

Introduction and Purpose of this Slide Deck

In November 2021 Ofwat published a consultation document setting out their expectations for what companies should include in their long-term delivery strategies as part of the business plan submission for PR24. The document aims to inform the integration of long-term strategies into the price review process. It proposes a series of common requirements and sets out eight common 'reference scenarios' to help develop and assess the strategies and outlining expectations for wider scenario planning to address future uncertainty.

It follows publication of the government guidance on the strategic priorities for Ofwat in July 2021. Within that guidance the government expects the sector to plan, invest and operate to meet the needs of current & future customers, in a way which offers best value for money over the long-term. This will require water companies to shift towards long-term adaptive planning. The document identifies 4 strategic priorities:

- Protecting and enhancing the environment
- A resilient water sector
- Serving and protecting customers
- Driving markets to deliver for customers

These strategic priorities (and associated enablers) flow through into the Ofwat's PR24 consultation. Ofwat state: *Adaptive planning should be at the heart of the long-term delivery strategy. The future is inherently uncertain, and it is important that the strategy is flexible enough to cope with changes in circumstances so it is robust over time. To encourage an enduring shift towards long-term adaptive planning in the sector. We are keen that the quality of long-term delivery strategies has a material bearing on the outcomes of the price review process.*

As specialists in the development of software solutions which support **Adaptive Systems Planning** through the provision of rapid and bulk **Scenario Analysis**, BMA welcome the shift towards the use of Adaptive Planning, Adaptive Pathways and Common Reference Scenarios as a means of navigating the increasing uncertainty associated with long term planning processes within the utilities sector.

The purpose of this slide deck is to offer feedback in support of the consultation process and evolution of an effective regulatory framework for PR24 which is more appropriate to the context in which we all now operate.



Our Credentials



Our Context:

Conceptualised 2008, the 3 founders have over 50 years experience in Decision Science across multiple sectors.

Our Vision:

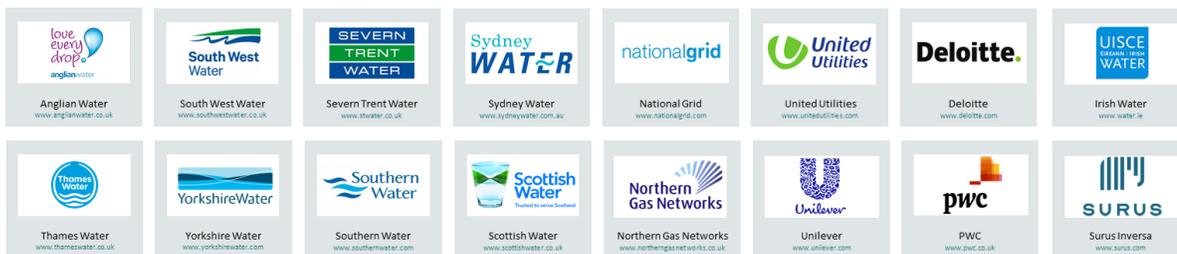
A technology capability enabling clients to make significantly better decisions around complex and important challenges:

- Optimising trade-offs across *silos*
- Bridging the *disconnect* between *strategy* and *operations*
- Driving the *convergence* of engineering and financial planning/modelling
- *Democratising* the use of advanced analytics with Clients through usable technology

Our Growth:

- 13yrs evolving the **Decisio platform**: framed as **Advanced Digital Business Twin** (ADBT)
- 10yrs active in the utility sector – engagements with 10/13 of the largest water utilities in UK/Ire
- Accelerated focus with clients in Energy, De-carbonisation & **Sustainability/ESG**
- 2020/21: Expanded team, **Patron** of the **Institute of Asset Management**, 1st Client in the **US**
- Passionate about innovation, passionate about driving value

Our Clients & Partners:



Our Capability:

Business Modelling Associates provide digital representations of complex business systems (Assets, Asset Connectivity and Business Context) using ADBTs.

Within an ever more volatile, uncertain, complex & ambiguous (VUCA) business environment, all organisations need to enhance their long-term planning capabilities.

Our ADBT solutions embrace complexity and uncertainty and are used by our Clients to run thousands of complex scenarios which inform both ongoing strategy development and strategy delivery in a living, iterative way.

Blending the principles of **Adaptive Planning** and **Systems Thinking**, ADBTs provide our Clients with a new **Adaptive Systems Planning** capability, empowering them to explore plausible complex futures in a way which has not been previously possible.

By employing **Elastic Cloud Services** the number and complexity of future scenarios which can be quickly developed and tested is enormous, empowering our Clients to:

- Develop resilient strategies, maximising the trade-off between risk and resilience
- Ensure inter-dependencies and knock-on effects from a change in one part of the business are fully accounted for across the whole value-chain
- Respond to shocks by rapidly re-optimising the plan to the next new optimal
- Provide unprecedented Board assurance for core business strategies.

The functionality provided by ADBTs include:

- Embedded financial evaluations
- Sensitivity and data criticality analyses
- Integrated carbon reduction & management
- Operational, tactical and strategic plans integrated across timeframes

Doubt is not a pleasant condition, but certainty is absurd.

Our Value Proposition

■ **Our Markets:** *Asset Intensive Industries*

- Utilities
- Energy & Renewables
- Mining & Commodities
- Infrastructure & Transport

■ **Our Technology:** *Advanced Digital Business Twins*

- Cloud Based with Unlimited Scalability
- Advanced Analytics
- Rapid Data Integration & Solution Configuration
- Intuitive & Collaborative User Experience
- Rich Visualisation

■ **Our Methodology:** *Top-Down-Whole System*

- Multiple & Nested Timeframes
- Interconnected, Multi-Constraint Analysis
- Asset Value Chain
- Evolving External Context

■ **Our Applications:** *Rapid Scenario Analysis*

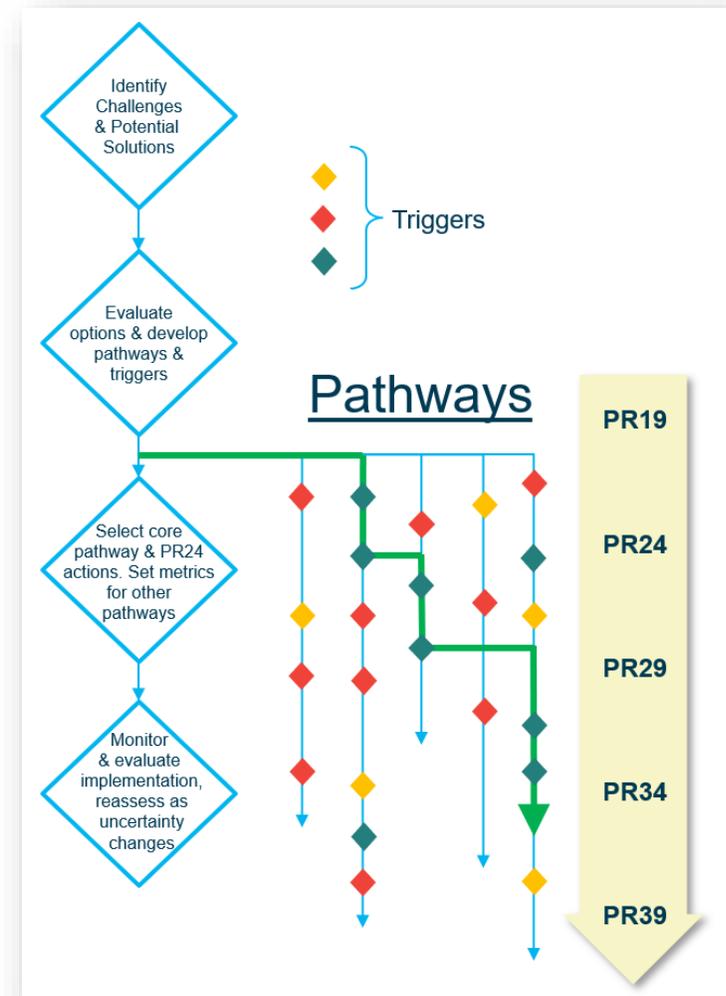
- Asset Network Design & Investment
- Performance Optimisation
- Uncertainty Analysis
- Carbon Management / Reduction
- ESG & Value Frameworks
- All applications supported by deep financials

■ **Client Capability:** *Adaptive Systems Planning*

- Next Generation Decision Support
- Leverages Subject Matter Expertise
- Board Level Assurance
- Rapid Time to Value

Headline Feedback

- BMA welcome an increased focus on the long term as the key theme for PR24 and the use of Scenario Analysis to develop Adaptive Pathways as an approach to strategic planning.
- This approach recognises the need for companies to build a capability that enables them to ‘course correct’ their plans through periods of volatility, uncertainty, complexity and ambiguity.
- The ability to consider multiple potential pathways, capable of responding to a larger range of plausible futures, and thereby provide substantial assurance for a 25-year strategy, marks a significant step forward from previous Price Review requirements where the Strategic Direction Statement was often ‘disconnected’ from the 5-year plan.
- Such an approach will require companies to develop new, rapid and bulk scenario management and analysis capabilities, not catered for by current portfolio investment solutions, typically focused on the optimisation of a 5-year programme.
- General advances in technology and planning & optimisation solutions across a number of sectors, mean tools are now available which enable such an approach, providing:
 - long-term optimisation and investment sequencing;
 - no- and low-regrets investments proposals;
 - long-term customer bill evaluation, ensuring fairness across generations;
 - automated bulk scenario management with rapid solve times;
 - detailed uncertainty and sensitivity analyses, enabling the stress testing and assurance of chosen pathways and associated triggers; and
 - asset system optimisation, ensuring the best possible asset composition and configuration over time, exploiting system headroom, exposing constraints and significantly reducing the risk of stranded assets.
- To help realise and exploit the benefits associated with this new approach, BMA have provided feedback in the following slides, structured around five key points.



Headline Feedback

- 1. A More Systemic Approach:** Ofwat should encourage companies to adopt a more holistic, systems-based approach to their strategic planning and decision-making processes, particularly within the context of increasing volatility, uncertainty, complexity and ambiguity. Such an approach recognises the inherent risks and opportunities associated with connected asset systems and is proven to deliver more resilient and cost beneficial outcomes in the longer term.
- 2. Building Adaptive [Systems] Planning Capability:** Ofwat should go beyond encouraging companies to embrace the principles of *Adaptive Planning* and seek evidence that they are building capability, ensuring *Adaptive Planning* is established within core strategic, tactical and connected operational planning processes. It is critical that *Adaptive Planning* becomes a core competency and is not simply seen as a mechanism to satisfy a Price Review process.
- 3. Broader Range of Scenarios:** Whilst the requirement to consider eight Common Reference Scenarios is a welcome first step, we commend Ofwat for encouraging companies to go beyond these scenarios and consider uncertainty, risks and opportunities of more specific relevance to individual companies. We would however like to see Ofwat encouraging companies to consider the eight Common Reference Scenarios in combination and also consider how scenarios are connected across different timeframes.
- 4. Adaptive Regulatory Frameworks:** Some sector challenges are so big that they will require more substantial disruption or indeed government policy changes affecting multiple sectors at the same time. Diversity of thinking will be required to enable different business models, new economic models, value frameworks, supply chains and market solutions. More and more collaborative, cross-silo, cross-boundary and cross-sector working will be required – many of the challenges we face are universal with solutions required by linking multiple sectors. We can no longer afford to look at solutions in isolation. How will Ofwat ensure these ‘mega-problems’ are considered, modelled and tackled through existing or new regulatory frameworks, particularly with regards to major cross-company or even cross-sector investments?
- 5. Informing Innovation:** Limited reference is made in the document to innovation, other than new innovation may drive a requirement to adapt a long-term strategy. Future uncertainty and gaps in current knowledge should not only be used to inform potential pathways and define associated triggers, uncertainty analysis should also be used to inform, prioritise and test innovation, associated benefits, costs, price points etc. This should in turn be used to stimulate the innovation community, the supply chain and inform Ofwat’s innovation programme.



1. A More Systemic Approach

- Ofwat should encourage companies to adopt a more holistic, systems-based approach to their strategic planning and decision-making processes, particularly within the context of increasing volatility, uncertainty, complexity and ambiguity (**VUCA**). Such an approach recognises the inherent risks and opportunities associated with connected asset systems and is proven to deliver more resilient and cost beneficial outcomes in the longer term.
- Adopting a systemic approach has widely recognised benefits when operating within an increasingly VUCA environment. In contrast to a more traditional systematic approach, by applying the principles of **Systems Thinking**, companies will build a deeper understanding of:
 - **The bigger picture:** Rather than considering specific events or components, problems would be framed as patterns and importantly, problems would be understood within their contexts.
 - **Both system components and inter-relationships:** feed-back and feed-forward loops and their time-lags require definition. Cause and effect relationships need to be captured and understood.
 - **Assumptions, which need to be identified, made explicit and tested within a systems context:** These are often inherent to the problem. How would changing assumptions affect the systemic outcomes? In particular, the sensitivity of the decision outcomes needs to be fully explored both in the short, medium and longer term, depending of course on the nature of the challenge.
 - **Dynamic aspects of the problem and associated perspectives:** Challenges which are volatile, uncertain, complex or ambiguous from one viewpoint may not be from another. The perspectives of different stakeholders need to be considered to identify broader causes and relationships.
 - **How mental models and current mindsets define current reality and expected futures:** The attitudes and expectations that we often unknowingly use to understand the world create filters for problems and their solutions. Inherent bias is always an issue, often exacerbated by organisational structure and dynamics which breed group think, received wisdom and tribal allegiances.
 - **How we tend to jump to conclusions:** Outcomes from systemic evaluations are often surprising and not necessarily intuitive.
- Adopting a systemic approach has a range of demonstrable and tangible benefits which include increased resilience and reduced cost. Both are achieved by fully understanding and exploiting the composition and inter-connectivity of complex asset systems, as well as how the systems fulfil their fundamental purpose. Understanding where headroom and constraints exist within a system, now or in the future, is a critical insight which should be used to guide investment and avoid stranded assets or unexploited capacity.
- The following case study demonstrates how a **Systemic** approach benefited Sydney Water in their 30-year investment programme by enabling a programme which delivered flat bills at reduced cost (-\$11Bn) by considering a dynamic asset system design and the optimal timing of investments across that 30-year view.

- The more volatile the world is, the more & faster things change.
- The more complex the world is, the harder it is to analyse.
- The more uncertain the world is, the harder it is to predict.
- The more ambiguous the world is, the harder it is to interpret.



- Making sense of VUCA largely centres on our ability to think in a **systemic** way, at odds with our natural approach which is to break up complex problems, create structure and linearity – in effect, adopt a **systematic** approach to complex problems.
- In the process we create bias & siloed thinking. This traditional approach is endemic in not only how we think, but how we structure ourselves, our teams and our processes. Not surprising then that we find it difficult to approach problems in an alternative way.



Case Study: Sydney Water 30-year Investment Plan

Challenge: Deliver required outputs & service standards whilst maintaining flat bills.

Starting Point:
Un-optimised
Baseline Plan
\$43Bn

Whole-System Approach

Combining water, wastewater & storm water systems, to holistically consider:

- **Dynamic** system design & configuration
- Incorporating new sites & assets

TOP-DOWN

-\$17Bn

Affordability & Service Enhancement Iterations

Iterative evaluation of top-down & bottom assessment, to:

- Consider the **optimal timing** of **all** investments & enhancements
- Whilst maintaining a **FLAT** Customer Bill impact over the period.

+\$6Bn

Risk Based Maintenance & Investment Model

Detailed asset maintenance & renewal programme within a **static** system design to:

- Define a risk-based asset health investment programme
- Consider requirements of existing assets & the overlap with growth & renewal.

-\$1.3Bn

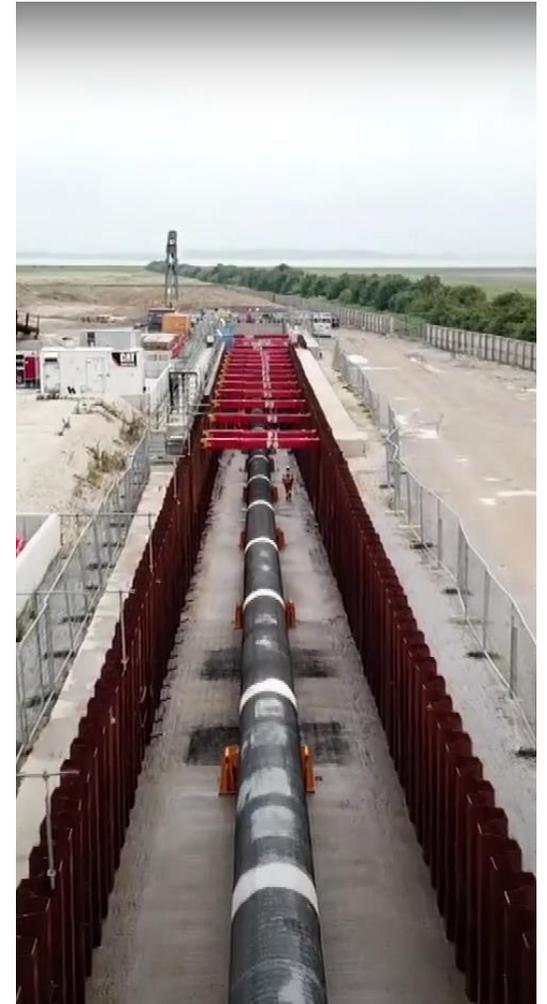
BOTTOM-UP

End Point:
Optimised
Whole City Plan
\$32Bn

Sydney Water supply water, wastewater, recycled water and some stormwater services to more than five million people in Greater Sydney and the Illawarra.

2. Building Adaptive [Systems] Planning Capability

- Ofwat should go beyond encouraging companies to embrace the principles of Adaptive Planning and seek evidence that they are building capability, ensuring Adaptive Planning is established within core strategic, tactical and where appropriate operational planning processes. It is critical that Adaptive Planning becomes a core competency and is not seen simply as a mechanism to satisfy a Price Review process.
- Ofwat should guard against being seen to promote Adaptive Planning as simply an activity which is only required as part of a Price Review Process. We do not believe that a lack of existing capability should be considered a constraint and one which should limit the ambition of companies to build Adaptive Planning capability as a core competency. Adaptive Planning has many benefits across multiple time and planning horizons and 'off-the-shelf' modelling solutions are available across all of the key price controls.
- Advances in optimisation technology provide huge opportunities for companies to accelerate their strategic understanding of likely future performance and which plausible futures they should focus attention on. Whilst the world is certainly more VUCA and the range of possible futures is infinite, the number of plausible futures is more manageable. Building a deeper appreciation of the criticality of those factors and parameters which can combine to materially affect longer term objectives is absolutely key.
- To become truly adaptive in their planning processes, in addition to computing power, companies need digital representations of their assets and the context in which those assets operate. The many plausible futures that need to be considered, even with just 8 common reference scenarios, will require the modelling of many complex iterations – large scale scenario analysis will be required. Adaptive Planning capabilities therefore need to be technology enabled, models need to be easily configurable and solve times need to be rapid.
- Furthermore, by encouraging Adaptive Planning processes to be systemic in nature, Ofwat will enable the type of benefits highlighted in the Sydney Water Case Study. The consideration of systemic risk and resilience becomes possible, often delivering radically different outcomes and insight than when considering the risk posed by the loss of individual assets.
- Such a capability provides additional benefits beyond strategic (and indeed tactical) planning processes, with operational applications associated with the rapid evaluation of system performance in the event of the unexpected loss of a critical asset.
- BMA have deployed a number of tactical Bio-Resource solutions within the UK Water Sector which have been used for precisely this purpose, enabling companies to mitigate the impact of unforeseen lost production capacity, quickly delivering the next new optimal plan; **Adaptive Systems Planning** in action.
- National Grid Gas Transmission provide a great example of where Adaptive Systems Planning is now established as a core competency, as demonstrated in the following Case Study and showcased in an ITN Production for the Institute of Asset Management ([Link](#)).



Feeder 9 Replacement
Justified through a systemic approach

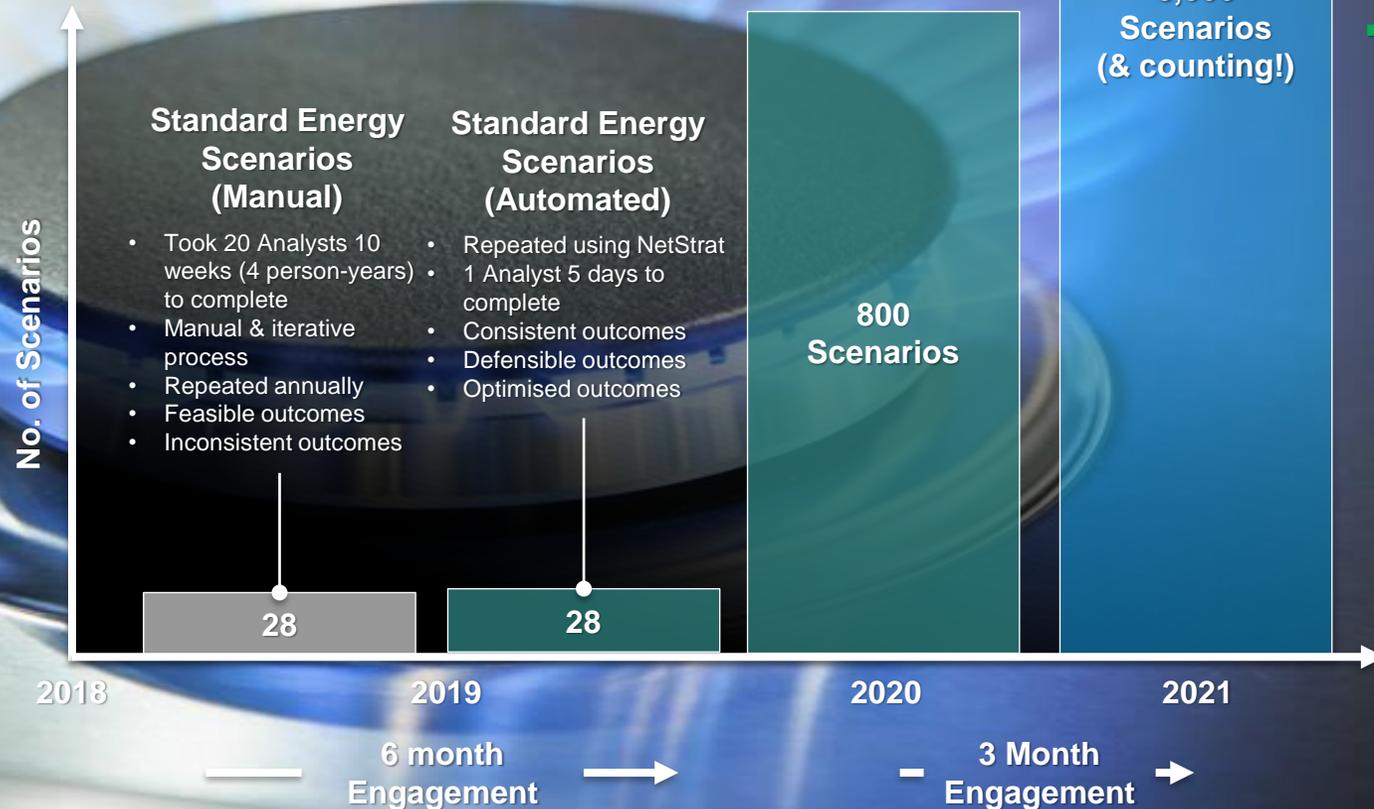
Case Study: National Grid Network Strategy (NetStrat)

Establishing a Scenario Management Capability

- Entire UK gas transmission infrastructure modelled, including 7,660km of pipeline, 24 compressor sites, 9 importation terminals and 8 storage sites.
- Solution blends network configuration, cost analysis & hydraulic modelling in single solve.
- Each solve considers 14,000,000,000 different possible solutions & configurations.
- Automatic pinch-point analysis identifies network constraints & reinforcement requirements
- Scenario analysis has already led to the decommissioning of 2 compressor sites

Growing the Capability

- Additional functionality to enhance the user experience.
- E.g. Clients can now rapidly add, remove and re-purpose assets within the model.
- Enhanced & broader scenario management capability .
- 2021 has seen a significant rise in the number of Scenarios being run by National Grid



Gas Transmission Challenges

- An increasingly **VUCA Future**
- Forecast 30% reduction in demand
- Regulatory pressure to close 30% of compressor sites (7 in total)
- Operational & capital cost pressure
- Net Zero targets & the supporting the **hydrogen** economy, whilst maintaining resilience
- **Scenario capability constrained by manual process**

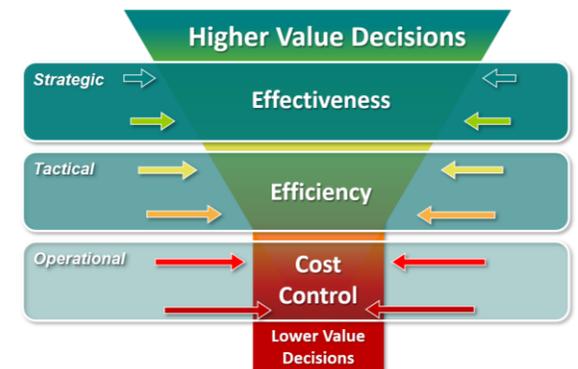


3. Broader Scenario Analysis

- Whilst the requirement to consider eight Common Reference Scenarios is a welcome first step, we commend Ofwat for encouraging companies to go beyond these scenarios and consider uncertainty, risks and opportunities of more specific relevance to individual companies. We would however like to see Ofwat encouraging companies to consider the eight Common Reference Scenarios in combination and also consider how scenarios are connected across different timeframes.
- If the ultimate goal is to build the most robust, defensible and flexible plans possible, the focus for companies should be about building capability. A key incentive for creating this capability is encouragement from the regulator to promote the benefits of going beyond the statutory minimum requirement to evaluate 8 Common Reference Scenarios.
- Bulk and rapid Scenario Analysis will be required to test assumptions, sensitivities and uncertainty across different timeframes and across different combinations of scenarios for the Common Reference Scenarios alone, and to do these well will require new capability for most companies. Extending the requirement beyond 'the eight' is therefore not, in our view, a significant ask.
- Once a capability is established, as can be seen in the National Grid Case Study, the scenario modelling possibilities are extensive. Of course, successfully completing thousands of scenarios is not an achievement in itself. Once a range of base scenarios are established (as is the case with the Common Reference Scenarios), it is the ability to explore how the parameters and assumptions that underpin those scenarios combine and vary across multiple dimensions that provides additional and often valuable insight and assurance.
- Such capability has the added benefit of enabling unparalleled access to complex problems for a range of Stakeholders, such as board members, special interest groups, regulators and individual customers, with the opportunity to explore, test, scrutinise and better understand the myriad of trade-offs that exist in delivering water and wastewater services for the long term.
- In our experience, linking scenarios across the planning horizons also provides additional internal company benefits. Operational **Plan-Do-Review** cycles focused on delivery often provide insight into data quality and criticality. Tactical planning processes, often focus on resourcing, seasonal, maintenance & investment optimisation activities, but also informing strategic risks and opportunities and changes to operational processes. Whilst strategic planning processes, tend to be linked to Price Reviews, should also be used at a tactical and operational level to identify and inform more practical implementation challenges. In simple terms, linking the planning horizons in this way enables downward governance and upward assurance for the planning process.
- By encouraging companies to extend the range of scenarios they consider, companies are far more likely to build what will become an essential capability, rather than focus on satisfying what could be viewed as the latest in a long procession of Price Review requirements. More importantly, it will support deeper insight into a much broader range of risks and opportunities, as well as facilitate a wider range of solutions and potential collaborations.
- The desire to bring together all strategic planning frameworks, such as DWMPs, WRMPs and WINEP Programmes, provides further justification for the adoption of a more systemic approach, recognising the significant trade-offs that exist between these strategies and the necessity to take a more holistic view across strategies and the scenarios that connect them.



Climate Change Risk Assessment (CCRA) report 7 Key Risks to UK Water Sector



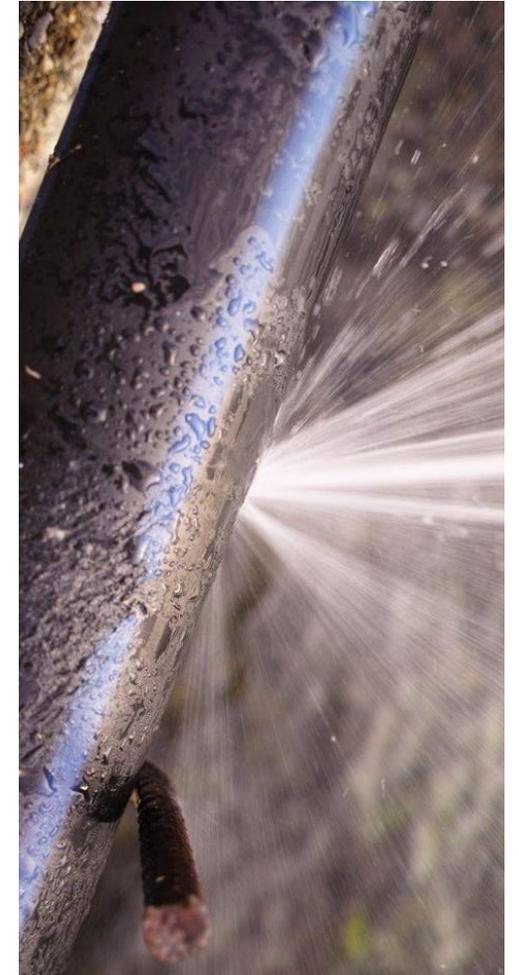
Value Funnel Nature & scale of value varies across the Planning Horizons

4. Adaptive Regulatory Frameworks

- Some sector challenges are so big that they will require more substantial disruption or indeed government policy changes affecting multiple sectors at the same time. Diversity of thinking will be required to enable different business models, new economic models, value frameworks, supply chains and market solutions. More and more collaborative, cross-silo, cross-boundary and cross-sector working will be required – many of the challenges we face are universal with solutions required by linking multiple sectors. We can no longer afford to look at solutions in isolation. How will Ofwat ensure these ‘mega-problems’ are considered, modelled and tackled through existing or new regulatory frameworks, particularly with regards major cross-company or even cross-sector investments?
- If the past 2 years have taught us anything, it is to expect the unexpected. Clearly, the context we all operate in has been radically impacted by COVID, affecting a number of the freedoms, services and societal norms we all took for granted. For water companies, changing demand patterns, staff availability, new working practices etc., are all issues they have had to manage through the crisis. Whilst the full social, health and economic impact is yet to be realised, the pandemic does also raise interesting questions as to whether the utility services we rely on have sufficient flexibility within the existing Regulatory Framework to respond to shocks such as these.
- As our name implies, Business Modelling Associates are long standing advocates of building business context into business modelling solutions. In the development of any business strategy, it is vitally important to consider the underlying context and assumptions upon which the strategy is founded. Failure to do so could easily render the strategy ineffective in the event of sudden policy change or the realisation of a significant risk. Conversely, the company might find itself needing to respond to new innovation, a global event or change in government policy, but is hampered by the existing 5-yearly regulatory cycle.
- BMA would certainly advocate the adoption of a more adaptive regulatory frameworks in parallel to the adoption of more adaptive strategic planning processes, particularly where existing regulatory constraints are found to be constraining or driving sub-optimal decisions within the existing Price Review period. We also challenge whether the current interim determination (IDOC) process provides sufficient flexibility for companies?
- Our key question and challenge is, does the development of a broad range of adaptive pathways with associated trigger points provide sufficient flexibility, if companies for example, choose to review / qualify pathways only at the end of the regulatory cycle. Is the pace of change within our collective business context now such that course corrections will be required more frequently? Agility and the pace of decision making will become ever more critical to success, and included in that argument, is the pace at which the regulatory context can change in order to maintain the balance between the needs of the customer and the needs of the company and investors.
- By 2024 It will be 35 years since privatisation. PR24 will represent the 7th Price Review. Whilst there have been undoubted improvements in the quality of the Regulatory Controls, the fundamental principles of the 5-yearly investment cycle are largely unchanged. Does a process which decides the performance standards and investment needs up to 6 years in advance for the entire sector, best represent the interests of all stakeholders, given the very dynamic (VUCA) context in which the sector now operates. In challenging companies to become more adaptive in their planning processes, is it not incumbent on Ofwat to consider how the regulatory framework should also adapt?
- BMA provide optimisation solutions which are sector agnostic. As well as utilities, our tools support decision making processes across multiple sectors such as Mining, Consumer Packaged Goods, Pharmaceuticals, Logistics and Manufacturing. Most of these sectors do not attract the scale of regulation required of a monopoly utility sector. We therefore understand the need for effective regulation and appreciate the complexity of the current regulatory process. However, like many non-utility organisations, effectiveness and efficiency is driven by the quality and pace of decisions. This is inextricably linked to the quality of planning and the decision-making processes. As already stated, we welcome Ofwat’s desire to encourage adaptive planning processes within the sector. However, we remain concerned that the benefits of doing so could be stifled by the existing regulatory process.
- We appreciate the size and significance of this challenge and we are not proposing alternatives here. However, given the wider challenges we all face, it is important to challenge where we feel your aspirations and longer-term objectives could be compromised.

5. Informing Innovation

- Limited reference is made in the document to innovation, other than new innovation may drive a requirement to adapt a long-term strategy. Future uncertainty and gaps in current knowledge should not only be used to inform potential pathways and define associated triggers, uncertainty and sensitivity analysis should also be used to inform, prioritise and test innovation, associated benefits, costs, price points etc. This should in turn be used to stimulate the innovation community, the supply chain and inform Ofwat's innovation programme.
- A supplementary benefit of bulk scenario analysis is the ability to automate and fully explore sensitivities, uncertainty and assumptions against key parameters being considered by the solution. This process provides a deeper appreciation of where gaps in knowledge reside and the extent to which they undermine the desired outcome. By combining the outputs from thousands of scenarios and collating the results within a single 'slider' dashboard, it is possible to quickly explore how variations in different parameters combine to deliver more or less likely outcomes, in effect running what would otherwise be very complex 'what-if' scenarios.
- In this way, critical dependencies and constraints are exposed, thereby providing insight into where the application of new technology or innovation would yield greatest dividends. Very often, when faced with seemingly impossible challenges, companies will throw all sorts of initiatives at a problem, without first understanding how the respective solutions combine to deliver an overall benefit. Leakage is an excellent example of this. What is the optimal timing and deployment of solutions across a water network to provide the maximum leakage reduction within the financial constraints?
- Achieving a 50% reduction by 2050 is a significant challenge for the sector. Most companies are making significant investment in the widescale deployment of sensor technology in the expectation that this will reduce the time taken to find leaks. In combination with a range of other initiatives such as smart metering, pressure management schemes, mains renewal and satellite imaging companies are trusting that they are doing enough to hit and sustain these challenging targets.
- In our experience however, the benefits from such initiatives are simply aggregated, and in many instances, duplicated. This gives a false sense of security and an over inflated view on what leakage reduction will be delivered. The benefit of being able to run multiple scenarios enables different combinations of innovation and existing methods to be applied to the problem, seeking out not only the optimal available blend of solutions, but highlighting where there is further capacity to apply additional innovation.
- These principles are embedded in our Leakage Intelligent Decision Support (LIDS) tool, currently deployed with Severn Trent Water and in the early stages of implementation with Northumbrian Water, see attached Case Study. However, through the Adaptive Planning Process and the accompanying bulk and automated scenario analysis, the principles apply to any business objective where the current approach, methodology or technology is insufficient to deliver the target performance in the longer term.
- We feel this is a significant benefit available from a truly adaptive planning capability which is worth highlighting within the framework.



In Summary

As specialists in the development of software solutions which support **Adaptive Systems Planning** through the provision of rapid and bulk **Scenario Analysis**, BMA welcome the shift towards the use of Adaptive Planning, Adaptive Pathways and Common Reference Scenarios as a means of navigating the increasing uncertainty associated with long term planning processes within the utilities sector.

General advances in technology and planning/optimisation solutions, mean tools are now available (and already deployed in the Water Sector) which enable such an approach, providing:

- long-term optimisation and investment sequencing;
- no- and low-regrets investments proposals;
- long-term customer bill evaluation, ensuring fairness across generations;
- automated bulk scenario management with rapid solve times;
- detailed uncertainty and sensitivity analyses, enabling the stress testing and assurance of chosen pathways and associated triggers; and
- asset system optimisation, ensuring the best possible asset composition and configuration over time, exploiting system headroom, exposing constraints and significantly reducing the risk of stranded assets.

To help realise and exploit the benefits associated with this new approach, BMA are pleased to have the opportunity to provide feedback which we trust is of value to Ofwat and the ongoing PR24 consultation process.

We are happy to share further detail in our thinking or indeed demonstrate how our solutions are enabling clients to establish Adaptive Systems Planning capabilities within their organisations.