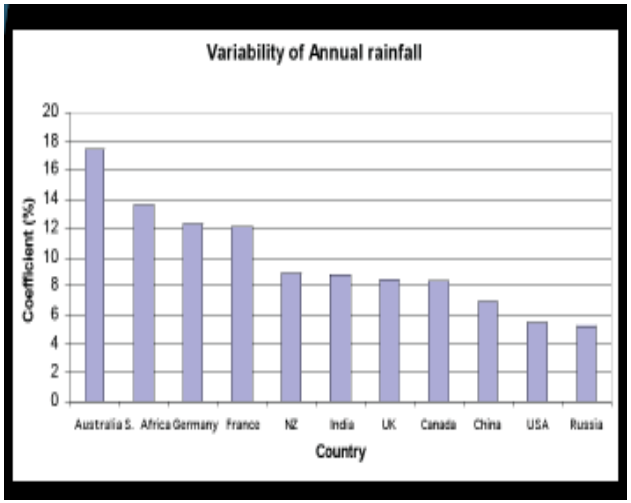
Australian Water Recycling Centre of Excellence

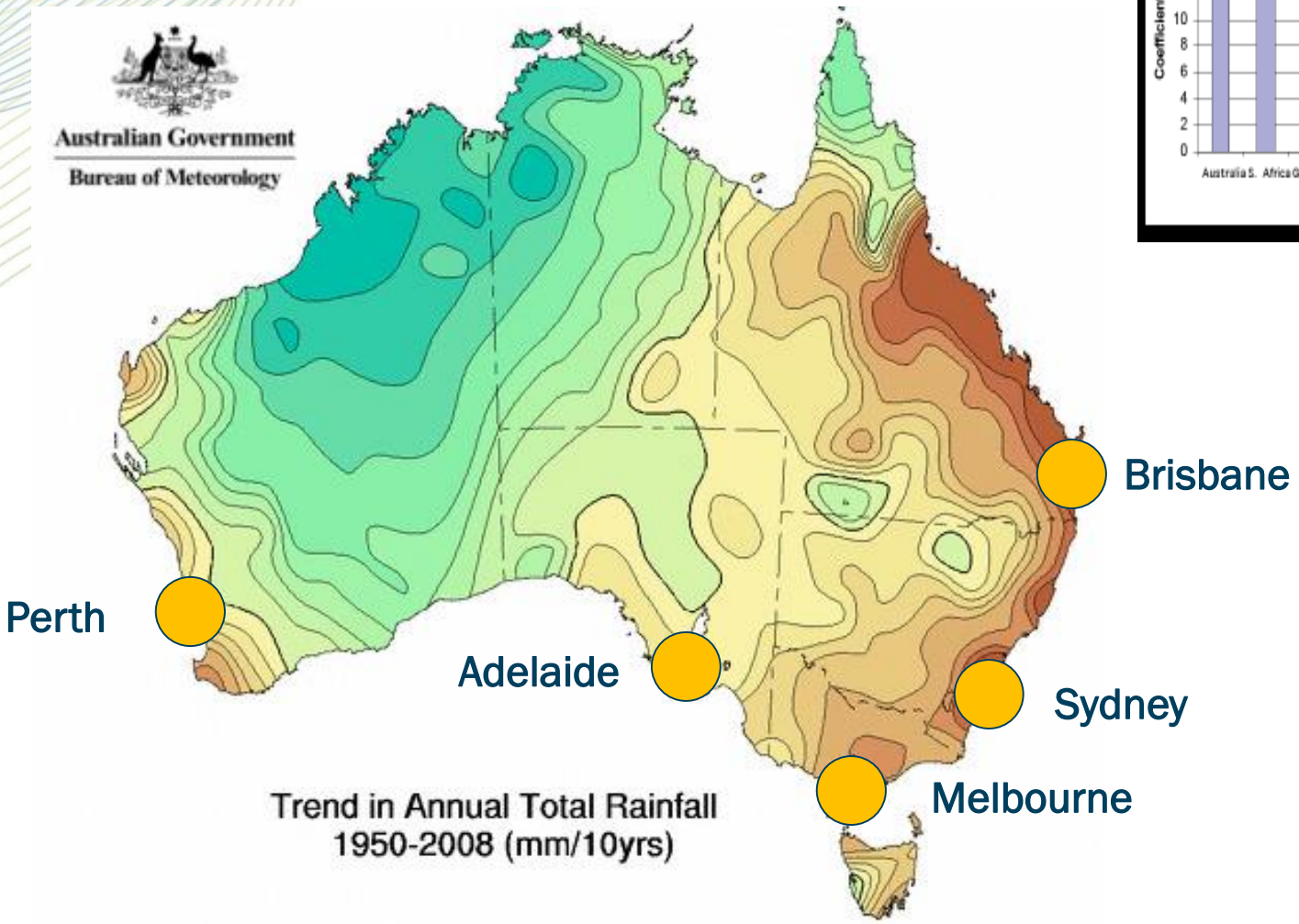
Water Recycling for Drinking

Australian Government

Mark O'Donohue
CEO - Centre of Excellence

Long Term Trend in Rainfall





Water Reuse Schemes

Increasing diversity of applications

Reuse for agriculture, environment, industry and consumption

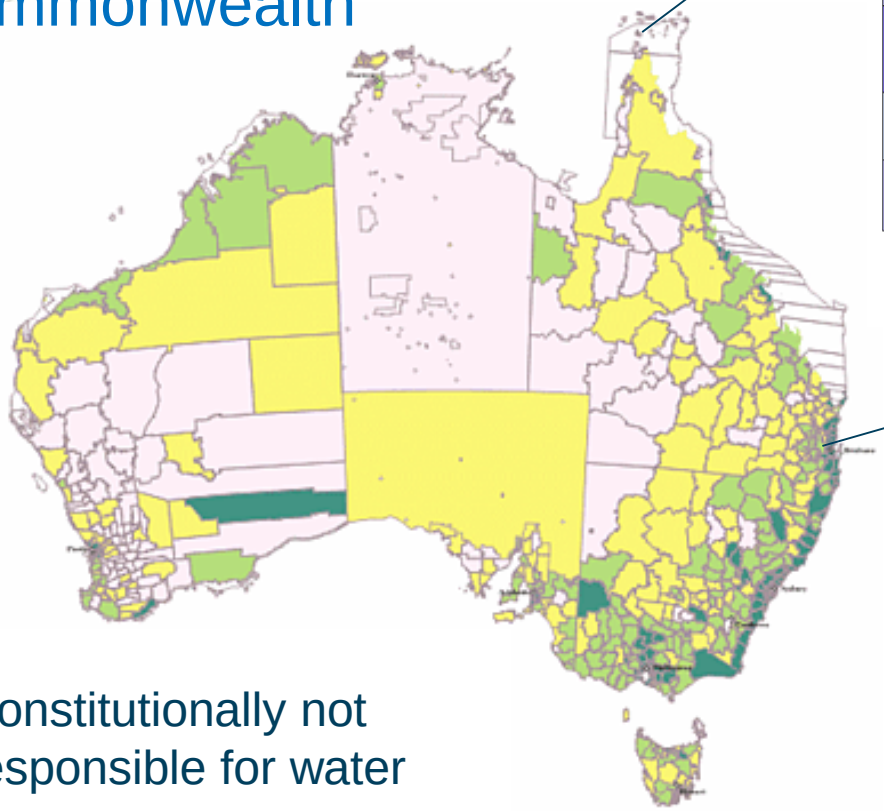
Innovative approaches to large and small scale recycling schemes

Collectively these schemes and initiatives are making a difference

~75% increase in water reuse between 2005 and 2012 (NPR) for **non-potable end-uses**

Water in Australia

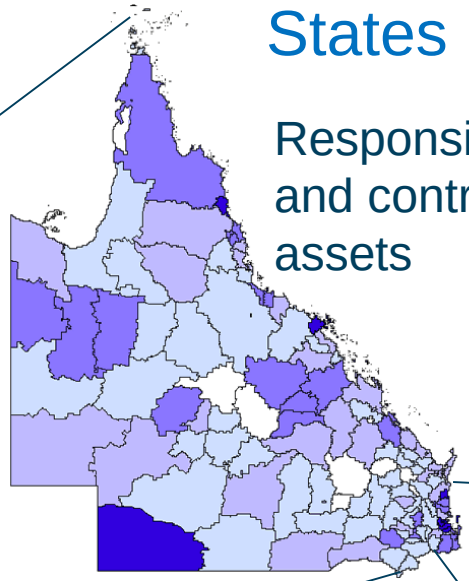
Commonwealth



Constitutionally not responsible for water

States

Responsible for water policy and control major water assets



Local Government

Can own built assets

Brisbane (2000)

Wivenhoe Dam

~100% Water Supply Capacity

Water Supply = 1,165 GL

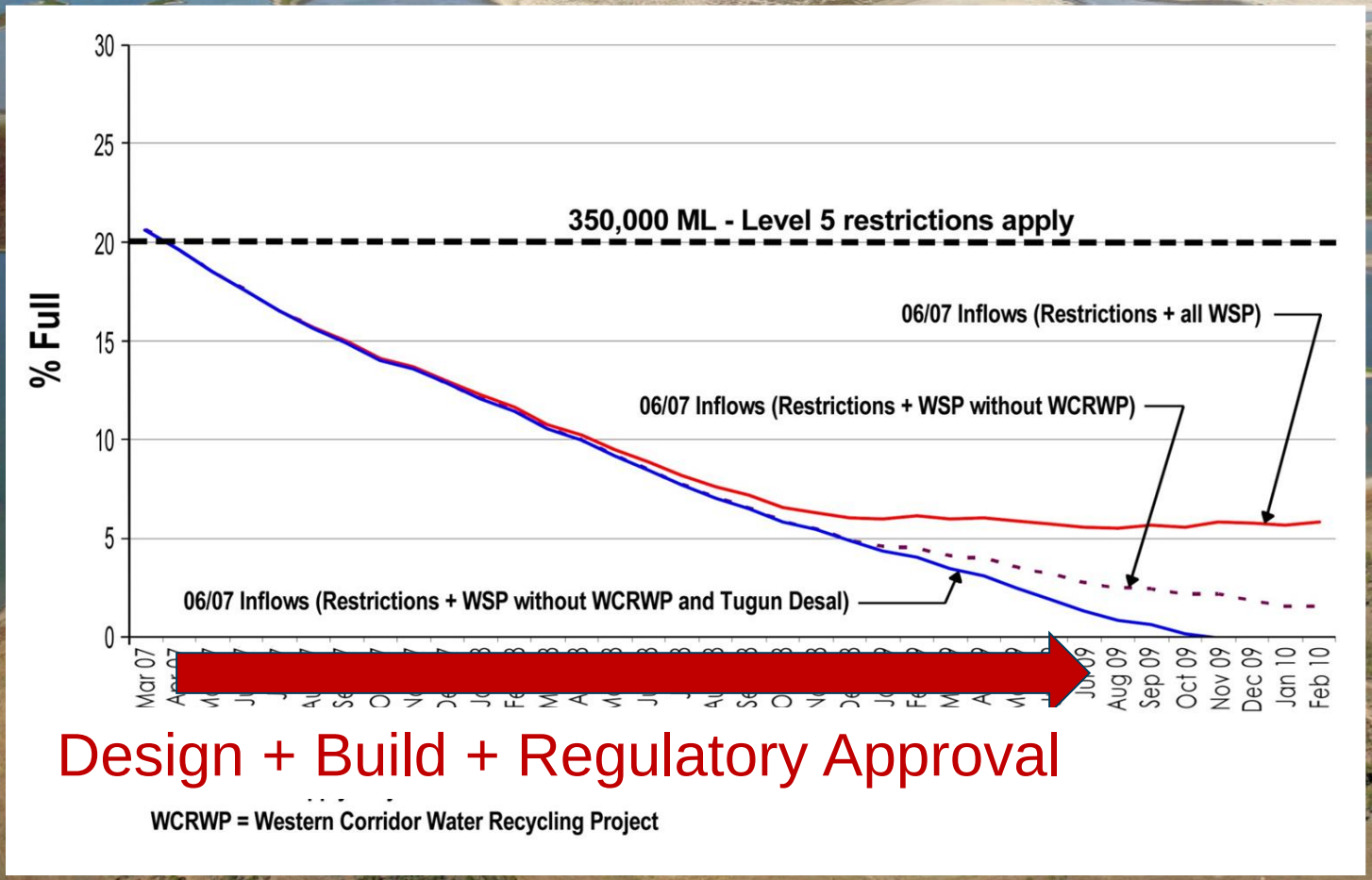
+ Flood Capacity = 1,450 GL

Brisbane (2007)

Wivenhoe Dam

~ 18% capacity

Spillway



Design + Build + Regulatory Approval

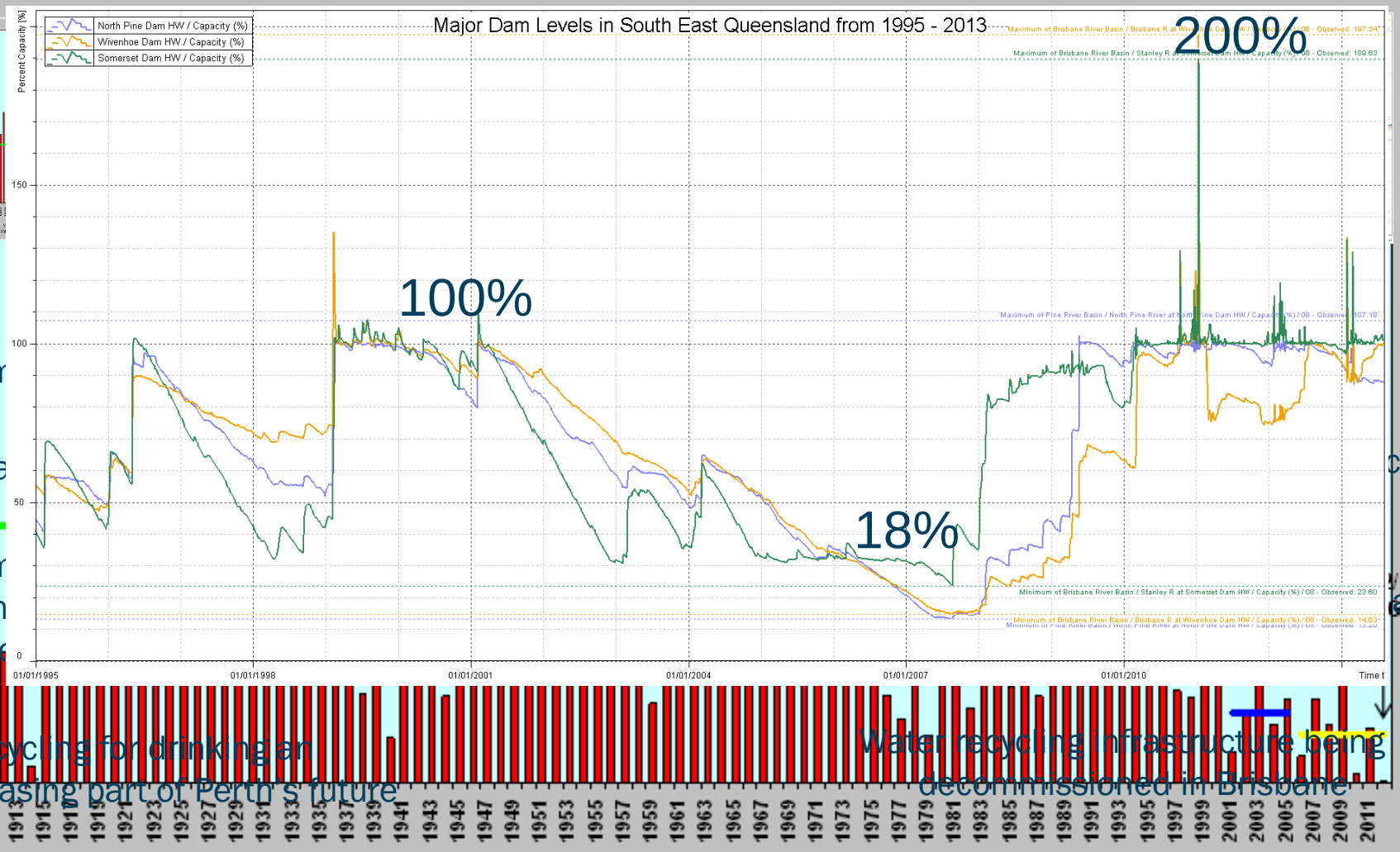
WCRWP = Western Corridor Water Recycling Project

Brisbane (2011)

Wivenhoe Dam

~ 200% capacity

Water Recycling for Drinking – a tale of two cities



Notes: * year is taken as May to April and labelled year is start (winter) of year
** Inflow is simulated based on Perth dams in 2001 i.e. excluding Stirling, Samson & Wokalup

12th June 2012

Centre R&D Goals

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Water360
Resources for Reuse

- Strong national water sector support for this initiative (WSAA, NWC, AWA, Utilities)
- R&D to support successful public engagement and address stakeholder concerns on water recycling for drinking
- Take advantage of major advances in water recycling for drinking in last 10 years
- Program drew on overseas and Australian expertise and experience to develop ‘Water360’ resources to help engage the community

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Water360 designed to:

- **Engage across all stages of the water planning process and all water sources** *(integrated urban water management)*
- **Engage around needs, benefits, risks and provide context for alternate supplies**
- **Support understanding of the broader water cycle to enhance understanding of water recycling**

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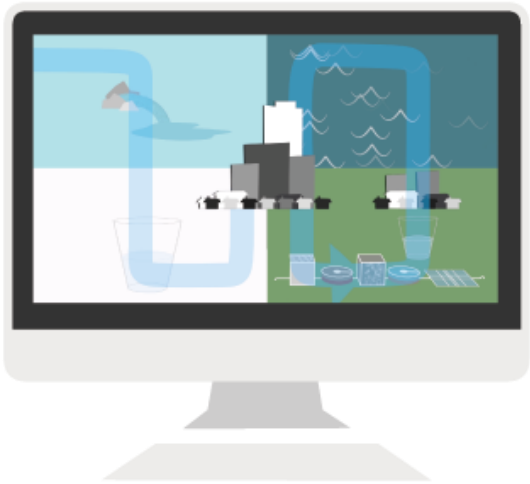
Testing Water360 products

10 minute video with short clips from three major products of the research program, tested in four Australian capital cities

A short excerpt from “The Water Cycle Explorer,” which is a 15 minute video that explores the complexity of the water cycle.

Samples from the Global Connections Map, an interactive map that highlights water use and reuse around the world.



“Water: Think and Drink” animation. This animation is one of six animations that explore a range of issues around our drinking water future.

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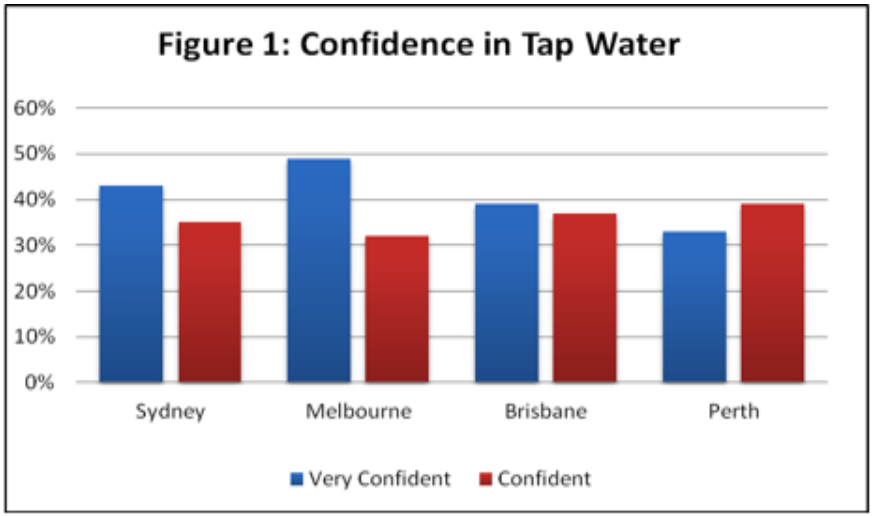
Confidence in Tap Water

In general residents of the four large Australian cities surveyed have high confidence that their tap water is safe to drink.



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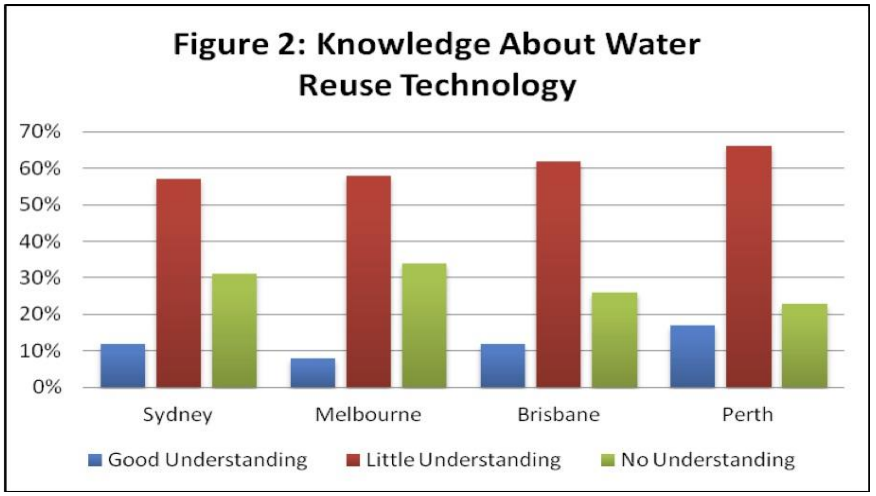
Knowledge about Technologies and Practices for Water Recycling

Respondents were asked if they thought they had a ‘good understanding’, ‘a little understanding’ or ‘no understanding’ about the technologies and practices related to augmenting drinking water with purified recycled water.



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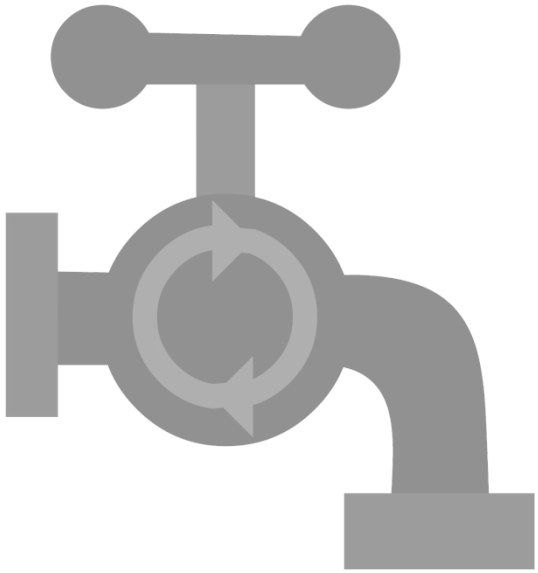
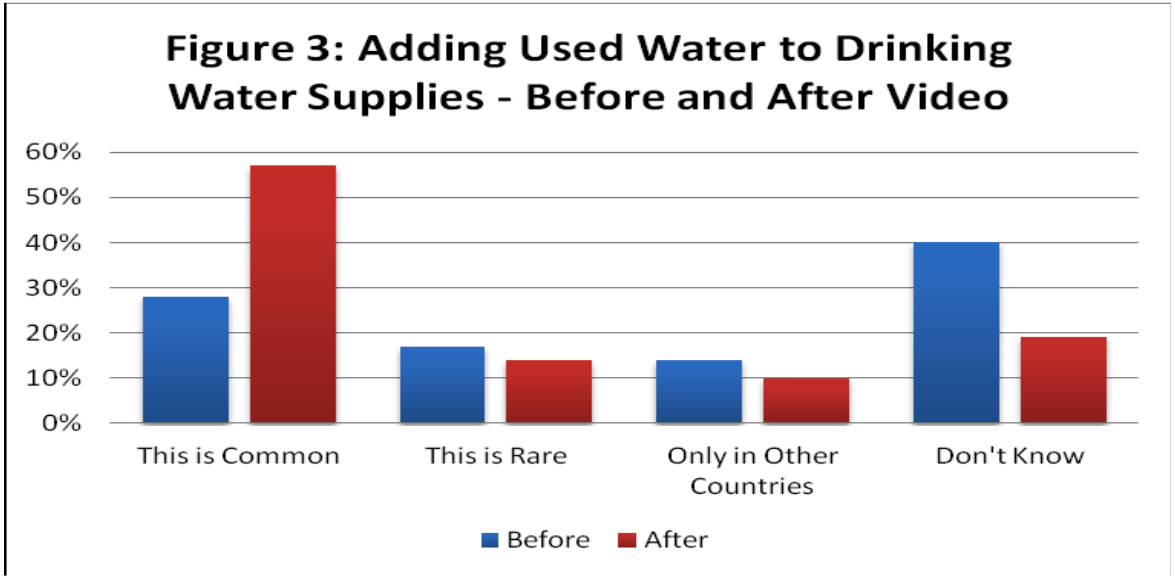
How Common Is it to Draw Drinking Water from Discharges of Previously used Water?

Before and after viewing the video, respondents were asked how common they thought it was that drinking water supplies were drawn from water sources that had received discharges from upstream communities, including agricultural and industrial uses.





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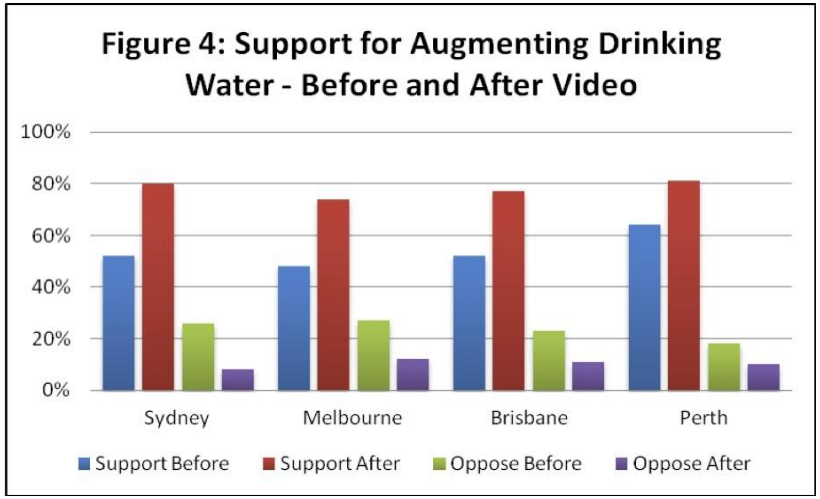
Support for Augmenting Drinking Water with Highly Treated Purified Used Water

Before and after viewing the video, respondents were asked for their level of support for augmenting drinking with purified water taken from used water sources.



Conclusions

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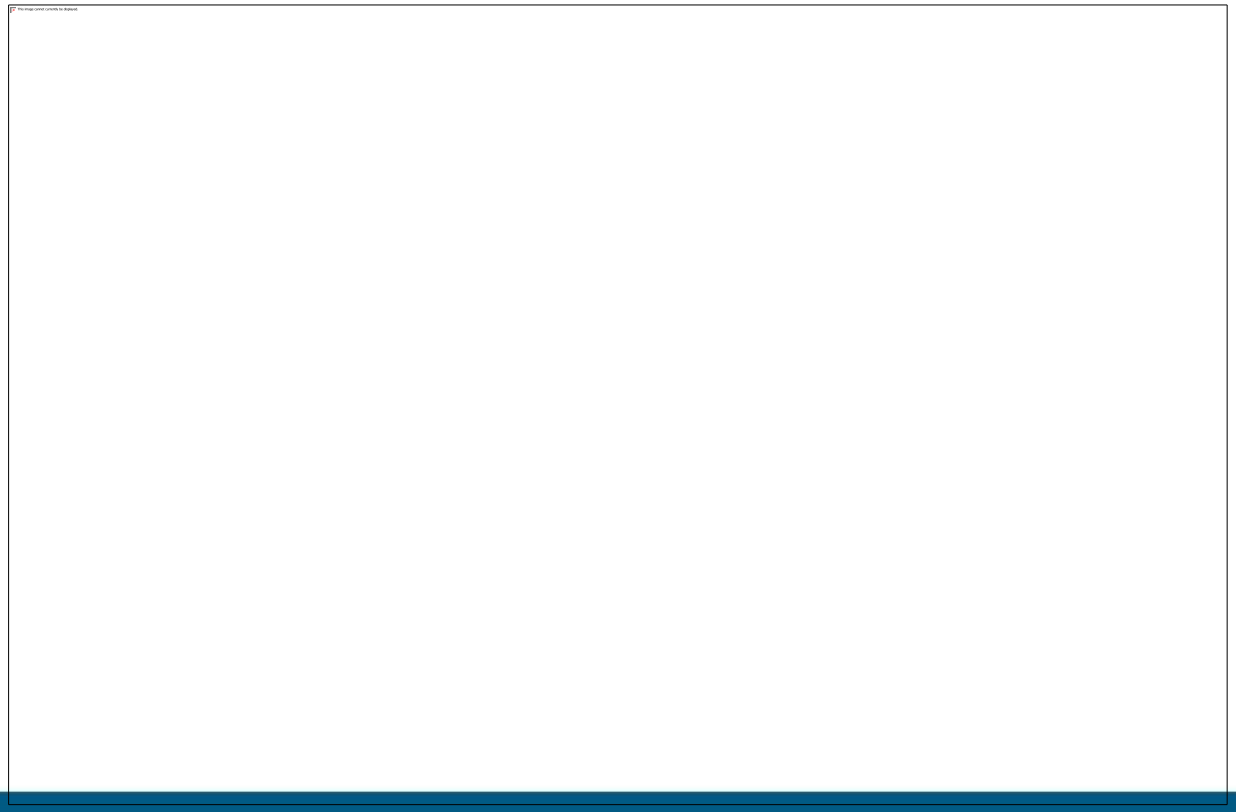
A small amount of information (i.e., 10 minutes of video) had the effect of raising support for augmenting drinking water with used water from 54% to 78% and reducing opposition from 24% to 10%.



Conclusions

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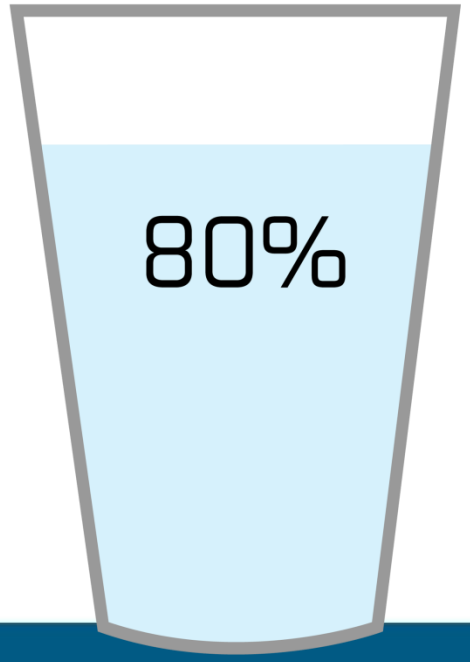
After seeing the video, trust in water reuse technology increased for 54% of respondents and trust in their utility increased for 49% of respondents.

After seeing the video, 80% of respondents said it was either ‘likely’ or ‘very likely’ that they would be willing to consider water recycling for drinking as a sustainable option for the future if conventional water supply sources were unavailable or extremely expensive?



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Summary

Start with the water cycle…

- Engage around needs, benefits, risks and provide **context** for alternate supplies
- ie. the community needs to understand the water cycle to understand recycling
- Engagement best led by trusted enterprise(s) and be apolitical

It will take time…

- Generally levels of knowledge on the water cycle are not high
- Sustained engagement is needed to raise awareness in industry and community
- Successful programs can take 5 – 7+ years

Expose the community to water recycling…

- All successful programs involved development of demonstration/education centres
- Demonstration (pilot plants) provide opportunity to trial technologies for water recycling
- Community engagement and support increases with ability to see water recycling technology in action, and with the experience of seeing the purified drinking water

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Thank you

contact us at…

www.australianwaterrecycling.com.au

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Additional Information

Academy of Technological Sciences & Engineering Report on Direct Potable Reuse

The Scope

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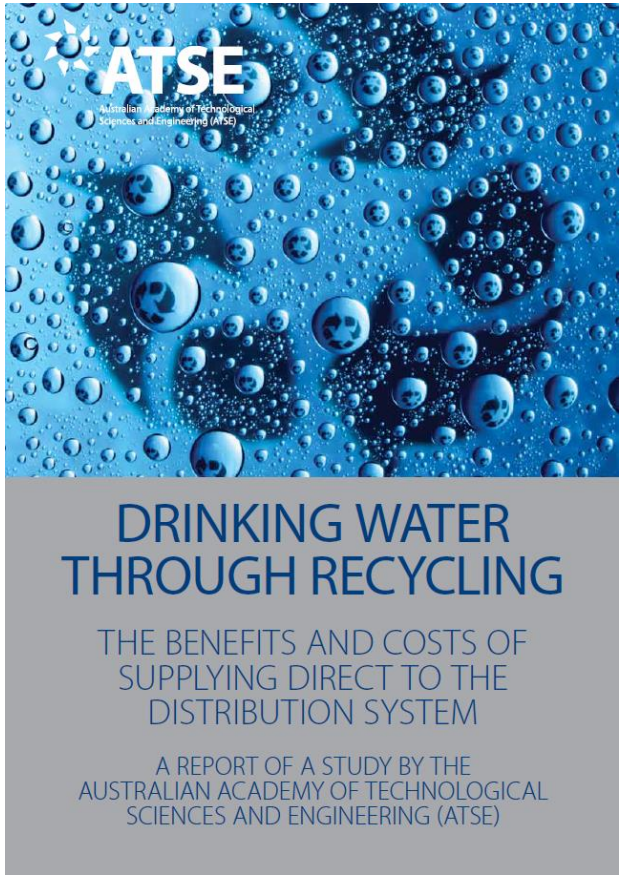
Project aim

- "*To define in objective scientific, economic and social terms, the potential place of recycling directly to the drinking water distribution system, in the spectrum of available water supply options*"

Target audience

- "*The report will be directed towards policy makers, regulators, researchers, the water industry at large and the consuming public*"



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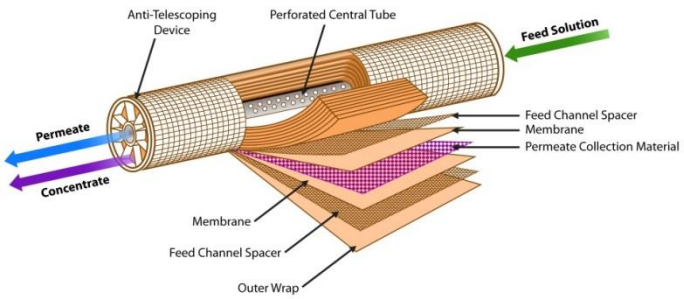
Contents of the report

1. Introduction
2. What is DPR and how does is work in practice?
3. The 'environmental buffer' of IPR: description and analysis of its role
4. International activities related to DPR
5. Identification of key issues: qualitative survey of Australian stakeholders
6. Water quality regulation in Australia and challenges posed by DPR
7. Health risk assessment and risk management
8. Cost, energy consumption and greenhouse gas emissions
9. Social acceptance of DPR
10. Conclusions



Cost, energy and GHG emissions

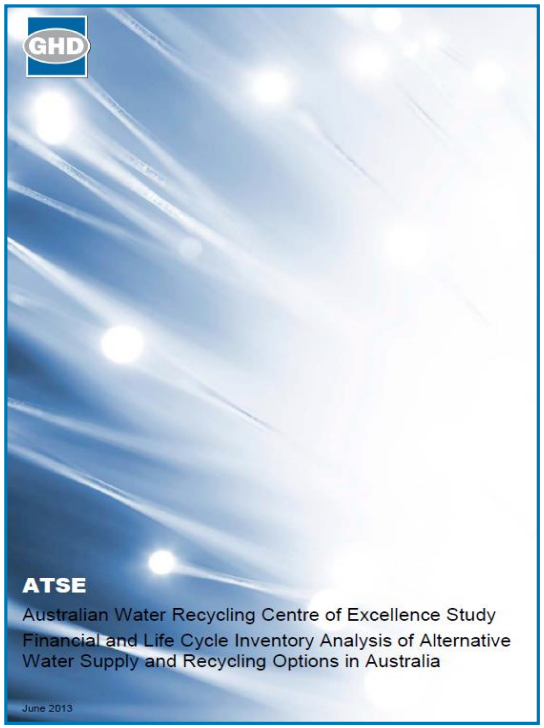
- Supplementary hypothetical case study
  - Undertaken by GHD (David De Haas, Greg Finlayson, et al)

Four scenarios based on alternative water supply options for a hypothetical coastal Australian city:

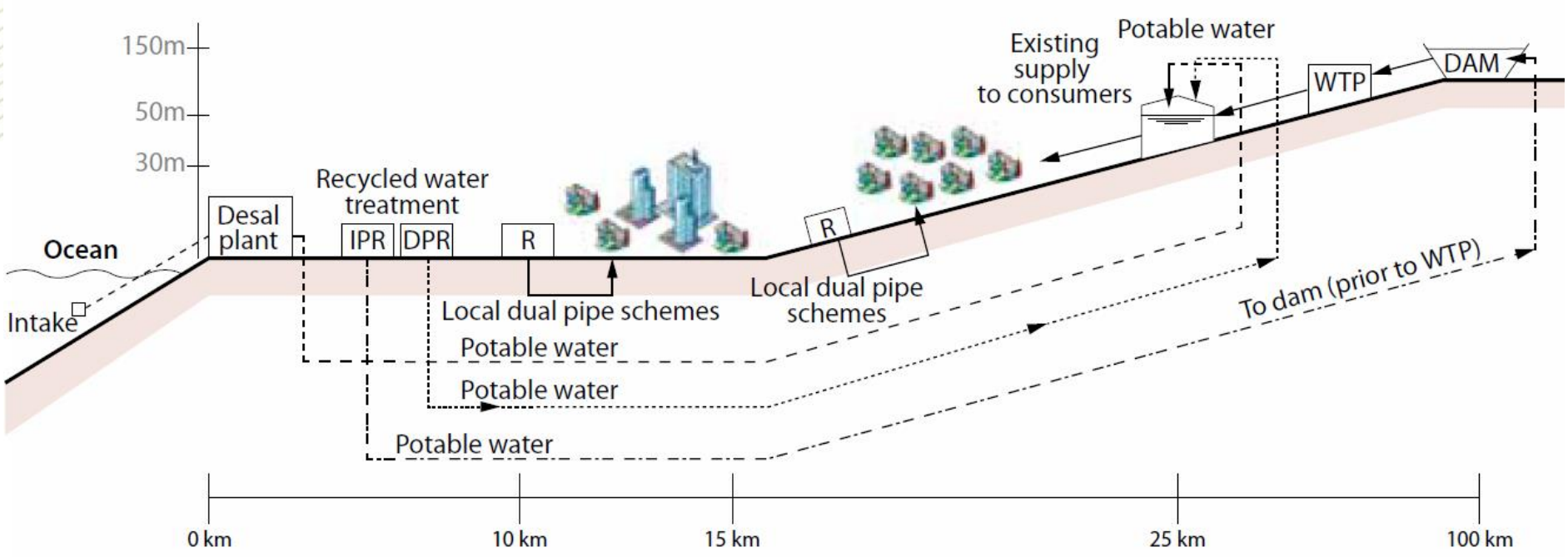
- Seawater desalination
- Indirect potable reuse
- Direct potable reuse
- Dual-pipe systems

Model (including uncertainty):

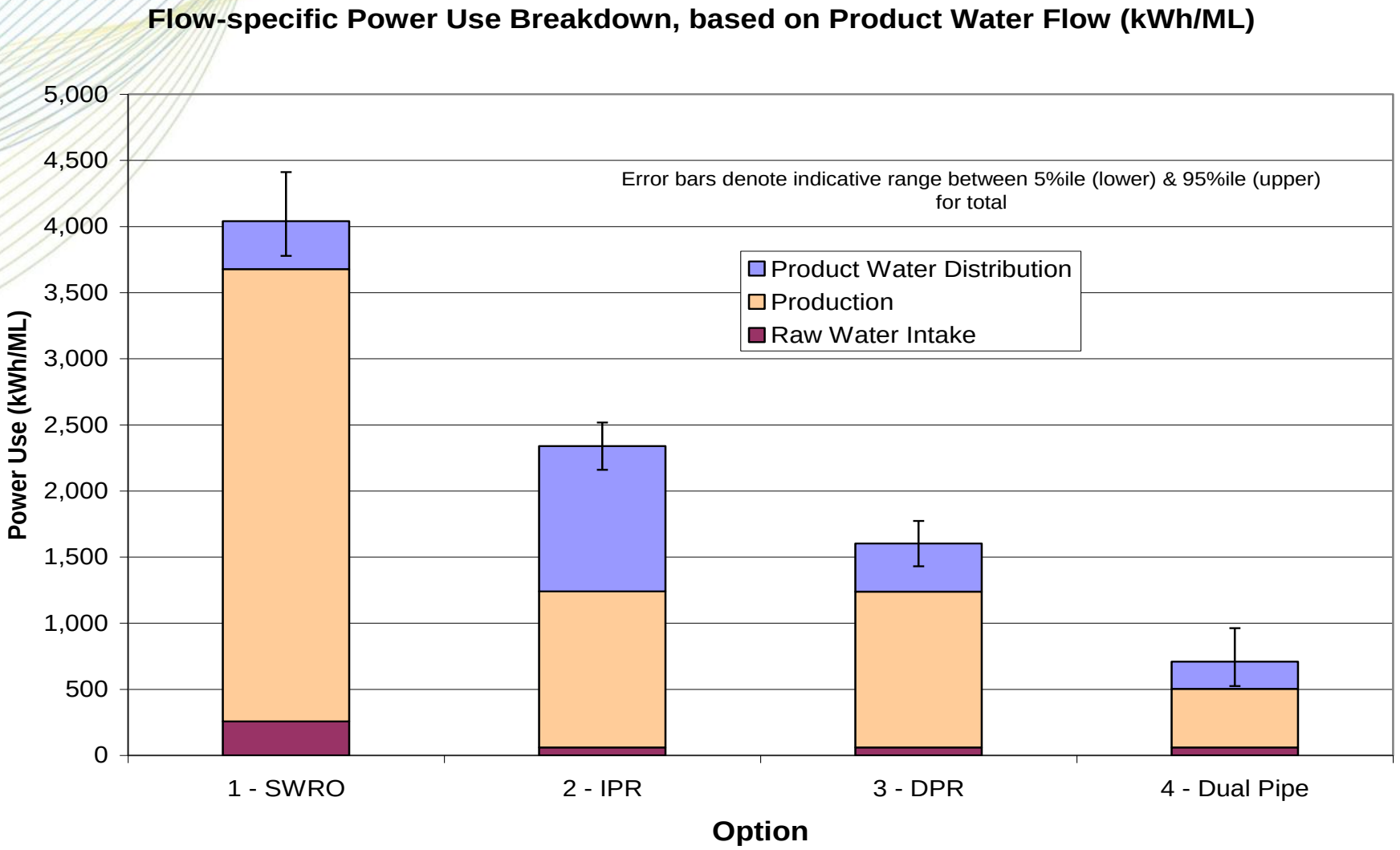
- Financial (capital and operating) costs
- Potential environmental impacts



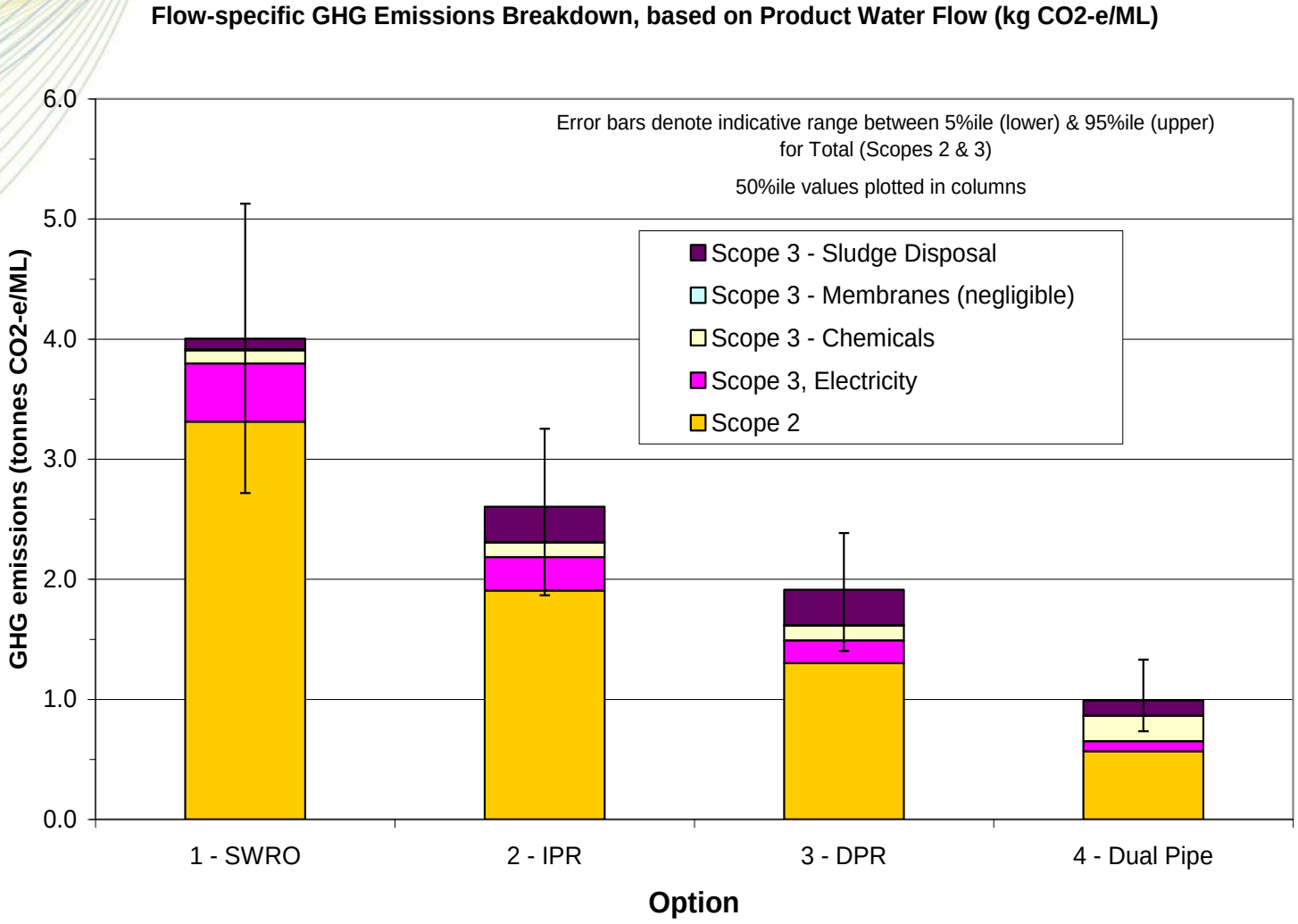
Cost, energy and GHG emissions



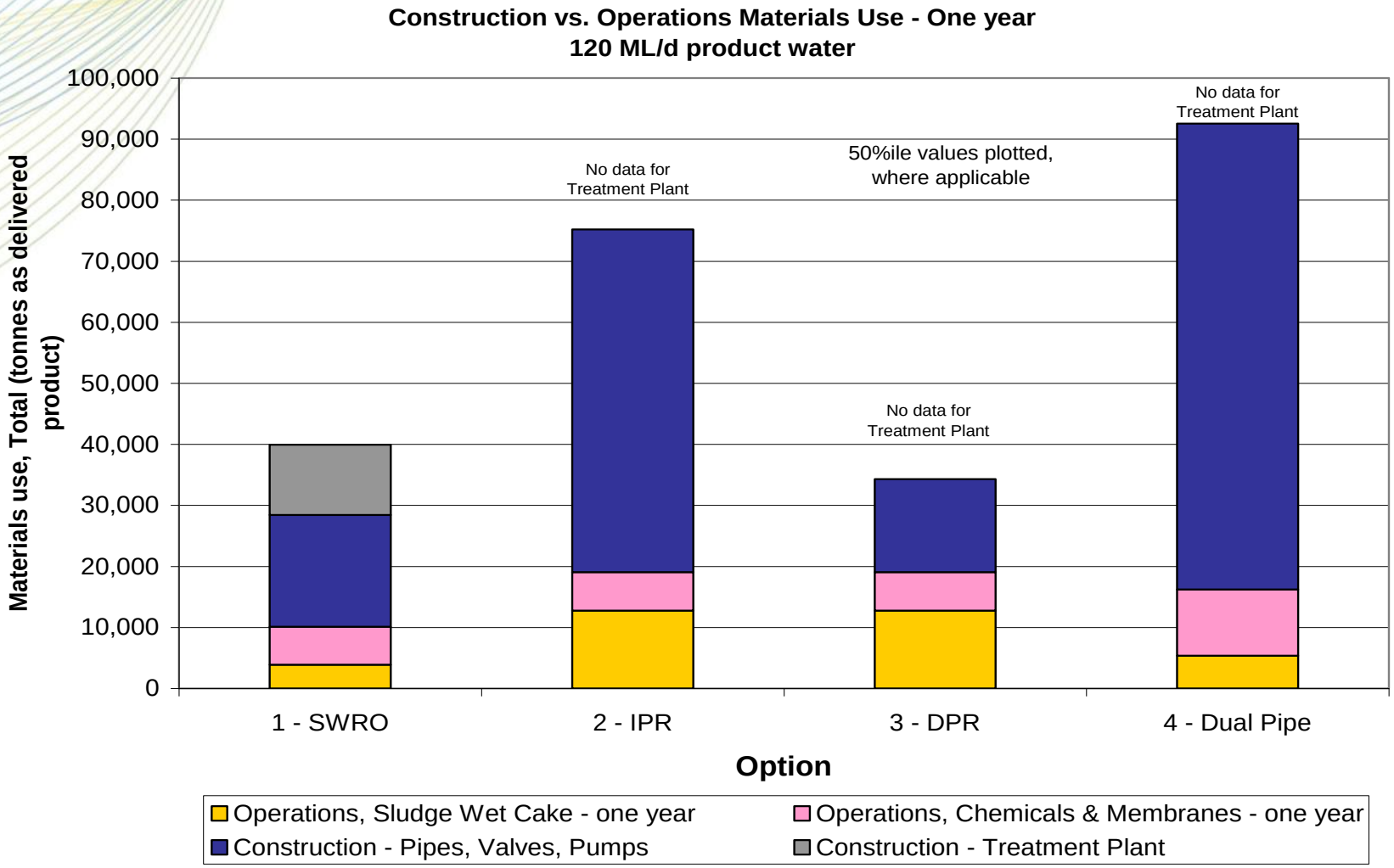
Power consumption



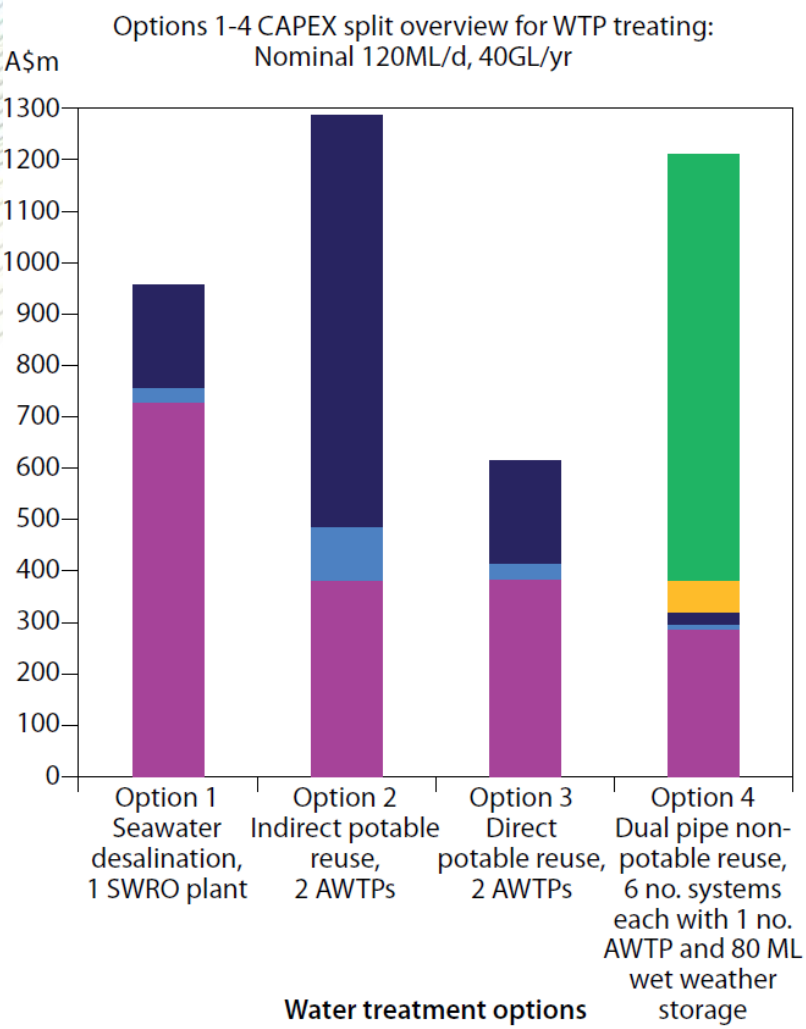
Greenhouse gas emissions



Materials use



Capital costs



- Dual pipe connections (pipework): assumes 330,000 connections at cost of $1700/connection
- Reticulation system infrastructure: cost associated with additional infrastructure required for dual pipe system only
- Transfer pipeline to supply point nominated
- Pumping station pumping to nominated elevation in distribution network
- Total plant cost

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Additional Information

Academy of Technological Sciences & Engineering Report on Direct Potable Reuse


Brisbane
Alice Springs
4000 km
Perth
Adelaide
Sydney
Melbourne