

Delivering on the commitments of the leakage route map

Leakage Conference – Nov 2024

Glen Mountfort & Joe Sanders

Decision Making – what do we actually mean?

“Decisions are choices made under conditions of uncertainty, complexity and constraint. Decisions are the primary means of allocating and reallocating the organisation’s finite resources consistent with its value framework to achieve its strategic objectives. Investment decision-making comprises the policy, principles and criteria, decision-support techniques, information and processes to address risks or opportunities. The development of alternatives and the selection of priority solutions across the full life cycle to deliver value to stakeholders.”

Institute of Asset Management (An Anatomy of Asset Management), July 2024

2 Decision-making and analysis

Box 2.A: Decision-making and analysis – key points

Decision-makers rely on various forms of analysis to inform their decisions.

Understanding the rationale for a decision enables the identification and appraisal of options. We can determine whether our desired outcome has been achieved by monitoring the impact of a decision and, if necessary, take further action as appropriate.

A variety of analytical approaches are used to build the evidence base that supports the decision-maker throughout the process. Different analysis may be used at different stages.

In order to ensure that the responsibilities required to deliver analysis that is fit-for-purpose, we identify a framework with 3 important roles: the commissioner of analysis, the analyst and the analytical assurer. Departments and agencies will wish to tailor these roles to meet their local business needs. Each has a role in ensuring the analysis is fit-for-purpose.

Some decisions are more important than others and the underlying analysis will require greater scrutiny. Departments and agencies may determine that a piece of analysis is business critical; in this situation, the governance arrangements and the seniority of the 3 responsibilities outlined in this framework – particular that of the analytical assurer – should be appropriate for the level of risk.

Analysis projects follow a similar life-cycle to that of other projects. Understanding the requirements enables planning and execution of the analysis. The analysis provides results that can be delivered and interpreted against the original requirements. In doing so, the requirements may evolve and further iterations of analysis may be commissioned.

Analysis should be fit-for-purpose. This is to say that there is sufficient confidence that the right analysis has been performed and appropriate analytical quality assurance activities have been conducted.

Even with the knowledge that the right analysis has been performed and appropriate analytical quality assurance activities have been completed, one artefact of analysis remains: the inherent uncertainty of the outcome of the decision. Uncertainty analysis helps to quantify and communicate the results of the analysis.

The analysis should be communicated to the commissioner with appropriate reference to the analytical quality assurance and statements of the residual uncertainty.

The Aqua Book, HM Treasury, 2015

Current legislation, regulatory guidance & best practice

- Water resources planning guideline states “From 2025/26 leakage in your baseline should remain static from the start of your plan to the end of the planning period.”
- Environmental Improvement Plan – 20% reduction in leakage from 19/20 by 31st March 2027 and 30% from the same baseline by 31st March 2032.
- Supplementary government guidance (WRPG) – specifically around leakage but notably the line in relation to SELL is of significance.
- UKWIR (2016) WRMP 2019 methods – decision making process guidance “Demand management and leakage reduction options can be entered with fixed profiles that reduce the demand that is modelled in the system simulation approaches, or that reduce the supply demand deficit in the aggregated approaches. It is also critical to understand and document whether there are any links or dependencies between options, or whether any are mutually exclusive. Consideration of these will need to be incorporated into the decision-making models.

If nothing else, we can likely agree that:

- 1. Government and regulatory guidelines are very high-level**
- 2. There has been a shift away from some key basic principles (economics) with some very stretching long-term targets, and a considerable uncertainty over the evidence basis for the precise EIP targets**
- 3. Best practice around decision making states an important point about dependencies, but there is little practical guidance on how to do that, particularly with respect to leakage and the complex inter-relationships each option has, and rarely with just one single way of managing leakage being deployed in any given area.**

9.3.1 Your planned level of leakage

In your final plan forecast you should consider current government policy and assess all options to reduce leakage further, alongside other feasible options. You should consider the value that your customers place on reducing leakage and the benefits this will bring to your customers’ willingness to participate in demand management, as well as other benefits to the environment.

Previously, companies have used the sustainable economic level of leakage method to determine levels of leakage. However, this is no longer acceptable for use in WRMPs and you should consider instead government’s, regulators’ and customers’ views when deciding on your planned level of leakage.

You should explore the use of innovative approaches to achieve leakage reductions in line with leading companies.

When selecting your final plan leakage forecast, you should clearly explain the different activities that contribute to this level, including the costs and volumetric benefits that contribute to the supply-demand balance.

Government and regulators expect you to achieve the leakage reductions in your preferred programme, particularly in the short term. You should consider and manage the uncertainty around your leakage programme and the implications for security of supply if your planned level is not met.

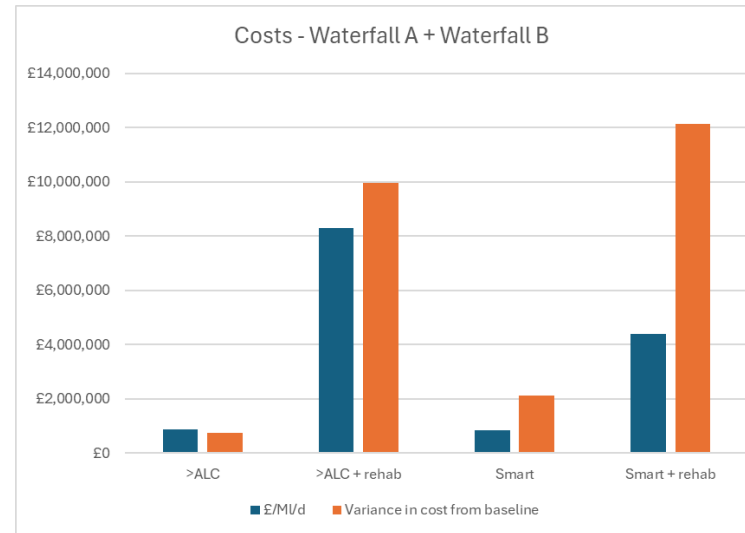
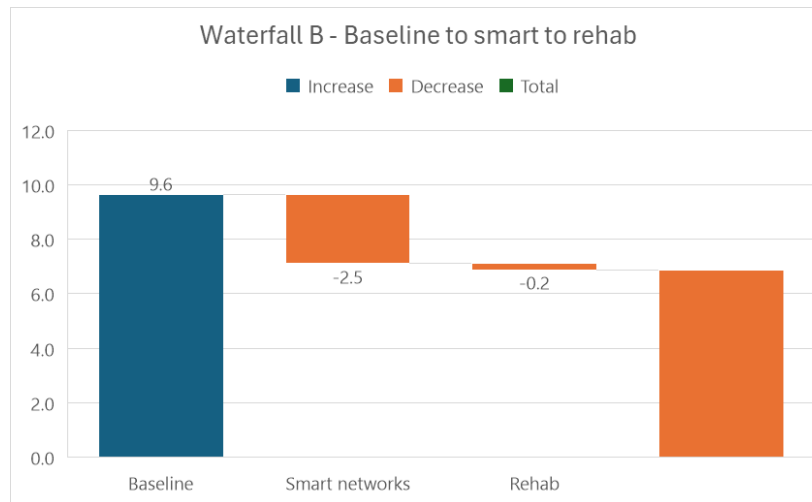
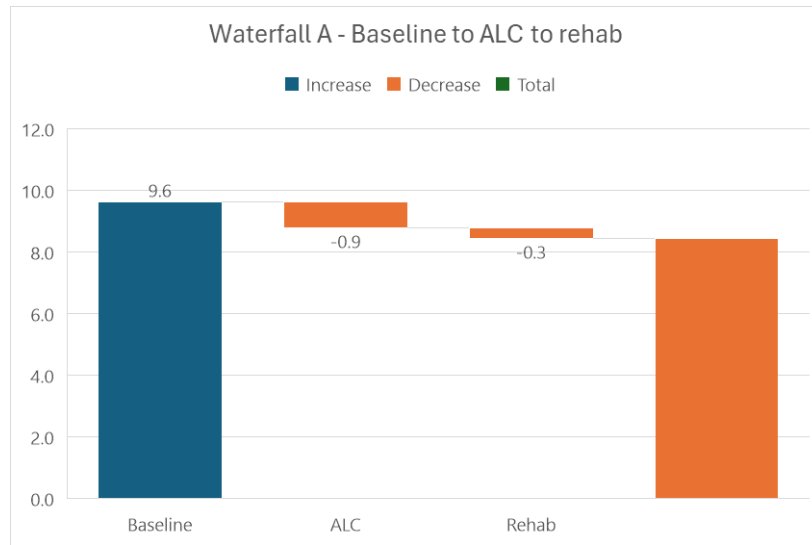
Regulators will expect you to deliver the leakage commitments set out in your WRMP. Any changes to your final plan WRMP leakage programme may be considered as a material change in circumstance and you may be directed to re-consult on your plan. You should therefore, set out ambitious, but realistic plans for leakage within your WRMP. Unrealistic ambitions may cause confusion with your customers and you may be required to make a public statement if you fail to achieve your planned leakage.

You should (as a minimum), plan to meet Water UK’s commitment, on behalf of the industry, to reduce leakage by 50% by 2050 (from actual 2017 levels). In addition you should plan to meet any leakage targets set out in Ofwat’s price review methodology or by government. You may wish to consider setting more challenging targets for reducing leakage than these, if you can demonstrate you have support from your customers.

What are some of the problems, limitations, challenges and risks?

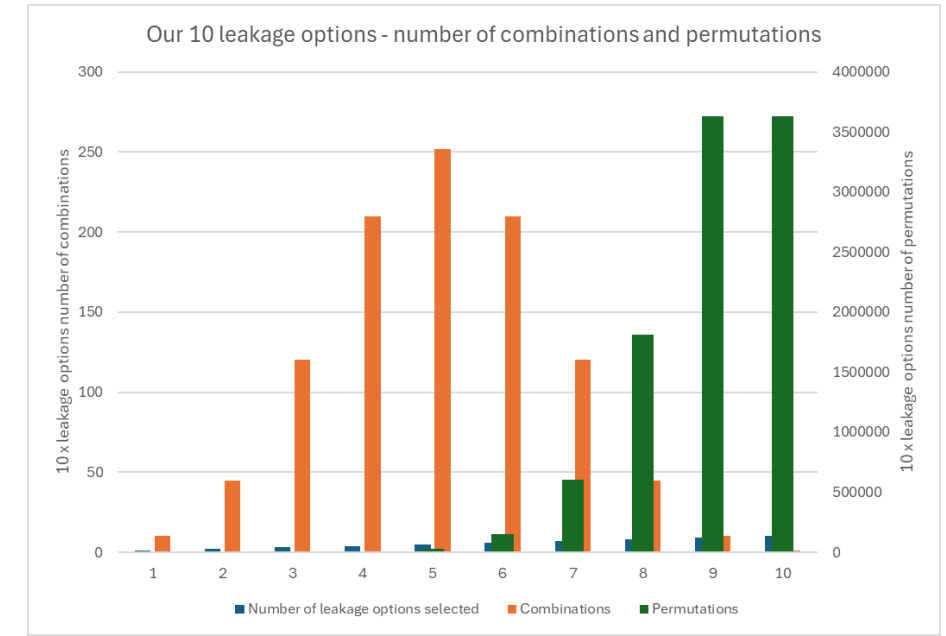
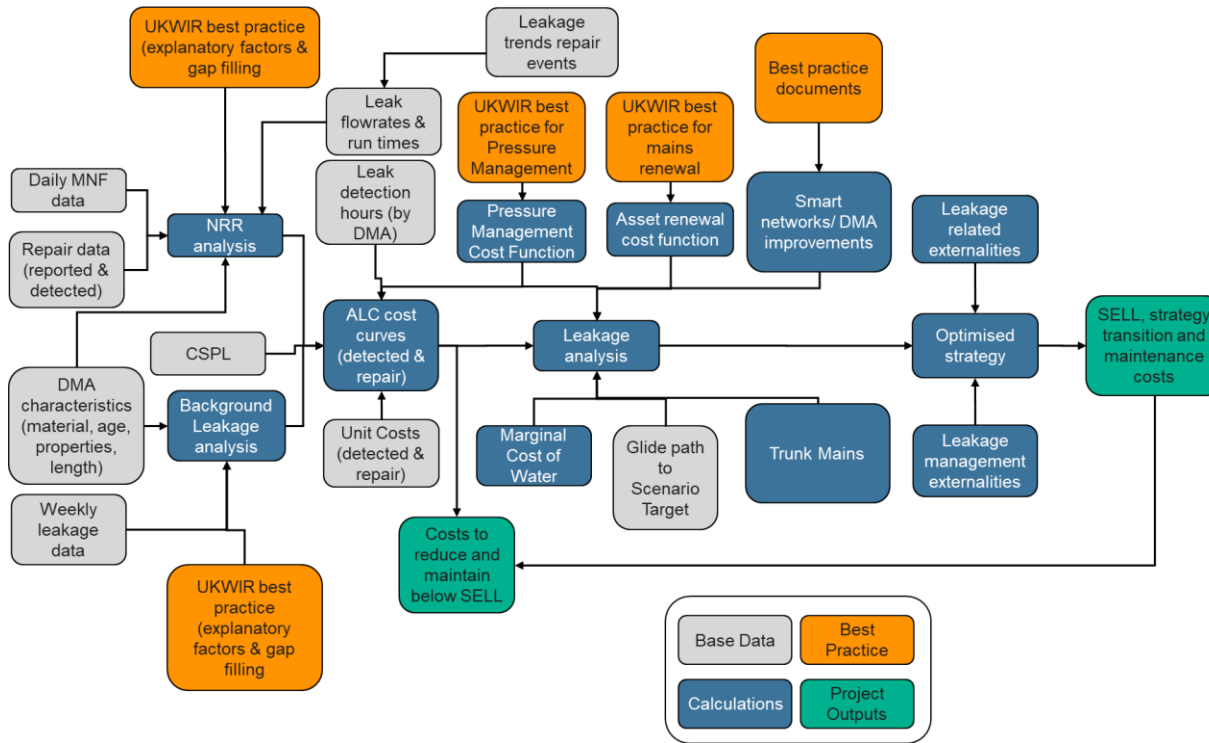
Risk	Areas to consider
Is the EIP target truly delivering best-value for society, customers, environment?	The need to articulate the true cost of the 50% reduction in leakage by 2050, and the optimal mix across PALM, taking a holistic and balanced approach to setting out leakage strategies where the future differences are fully considered (both risks and opportunities) along with a realistic view on the likely costs.
Setting the baseline – is the future different?	There are future risks such as network deterioration, including communication pipes to consider along with supply pipe deterioration with its ownership complexities. Climate change may result in a more susceptible network to failure during weather extremes. On the positive, metering and technology improvements.
Leakage options are rarely discrete –potential for optimism bias	Discrete leakage options (ALC, pressure management, calm networks, smart networks etc.) all inter-relate and overlap leading to potential optimism bias. Modelling a small number of leakage scenarios can reduce this risk and provide a more robust, high quality set of leakage profiles into the WRMP.
WRMP and business plan drivers are not the same	A more integrated approach with mains rehabilitation policy and strategy and supply pipe policy being modelled as an integrated leakage strategy rather than separately.
Supply pipe leakage and ownership	Modelling/quantification of this risk – gathering data, improving understanding. Regulators/gov - ownership
When might innovation help?	Adaptive pathways should be used with appropriate decision points that have been determined through sensitivity analysis. e.g. if there was a reduction of 50% of the cost of repairs or sensors due to innovation, deployment could increase for the same cost and reduce leakage further.
Inconsistent leakage strategies across the industry	The government and regulatory guidelines and guidance is very high-level, and UKWIR best practice for the WRMP is not specific to some of the challenges around leakage management. There is a gap to fill.

The challenge of leakage management options



- Two short pathways going from baseline and two leakage interventions
- Waterfall A – ALC and then rehab provides a 1.2 ML/d reduction
- Waterfall B – smart networks then rehab provides a 2.7 ML/d reduction
- £/MI/d as a quick comparison varies hugely when looking at the problem in a holistic sense rather than the individual options
- The preceding option(s) impacts on the benefits that can be realised
- Ultimately we only have a finite amount of leakage to go after.
- Hypothetically we could reduce leakage to policy min using ALC or smart networks but we cannot sum that benefit in modelling
- Each intervention changes the available leakage for the next option
- With 3.5 million permutations – needs to be carefully considered in modelling and optimisation
- Note how the Waterfall B option is slightly more expensive but vastly different in terms of £/MI/d
- Consider in a WRMP where £/MI and AIC/AISCs are presented and compared –how this might skew any modelling and optimisation?

The scale of the problem - modelling overlapping benefits



Audience participation –

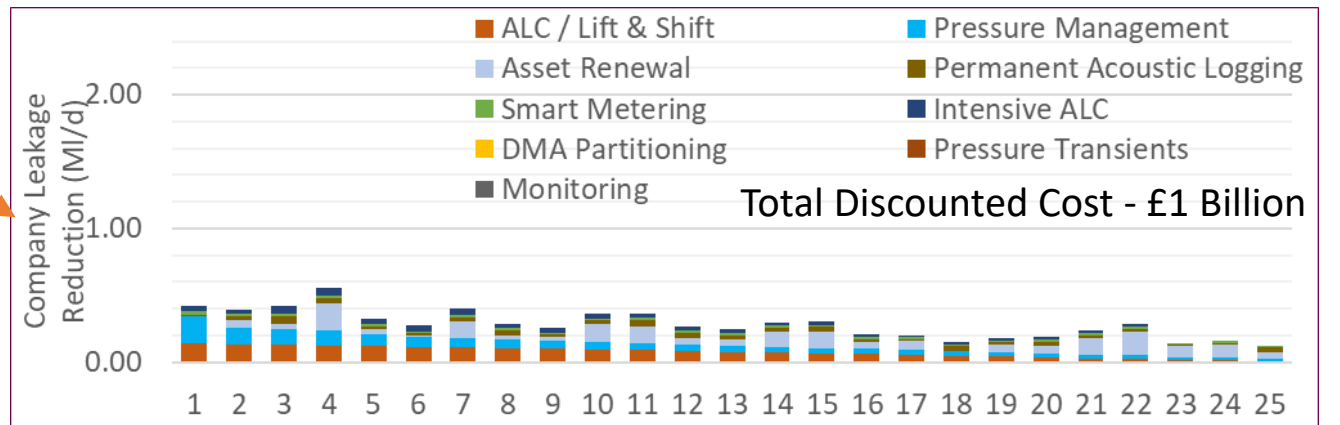
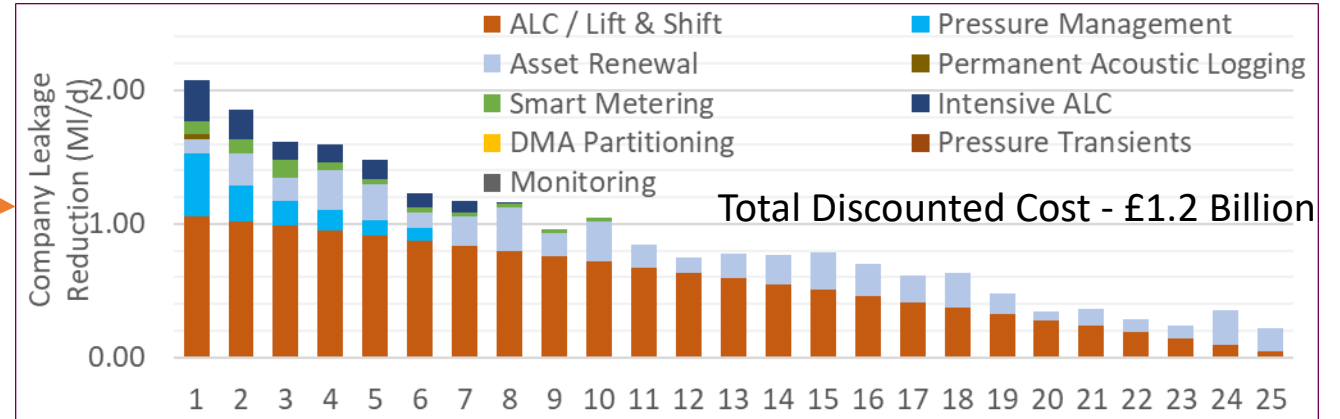
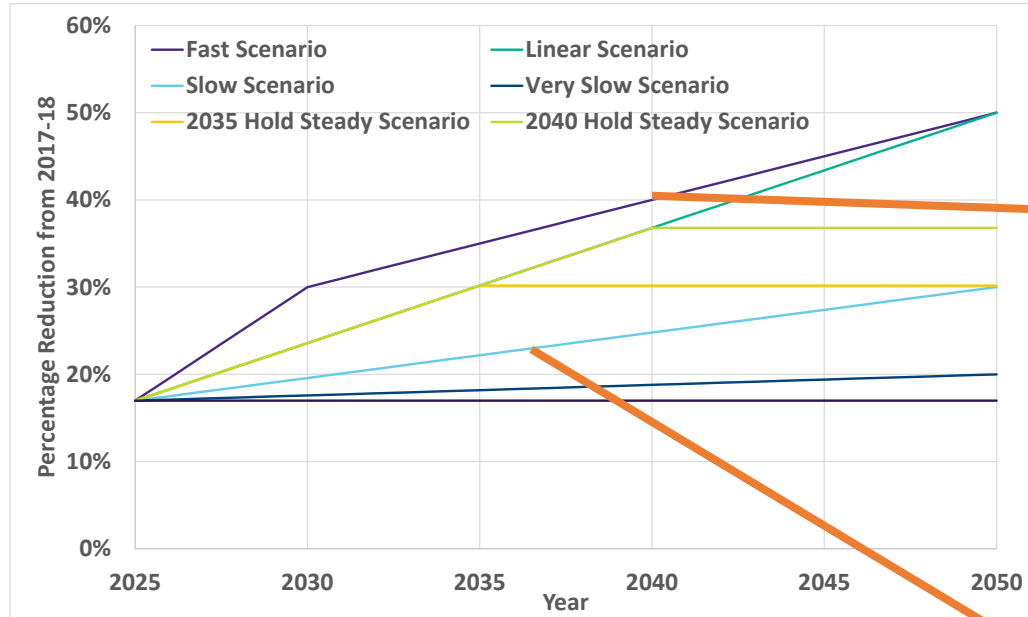
How many DMAs or zones are you only doing one leakage management option?

How do you account for this is the analysis along with the linkages between the overlapping options?

Our 10 options here for illustrative purposes – result in 3.5m permutations (where the order matters)

Scenarios

The problem has changed, no longer the economical level of leakage, we need to solve the economical way to achieve a level of leakage.

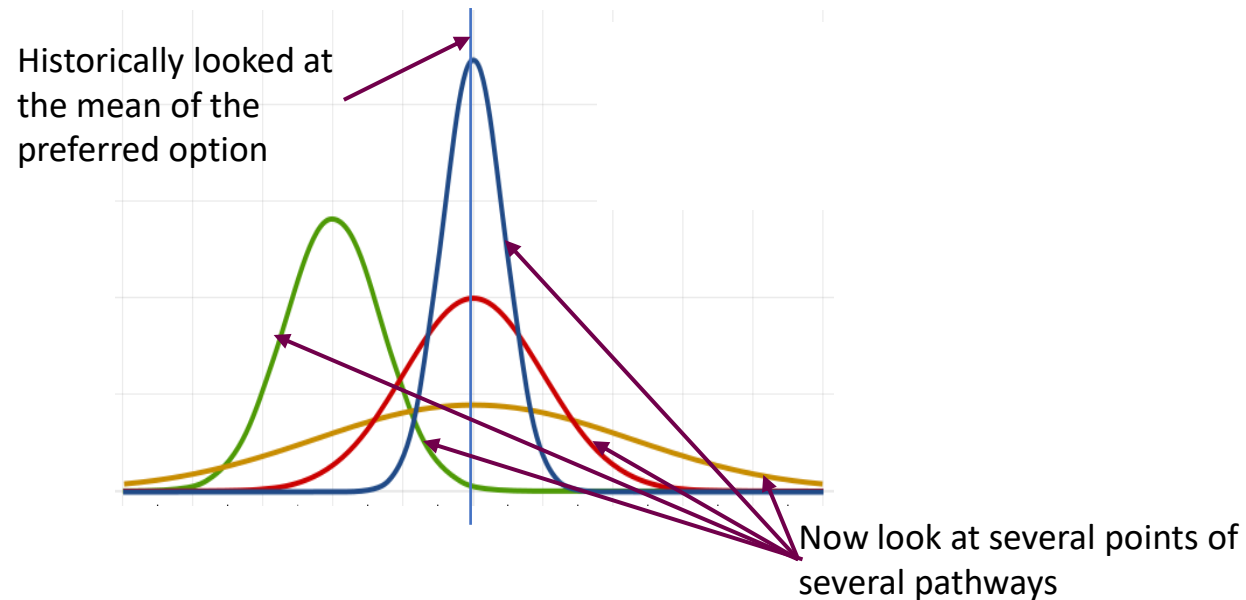


Adaptive pathways

When do we know when the strategy isn't working and what do we do next

“Adaptive plans provide visibility and accountability around how companies' long-term strategies will change in the future.”

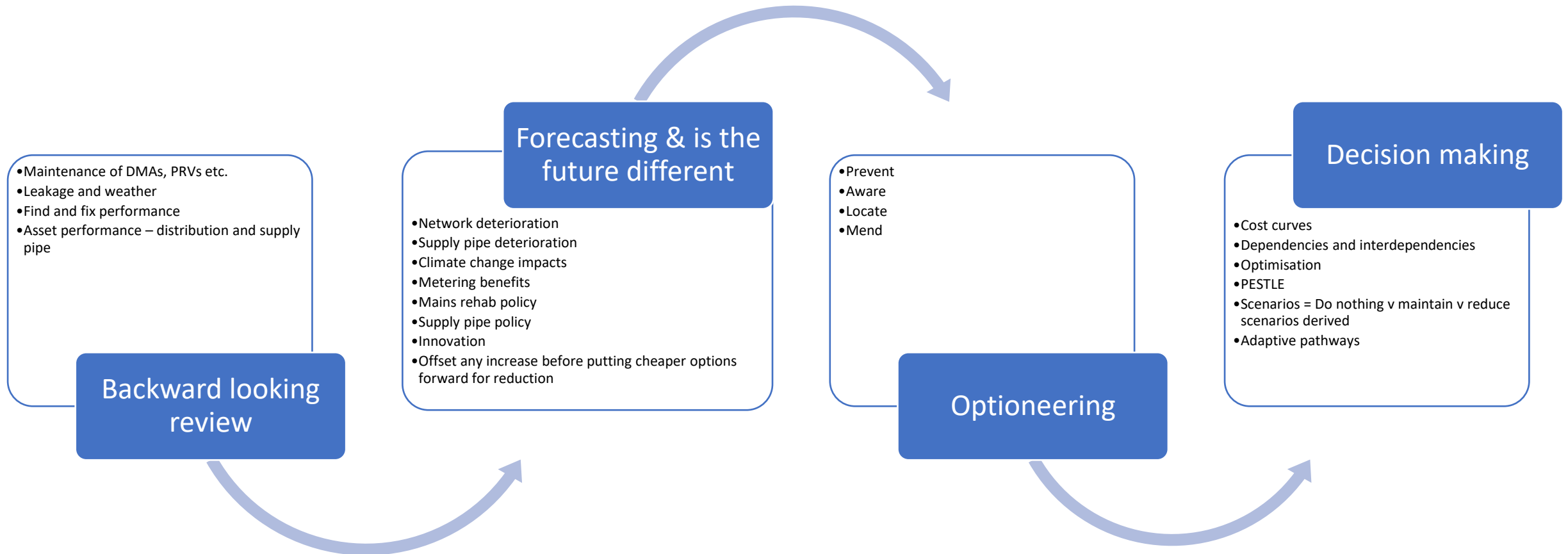
Aileen Armstrong, Senior Director Ofwat 17 November 2021



Adaptive pathways – Kingsbrough et al. Framework



What a robust strategy needs to include?



Workshop

There is a need for either of both of the following:

1. Water companies to recognise there is a benefit to all following a high-level framework (agnostic to any particular modelling approaches) that ensures all companies present a robust leakage strategy to regulators at PR29 and beyond. Decision making is a key element to this but also providing a sound evidence base.
2. Regulators to consider the benefit of companies providing a leakage strategy in the PR29 plans, in a more consistent way that encompasses leakage scenarios in decision making. This could be supported through planning guidelines.

It is our intention to publish a paper/article to set out further detail than we've shared today, and it is important to consider a wide pool of stakeholders. We therefore would like people to express interest in attending an online workshop in early 2025.

The workshop will be to cover:

1. What the framework should or shouldn't include
2. How to communicate best the need for the decision-making framework?
3. Identify any further work/influencing that might be needed (UKWIR project, similar?)