Valuing the invaluable – a framework for valuing the economic, social and environmental benefits of water conservation

Alexus van der Weyden – Director, Frontier Economics

Presentation to SIWW: *Session 1.4: Developing a Business Case for Water Loss Reduction*

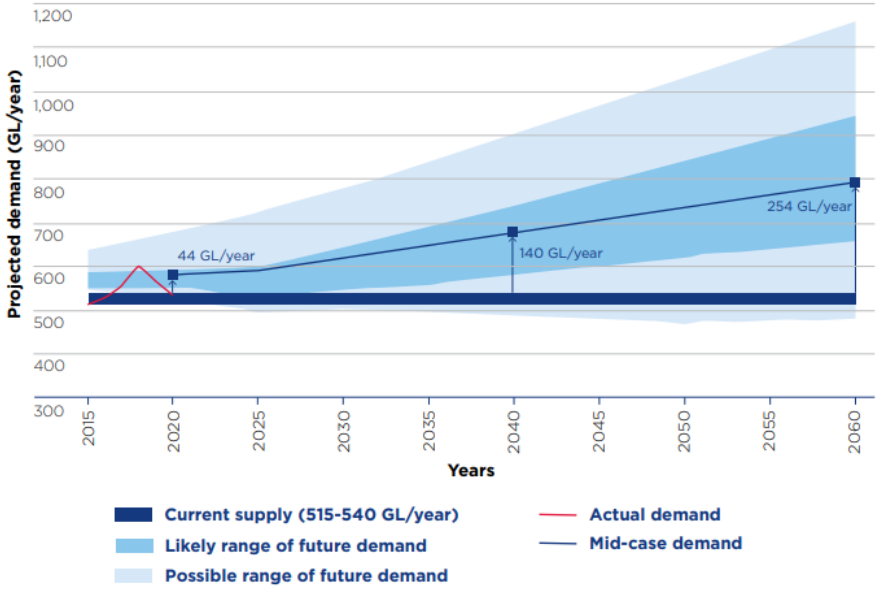
Focus

- The context
- The role of water conservation
- The barriers to investment in water conservation, and the consequences
- The role of economic frameworks in supporting holistic, evidence-based and adaptive decision-making
- Applying economic frameworks in practice: Insights from Australia
- Remaining barriers to be addressed

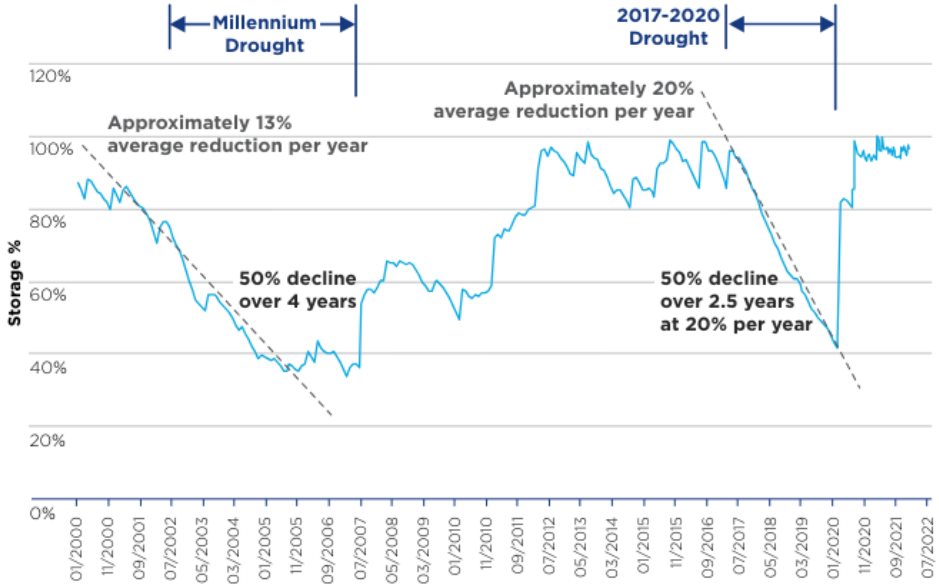
The context: Significant investment in water supply…

…to manage urban growth…

Greater Sydney: Projected water demand to 2060*



…& to manage climate variability

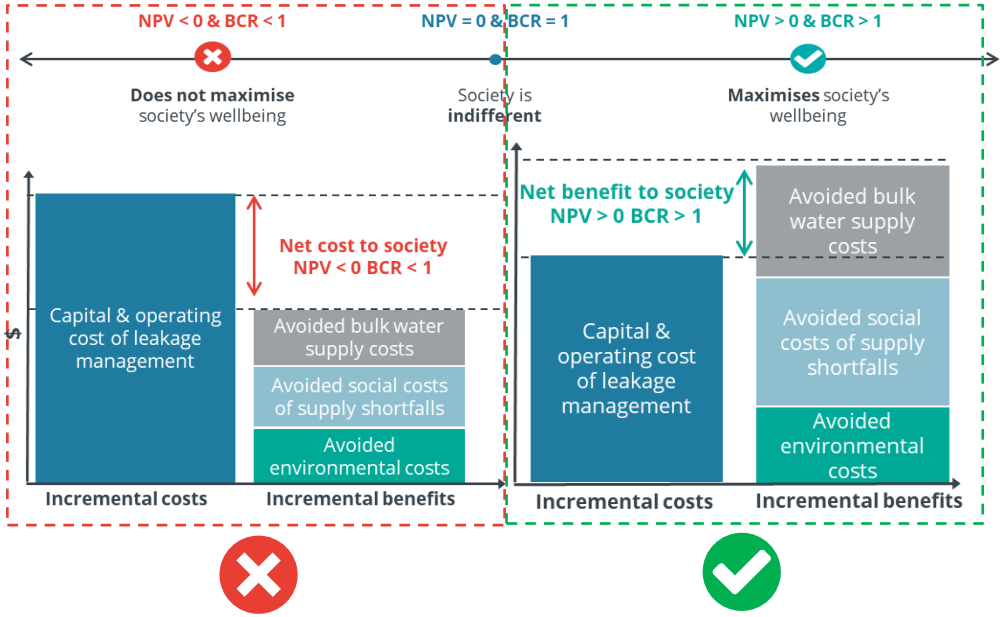


Greater Sydney: Declining dam levels during recent droughts*

*NSW Government, *Greater Sydney Water Strategy*, 2022

Why water conservation & what is its role?

Managing the water cycle in an economically efficient way



Supporting community expectations for sustainability

* Hunter Water, Community Plan, 16 March 2024: Graphic recording Jessamy Gee @ THINK.IN.COLOUR

What does water conservation look like?

There are a range of conservation measures with different costs & benefits

Focus of session

Demand management & water efficiency

Reducing consumption through use of ***grey*** (efficient appliances) & ***green infrastructure*** (irrigation and vegetation in open space), pricing (inside & outside of drought), water restrictions, and ***behavioural change*** incl. education programs through to mandatory enforceable rules

Leakage management

Reducing water sourced by utilities and/or billed through managing leaks in water supply on utility & customer side of the meter

Small scale supply & reuse

Reducing water supplied by utilities through use of on-site supply solutions including rainwater tanks and 'on-lot' recycling (incl. greywater)

Larger scale reuse

Reducing water supplied by utilities from climate dependent potable water system including larger scale stormwater and wastewater recycling

Potential spectrum of water conservation

Inability to robustly measure the economic, social and environmental value of the programs is a key barrier

This results in the following behaviours and outcomes:

Institutional governance

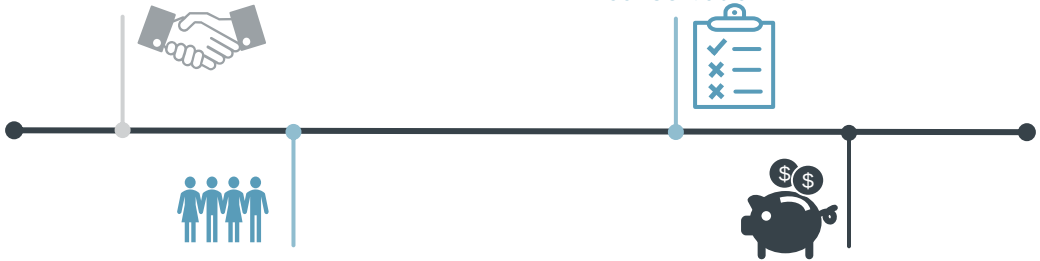
Institutional attitudes and capacity

Economic regulation

Funding and delivery

Lack of **clear expectations & oversight** from Government and shareholder with respect to water conservation outcomes

Regulatory framework does not provide consistent guidance on valuing costs and benefits of water conservation or provide consistent incentives for investment in water conservation



Water utilities do not prioritise investment in capacity to identify, evaluate and adapt potential programs over time. Potential to favour 'build solutions'.

Water utilities do not fully pursue, or cannot justify investment in water conservation to internal decision-makers to fund programs

Water utilities do not respond to financial & reputational incentives in economic regulatory framework, potentially leading to **under-investment** in water conservation, at a cost to customers and society

How do we start to address these barriers?

We need to value water, and the community value from conserving its use...

Holistically, by account for the broad set of economic, social and environmental value it can deliver. It is more than just reducing financial losses.

Methodologically, by adopting sound and consistent valuation methodologies that link the investment to the community outcomes – expressed in economic ($) terms.

Dynamically & data driven, by investing in processes and systems to collect information that can be used regularly to update estimates of value as conditions change.

Our (small) role…

Developing an economic valuation framework for water conservation (for use by governments, regulators and utilities)

Economic evaluation ('how to') guidelines tailored to water conservation

+

'Catalogue' of values covering economic, social and environmental outcomes

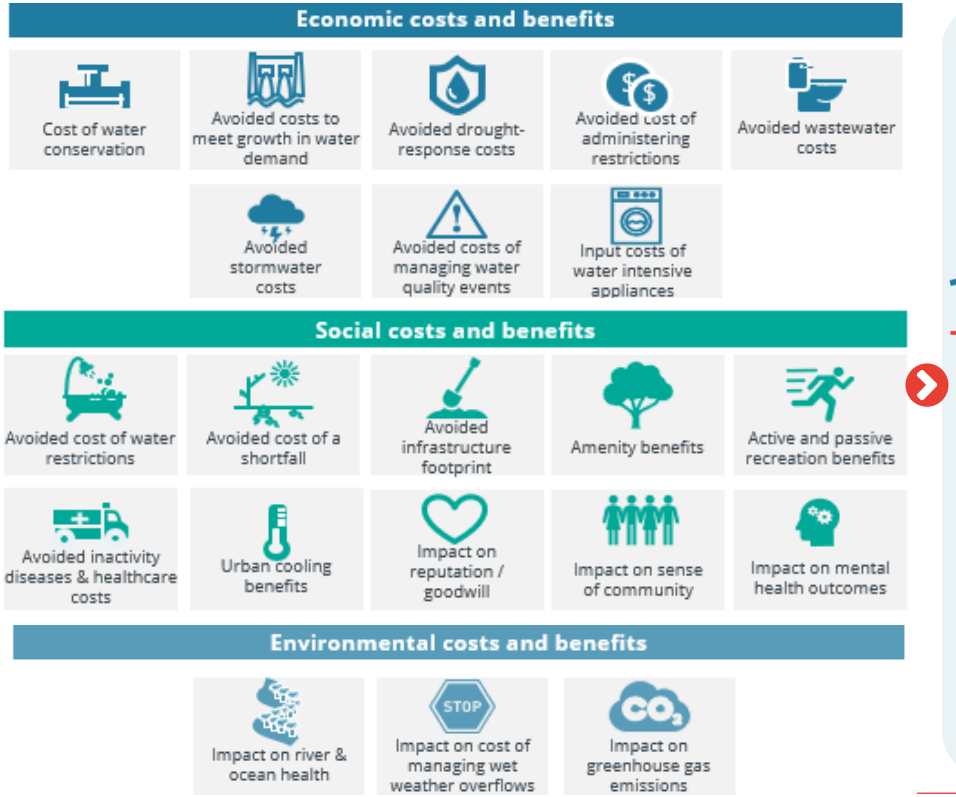
+

Template cost-benefit analysis (CBA) model, with in-built functionality

=

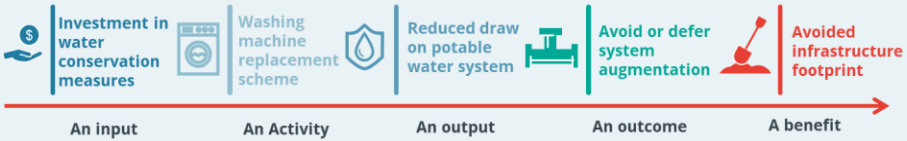
Better business cases?

Our (small) role (continued)…



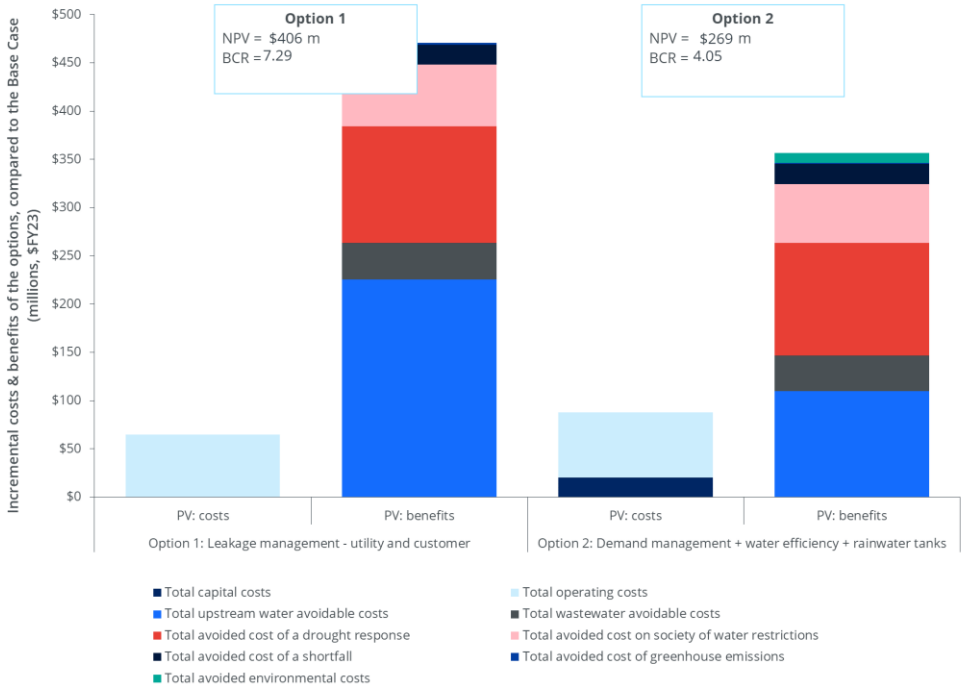
For each impact we developed:

1. ‘Logic map’ linking water conservation and avoided infrastructure footprint



2. Valuation methodology linking water conservation and avoided infrastructure footprint

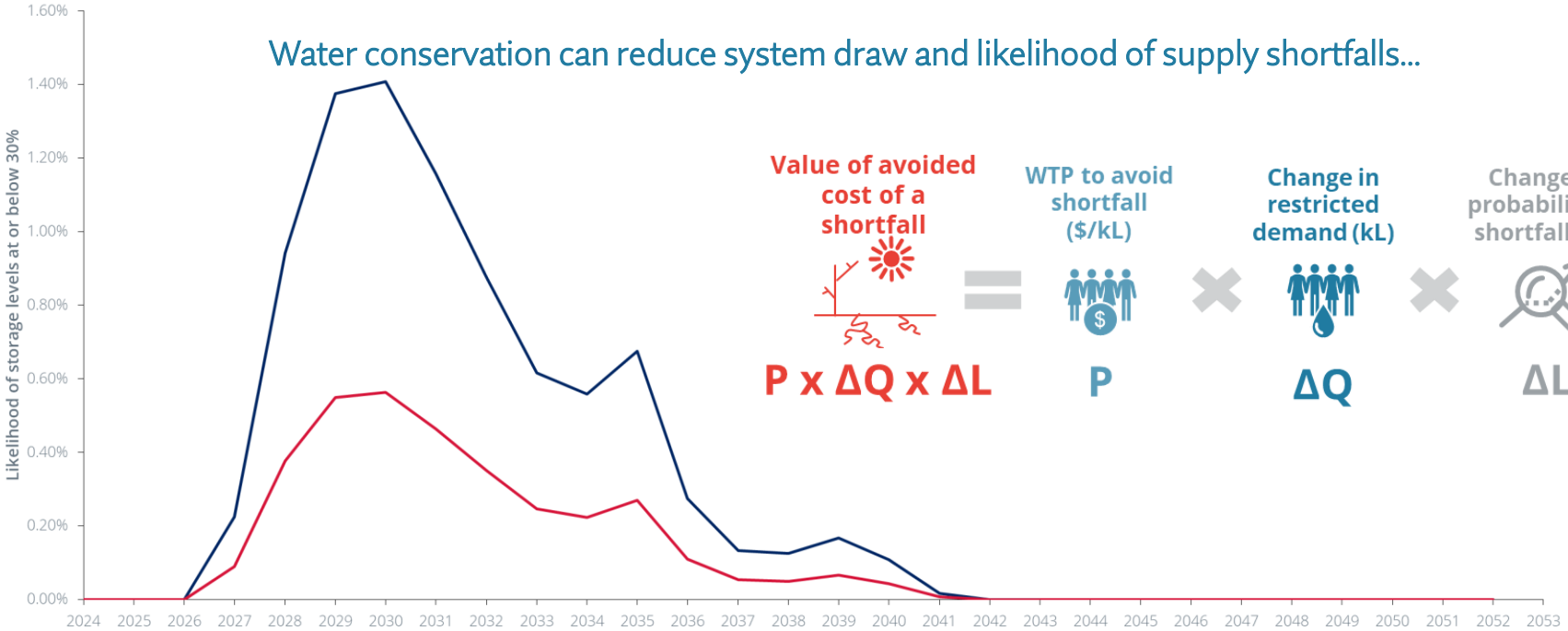
Illustrative case study: Metropolitan coastal utility – CBA results ($NPV, 30 years):



The analysis found moderate investment ($4-6m/pa) in leakage management and/or demand management generates large economic, social and environmental benefits...

And the benefits go beyond avoided financial costs savings from deferring investment in new water sources to balance long-term supply & demand...

A key value driver are avoided social costs to community from reduced risk of supply restrictions & shortfalls...



This dynamic value is often understated or excluded from business cases, undermining the value of water conservation

Our insights from urban Australia

Still a strong need to get the basics right, such as identify ting system constraints, and the relationship between demand, supply response and cost of infrastructure across all aspects of water cycle
e.g., estimating LRMC of water and sewage systems, and avoidable costs of supply from conservation

Opportunities to enhance understanding of climate risk (on supply and demand) and system performance - and impact of water conservation
e.g., estimating *change* in likelihood of supply shortfalls to calculate ENPV

Opportunities to strengthen monetary estimates of socio-economic and socio-cultural value from improved supply resilience
e.g., water as input to industrial /business processes, recreation / amenity (incl. urban heat mitigation), water as ecosystem service and cultural attitudes

Harnessing these opportunities will significantly improve the case for water conservation.

This should ultimately improve use of scarce resources, improve resilience & lower costs of managing water cycle (and utility bills).

What is left to do?

1. Address incentives and attitudes that bias focus on supply-side responses (institutional, regulatory etc.)

2. Continue to harness the 'power' of economic valuation techniques (such as CBA) to provide a logical appraisal tool for investment in the water cycle: to support holistic, evidence-based and adaptive decision-making

3. Work collectively to build knowledge and datasets through this multi-disciplinary challenge – engineers, hydrologists, economists, ecologists etc. – to understand important causal relationships across the water cycle

4. Establish frameworks to incorporate other socio-cultural values of water into decision-making

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Brisbane | Melbourne | Singapore | Sydney

Ground Floor, 395 Collins Street
Melbourne VIC 3000 Australia
Tel: +61 3 9620 4488

contact@frontier-economics.com.au
www.frontier-economics.com.au

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