

Embracing Water Value, Circular Economy, and Renewable Energy Synergies: Case Study

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Water is Unique –RPS-

The circular economy of water (CEW) has attracted considerable attention to sustain the water sector

water is a unique element in CE domain as water is

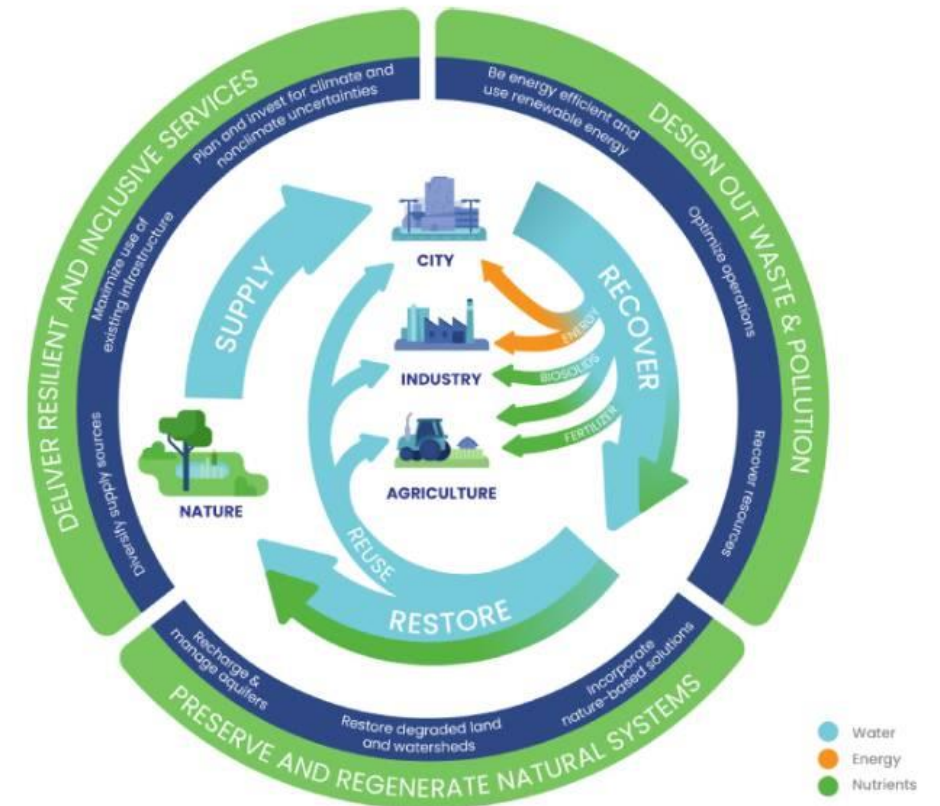
A resource (critical input resource for the world economy)

A product (when it is sold, and when it is virtual))

A service (when it is used to store or produce energy)

Without consistent conceptualization of CEW, decision-makers, scientists and professionals are unable to developing a shared understanding of problems and solutions and exploiting new opportunities

THE WICER FRAMEWORK





CWE: Decreasing, Optimising & Retaining

This transformational change implies thinking in a **systemic way** across multiple levels to favour a more circular utilisation

Decreasing: This category includes three strategies to use less water or no water at all: Avoid, Reduce and Replace

Retaining: refers to strategies that store water and recover water and its embedded resources so that they are retained in the economic system

Optimising: refers to the strategies devised to use water more efficiently or intensively than before. In this case, savings derive from using the same water more than once



Table (1): Participants distribution across the survey

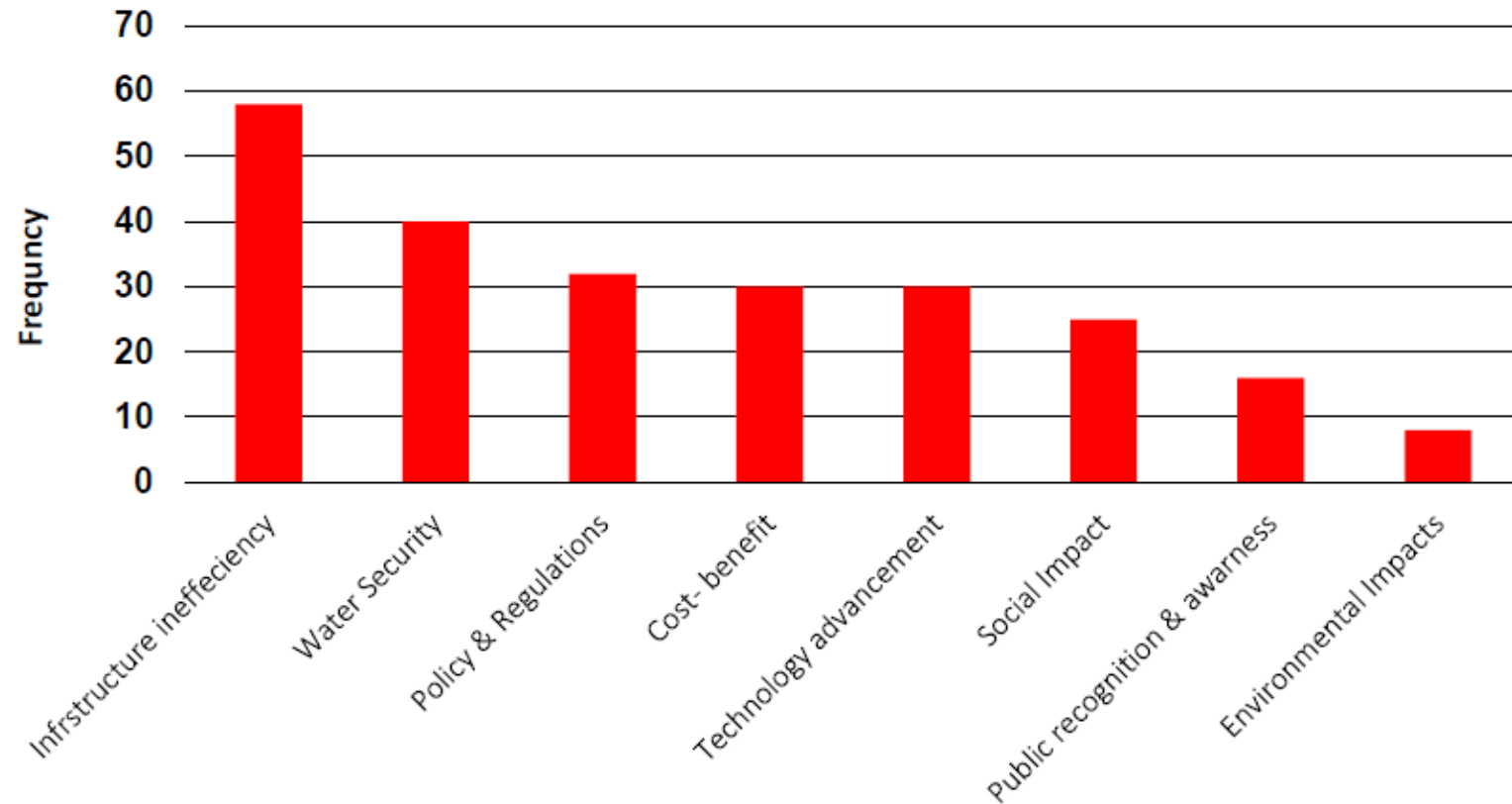
Participants	Frequency
Water Experts	6
Academics	18
Water Utility	16
Queensland Water	18
Water Industry	8
Community	150
Others	12

Participants distribution across the survey

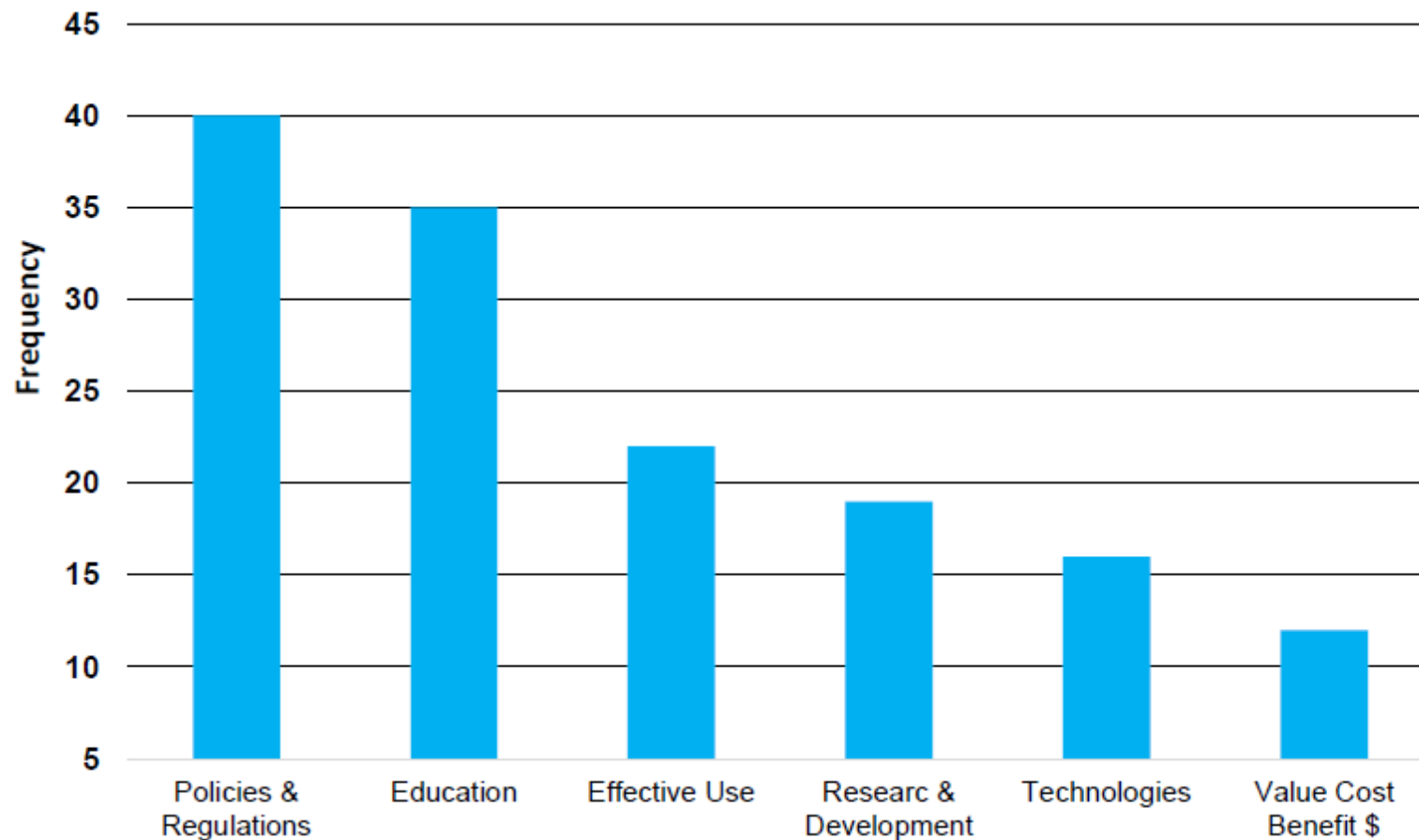
- Around 228 participants from various disciplines representing the whole water industry spectrum (including 48 experts) were selected to take part



The main top challenges towards CE transitions

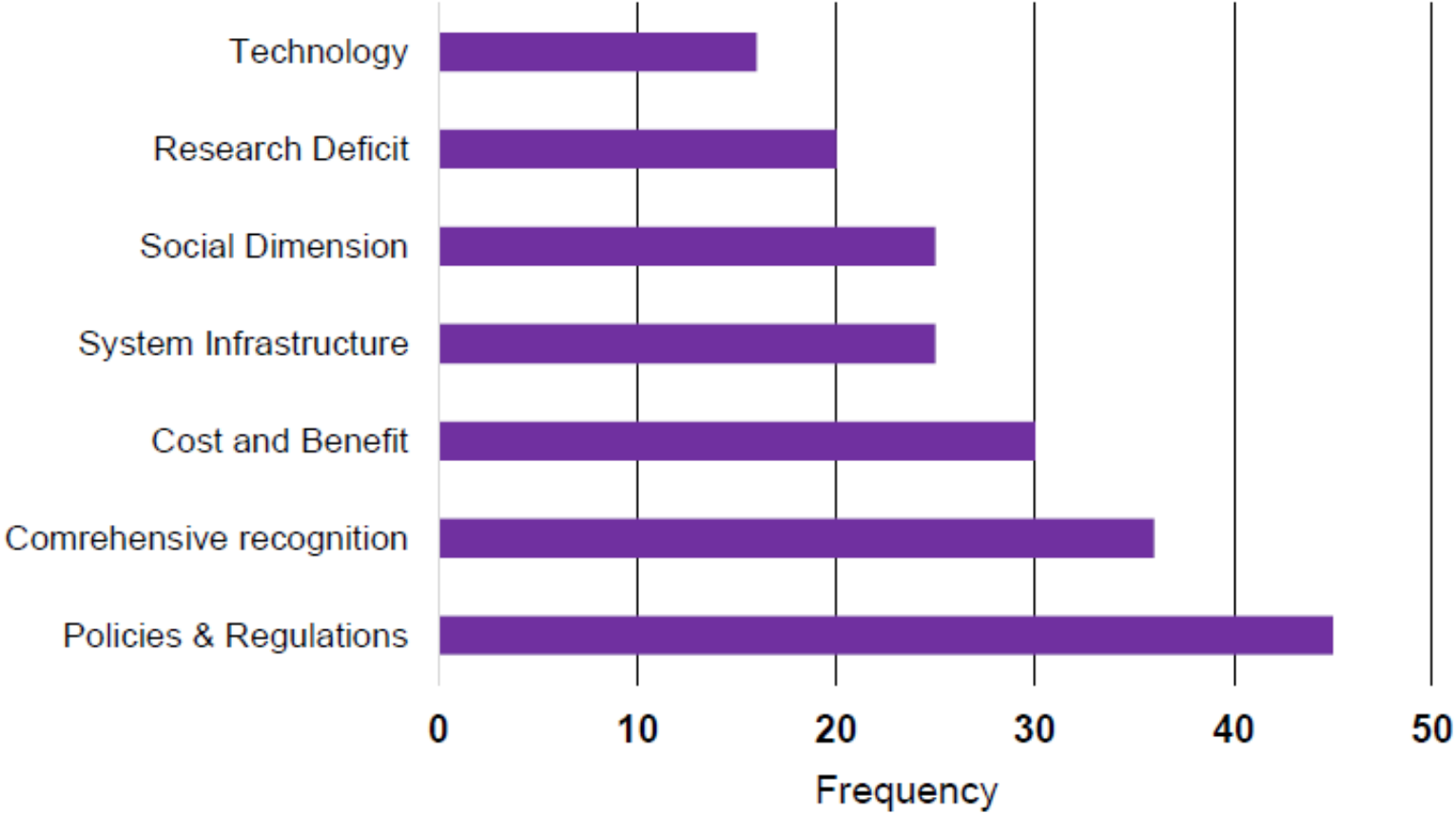


Options for solutions to address CEW transitions





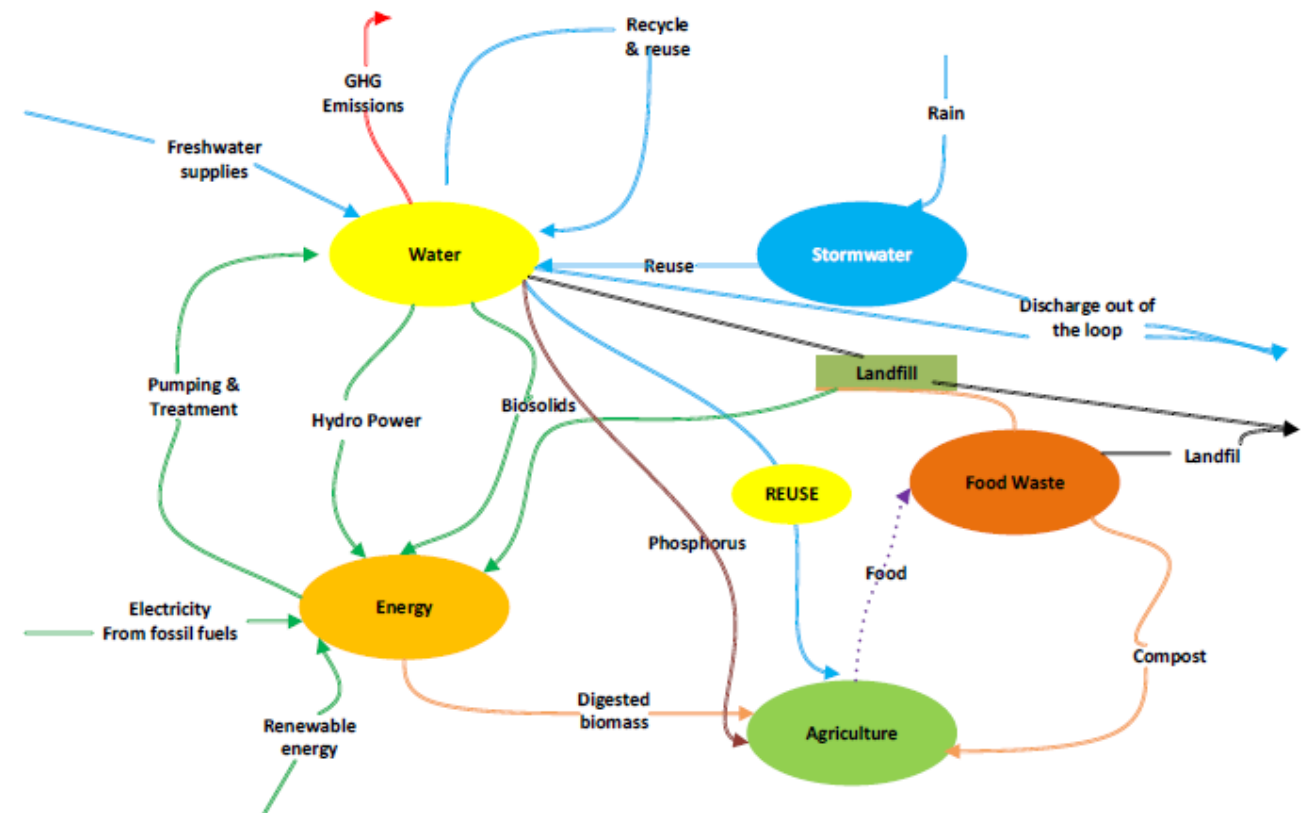
Barriers to implement CEW transition in Queensland





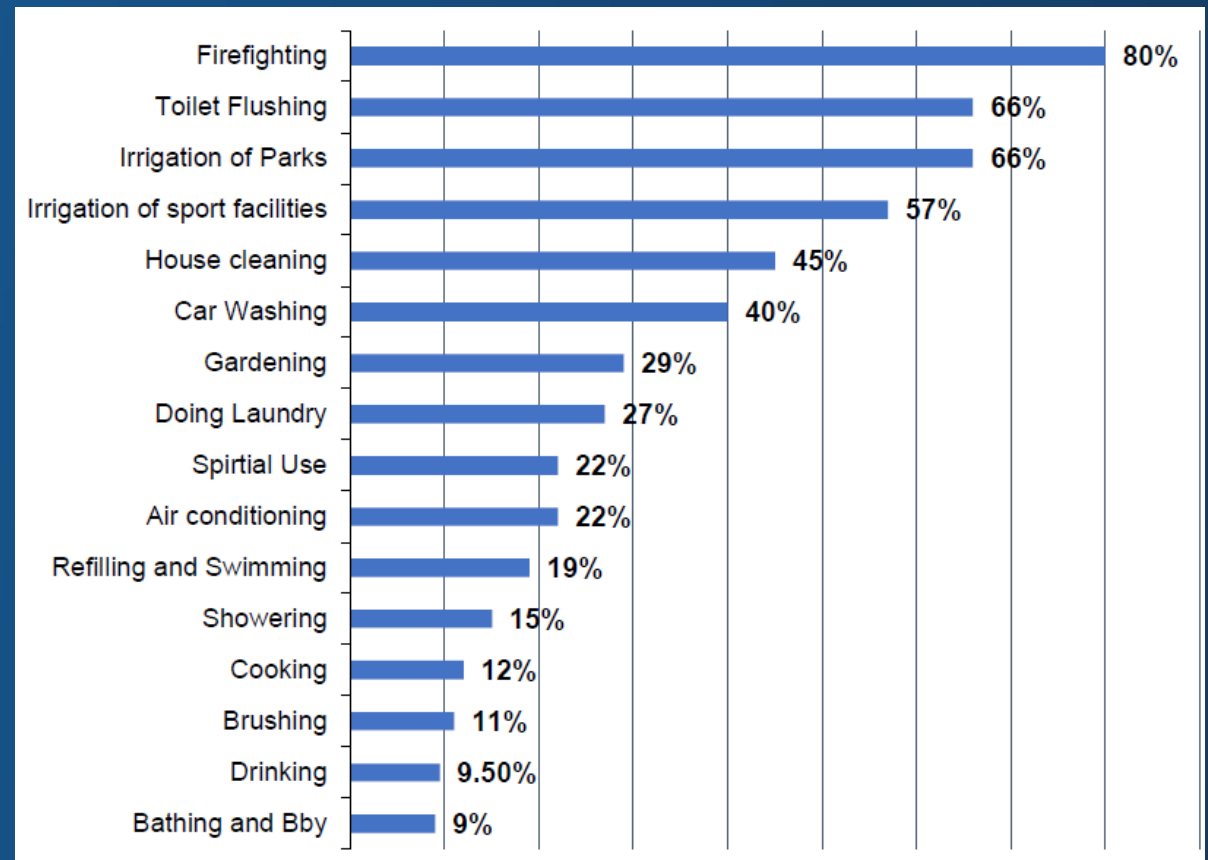
Cognitive presentation of CE nexus cross relations

The lack of comprehensive system thinking was identified as a barrier with some participants perceiving that the short-term focus on profitability was creating a barrier to change. This has identified a need to represent the cycle of the CE where the components can be interlinked in a more visible and direct way



Community perception on water use towards CE transition in Queensland

- Reusing and recycling in Central Queensland have posed a significant challenge to date, due to tremendous public suspicion of recycled water. Results indicated that people have less trust in recycled water with only 9% showed that they may utilise this recycled scheme in bath compared to 80% were willing to use in the case of firefighting



Conclusions

- Water utilities can champion the CEW and chair the resource stewards. Moreover, there is a potential for water utilities to further research, plan and invest in a new circular
- The implementation of CE principles in water sector requires a holistic approach.
- Possible pathways for implementation can be inspired by solutions already developed,
- Cost is a main challenge in CEW transition as it includes (investment costs, operating costs, environmental profits).
- The assessment of the full potential of the existing infrastructure, resulting in huge savings in delayed capital investments. Source Recovery and creation new source is also a cost effective option
- Introducing solutions towards CEW requires education & Community Engagement
- It is also important to determine the risks arising from the quality of the recovered raw material, generation of other waste in the recovery process, and energy balance.
- There is a need to move beyond 'sustaining' to 'restoring' the water as a product and to go further with 'regenerative' actions that will ensure sustainable, affordable, resilience water sector able to adapt.

شكرا لكم!



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