply side investment required to manage different levels of demand.

(3) Inherent uncertainty in consumption forecasts

There are significant inherent uncertainties in both personal and non-household water use. These factors are to a large extent exogenous but are currently omitted from the proposed definitions of the demand scenarios.

Uncertainties in personal, per capita water use relate to a range of factors in society. Examples include:

- Length of time spent away from home e.g. due to work or holidays
- Personal hygiene habits, e.g. frequency of toilet flushing, taking showers or baths
- Uptake of water efficient appliances, linked to their availability and affordability
- Use of water for leisure activities, e.g. the popularity of gardening, hot tubs, domestic pools etc

Uncertainties in non-household consumption also relate to a wide range of factors, for example:

- The mix of business in the economy both specific (e.g. hairdressers versus retail) and large scale (e.g. manufacturing versus services)
- Overall economic growth
- The uptake of more water efficient processes within manufacturing industry
- Switching between direct abstraction and public water supply, influenced by relative costs and availability of abstraction
- The emergence of new water consuming sectors, e.g. hydrogen production by electrolysis

While some of these factors can be influenced by water companies to a certain extent, there is a very significant element which is exogenous. This potential for variation in consumption should be explored in scenarios.

The high scenario could be defined by reference to a simple high-level variation from the low scenario. For example in the recent inter-regional reconciliation exercise, the regional groups adopted a scenario which assumed that only half the policy reduction in PCC was achieved.

Environment

Ofwat's proposed definition of the environment scenario is based around the Environment Agency's scenarios for abstraction reduction. This is very narrow definition of the environment, even in the context of water resources. Other environmental requirements that can have material impacts on water resources availability include changing river support from reservoir discharges, intake screening, sediment management, barriers to fish migration or wider catchment issues. There are also a wide range of environmental aspects relating to water quality for both the water and wastewater services. The scenario definition could be broadened, with improved clarity on scenarios from environmental regulators, to cover factors beyond abstraction reduction. Further integration between the high and low scenarios and the long term WINEP would be helpful.

For abstraction reduction, we welcome the proposed use of the Enhanced Environmental Destination scenario as a high scenario. As a regional group we are already working with this as a high scenario.

In our view however, the BAU Environmental Destination scenario is a very stretching scenario and is unsuitable for use as a low scenario. The BAU scenario is relatively close to the Enhanced scenario for our

region[11] and goes beyond current government policy in a number of ways. The BAU scenario is a technical scenario based on an assumption that there is a fixed percentage of flow that needs to be protected in a changing climate. It does not reflect other aspects of WFD or government policy.

Reasons for not using the BAU scenario as the low scenario include:

- It is based on climate scenario AFIXK which is one of the driest scenarios in the Future Flows Hydrology based on UKCP09. It corresponds to a 3.90°C climate sensitivity[12] which is at the upper end of the range estimated by the IPCC
- The underlying flow and abstraction data is based on a snapshot from the EA's Water Resources GIS system and therefore doesn't include the benefit of recent or planned AMP7 investments.
- It does not include local intelligence, results of ongoing WINEP investigations or catchment scale modelling to identify ecological needs
- It assumes abstraction reduction is the only possible solution
- Abstraction reductions are built-up from all water bodies in the dataset without further assessment, e.g. there is no consideration of cost / benefit or disproportionate cost tests
- It is more stretching than the 90% of surface water bodies and 77% of groundwater bodies targeted in the Government's 25 year environment plan.

We propose that a suitable alternative low scenario for abstraction should be based on a continuation of delivering only currently known legal requirements. That is the traditional WINEP / NEP requirements for delivering cost effective improvements and preventing WFD status deterioration.

Reporting scenarios and adaptive plans

It is not yet clear how Ofwat see the common scenarios being combined and reported on. The consultation talks about eight scenarios but we cannot easily identify eight scenarios. There are four dimensions to the proposed common scenarios, each with a high and low component. All combinations of these factors represent plausible alternative futures. Therefore in traditional scenario analysis these would be combined to give $2^4 = 16$ scenarios as shown in Table 2:

Table 2. The scenarios implied by Ofwat's use of four dimensions, each with a high (H) and low (L) component.

Scenario	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Climate	L	H	L	L	L	H	H	H	L	L	L	H	H	H	L	H
Technology	L	L	H	L	L	H	L	L	H	H	L	H	H	L	H	H
Demand	L	L	L	H	L	L	H	L	H	L	H	H	L	H	H	H
Environment	L	L	L	L	H	L	L	H	L	H	H	L	H	H	H	H

It may be that the high scenarios are not intended to be combined, which would limit the assessment to the first five scenarios in the table. There is a trade-off here. Fewer scenarios reduce the reporting burden and make it easier to engage with and understand the evidence. More scenarios allow for a more comprehensive understanding of the risks and the degree that plans may need to adapt.

We suggest the following simplifications could be made to balance these factors

- Assume the technology scenario is explored independently of the others, so that the only high technology scenario reported is scenario 3 in our table above

[11] For Water Resources West the difference between the two scenarios is 63 Ml/d, compared to a total demand of over 4,400 Ml/d (from our Reconciliation Inputs, August 2021).

[12] Prudhomme, Christel & Dadson, Simon & Morris, D. & Williamson, J. & Goodsell, G. & Crooks, S. & Boelee, Leonore & Davies, H. & Buys, G. & Lafon, Thomas & Watts, G.. (2012). Future Flows Climate: An ensemble of 1-km climate change projections for hydrological application in Great Britain. Earth System Science Data. 4. 143-DOI: 148. 10.5194/essd-4-143-2012. Table 1.

- Assume that scenarios which combine high demand and high environment are infeasible, ruling out scenarios 11, 14, 15 and 16 in the table.

This would leave seven plausible scenarios as follows in Table 3:

Table 3. Shorter list of scenarios proposed by Water Resources West.

Scenario	1	2	3	4	5	7	8
Climate	L	H	L	L	L	H	H
Technology	L	L	H	L	L	L	L
Demand	L	L	L	H	L	H	L
Environment	L	L	L	L	H	L	H

There is also a distinction to be made between reporting scenarios and reporting pathways in adaptive plans. Some pathways in an adaptive plan may be robust to multiple scenarios and therefore you would typically expect there to be fewer pathways than scenarios. Our interpretation is that Ofwat will ask companies to report business plan tables for the pathways rather than the scenarios, and that the number of pathways will be optional. The link between the pathways and scenarios should then be explained in the long term strategy document.

It would be helpful for Ofwat to clarify these points.

Conclusion

We have set out a number of proposed changes to protect customers, avoid inconsistencies in the regulatory processes and clarify the requirements. Such changes will aid the effective alignment and integration of regional plans, water resources management plans and PR24 business plans. We would be happy to discuss any aspect of our response with the Ofwat team if this would be helpful.