Centre for Water Technology and Policy
The University of Hong Kong

UNSW
THE UNIVERSITY OF NEW SOUTH WALES

Water Reuse in the US & Australia: Obstacles & Solutions

Australia's journey towards integrated urban water management:
Past achievements and future prospects for water reuse.

Never Stand Still | Faculty of Engineering | Global Water Institute

Today's Agenda

Today we explore two perspectives on the adoption of water reuse as a policy option for ensuring urban water security in Australia.

Perspective 1 – The evolution of solutions to technical and institutional barriers

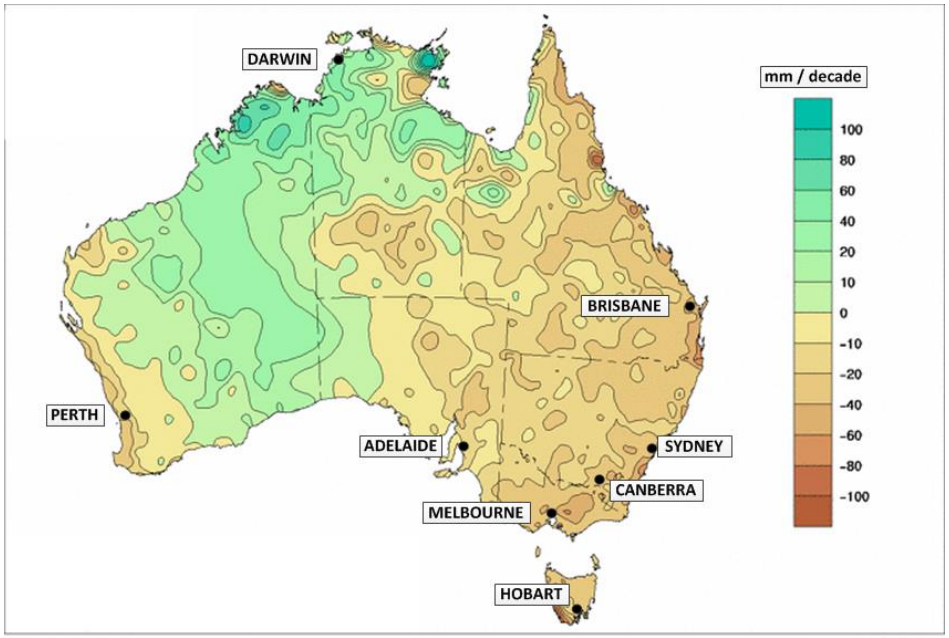
Perspective 2 - The challenges of geography, demographics and uncertainty

Today we will look at:

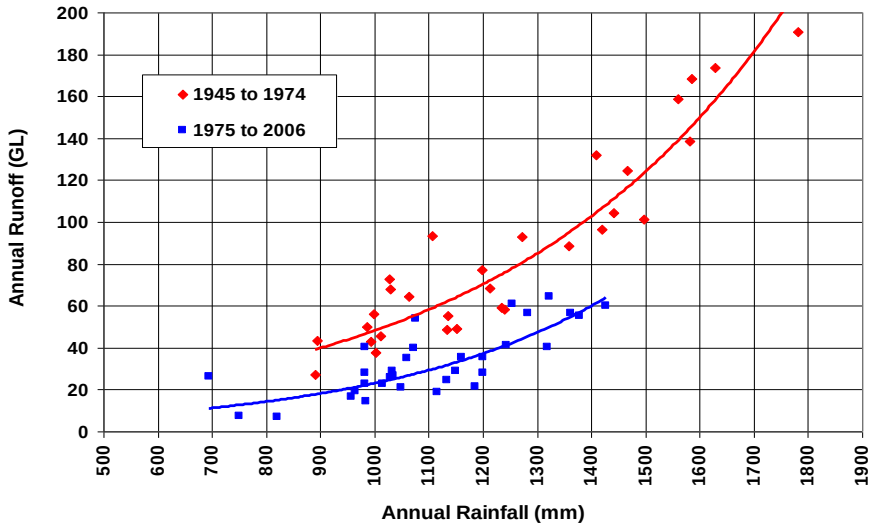
- Milestones in the growth of water reuse in Australia
- Typical concerns around water reuse: Water quality risks, financial risks & acceptance
- Climate change (effects & mitigation)
- Alternative supply options
- Flexibility (avoid policy conflicts)

Why Australia needs to develop alternative urban water supplies

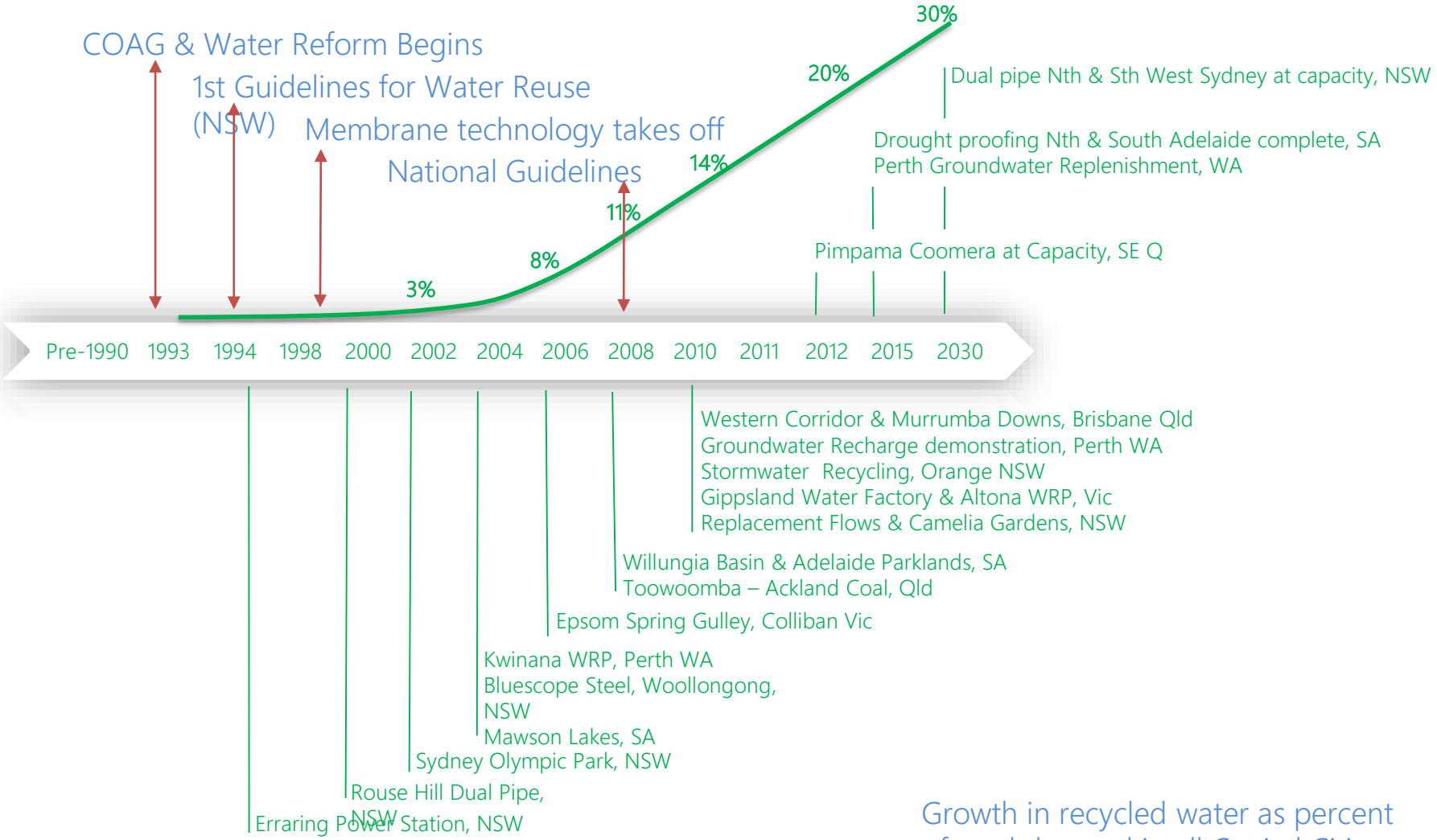
- 90% population within 80km of coast
- Coastal cities supplied by surface water from inland catchments
- A 10% decrease in rainfall results in a 30% reduction in run-off



South-West
(Perth, Serpentine)

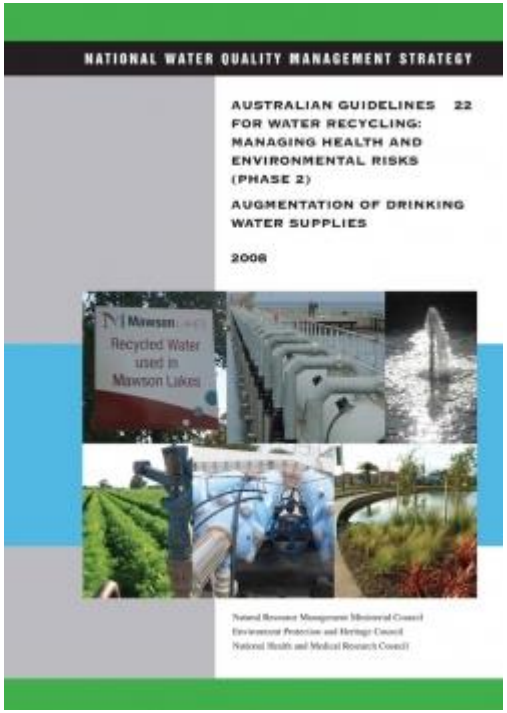


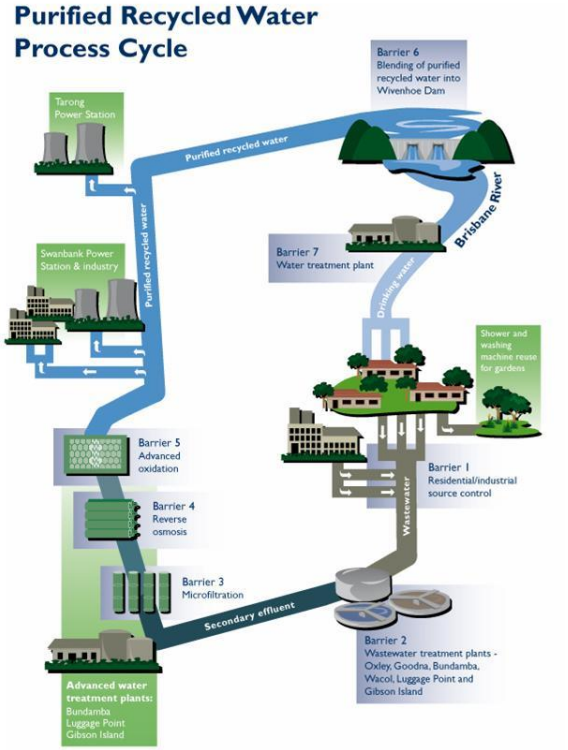
Perspective 1: Technical and institutional solutions for water reuse

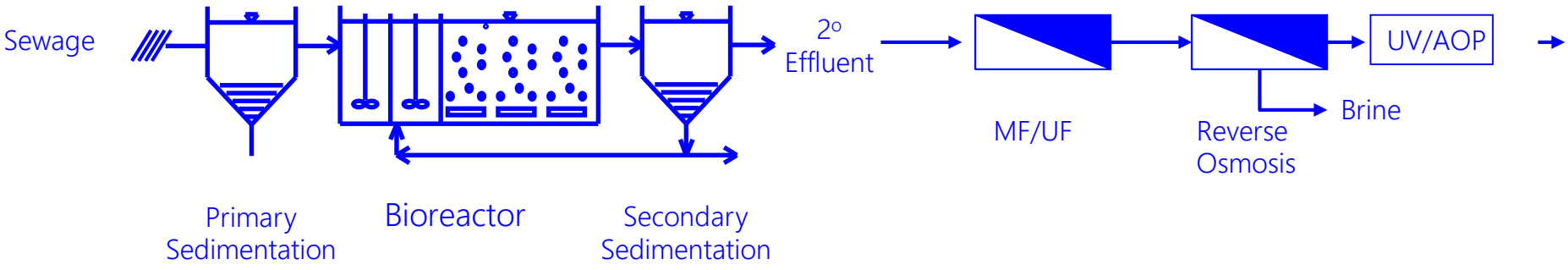


Growth in recycled water as percent of total demand in all Capital Cities

Perspective 1: Build on existing infrastructure: proven technology: national guidelines

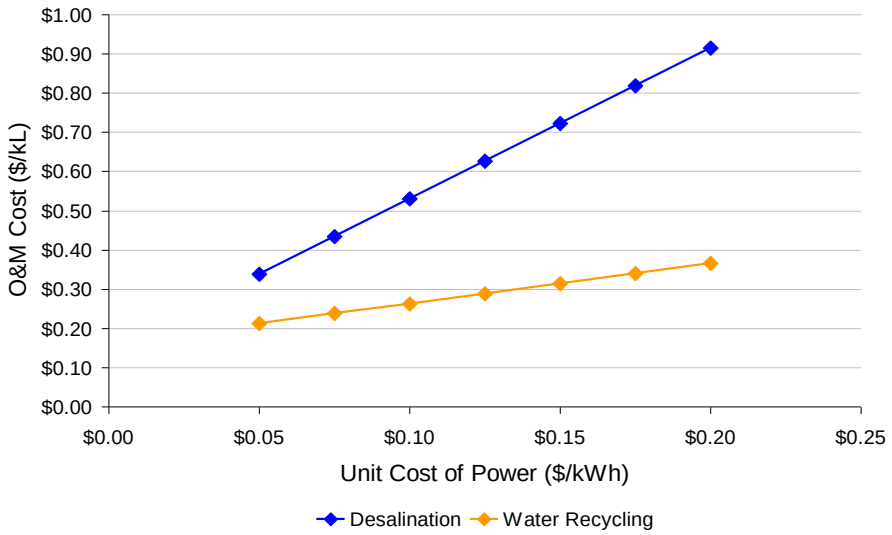






Perspective 2: The challenges of geography, demographics and uncertainty

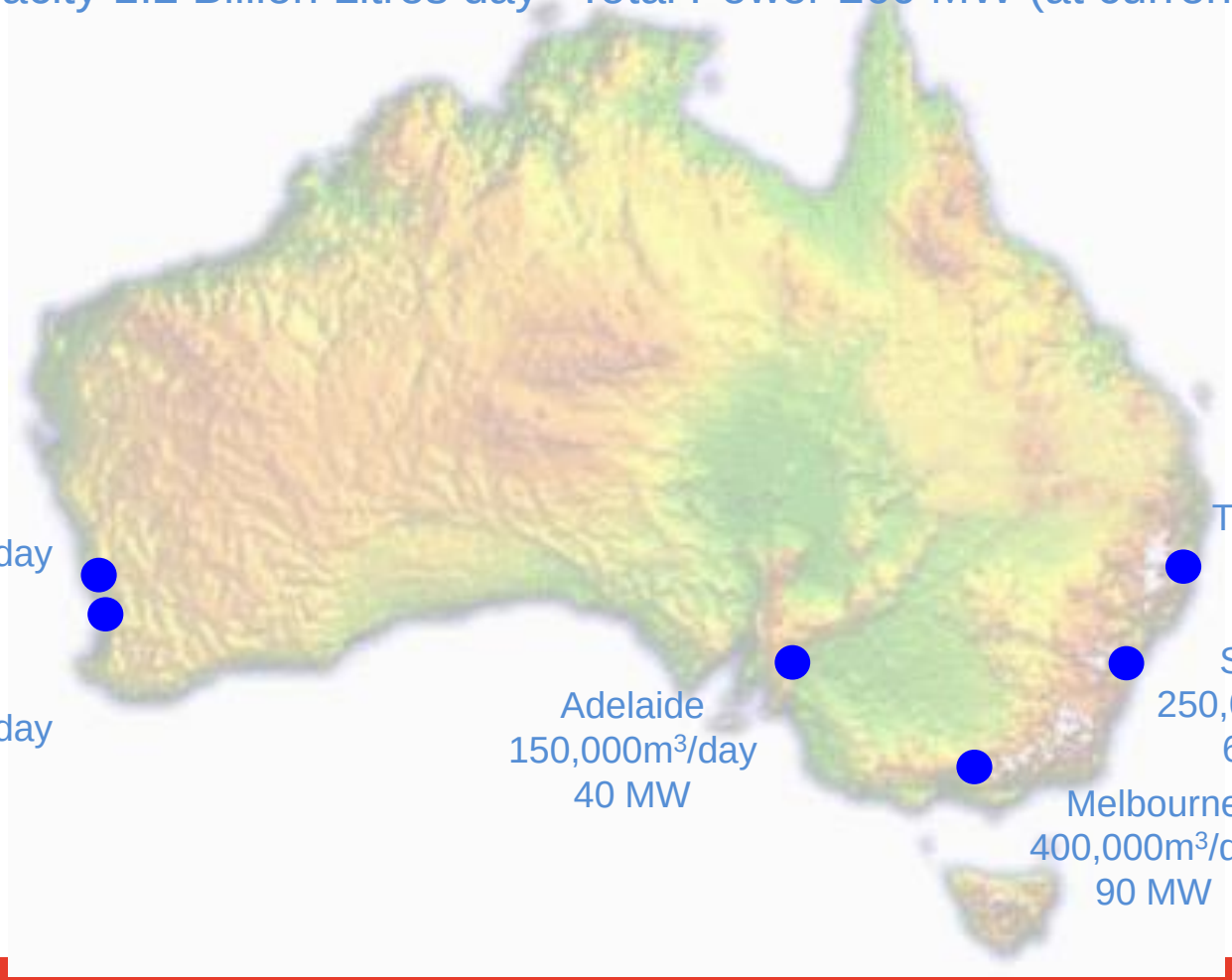
1. The emphasis on how water is used and the value of water
2. Structural changes in economy (closure of refineries and other industrial water users)
3. Indirect potable reuse verse direct potable reuse (Public acceptance)
4. Alternative supplies (Desalination)
5. How are cities designed (Stormwater)



Perspective 2: The challenges of geography, demographics and uncertainty

Desalination capacity in Australia grew from 5 GLA before 2004 to over 500 GLA by 2012

Total capacity 1.2 Billion Litres day^{-1} Total Power 260 MW (at current capacity)



Maximise use of existing infrastructure has merit

THE STRAITS TIMES

122 PAGES IN FIVE PARTS » MICA (P) 083/03/2005 WEDNESDAY, SEPTEMBER 14 2005 A SINGAPORE PRESS HOLDINGS PUBLICATION ESTABLISHED 1845 » 80 CE

Seawater fit for drinking now a reality

PM hails milestone in history of S'pore's water supply'

BY LYDIA LIM
Senior Political Correspondent

PHOTO: TERENCE TAN

OPENING TOAST: In tune with the celebratory mood, fireworks lit up the sky over Tuas as Mr Lee completed a tour of the plant with (from left) PUB chairman Tan Gee Paw, Environment and Water Resources Minister Yaacob Ibrahim and Hyflux's Ms Lum. The bottles have labels saying "Desal H2O".

Recycling decreases the volume of water required by community because it builds on existing infrastructure!

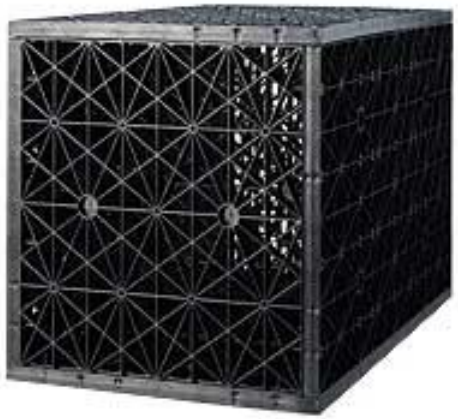
Singapore's Water Situation (Dominic Nathan Straits Times, 2006)

1996 Water Plan	By 2005
6 desalination plants • Tuas (x2) • Changi • Pulau Tekong • Jurong Island • Pulau Busing	4 Recycling plants • Bedok • Kranji • Seletar • Ulu Pandan 1 Desalination Plant • Tuas

Maximising stormwater capture has merit

What is the role of stormwater capture

- Aquifer recharge
- Drainage
- 1024 m^2
- Percolation rate 900L/m^2/h
- Storage 1.5 ML
- Water recovered through groundwater

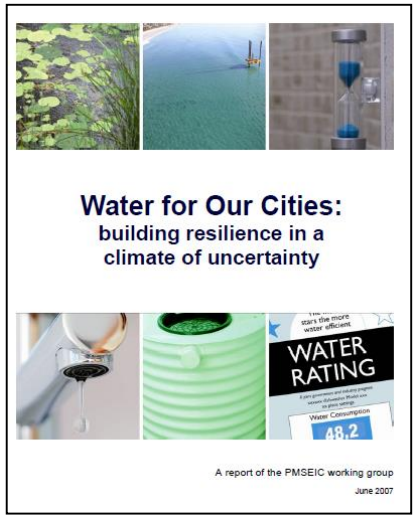


What is the greenhouse component of each option ($kgCO_2/m^3$)

	Desalination	Recycling	Storm water
Power	6.2	1.7	0.4
Chemicals	0.22	0.16	-
Membranes	0.12	0.09	-
Materials	0.12	0.09	0.05
Total	6.52	1.95	0.45

Conclusions: Urban water reform is still a work in progress

June 2007

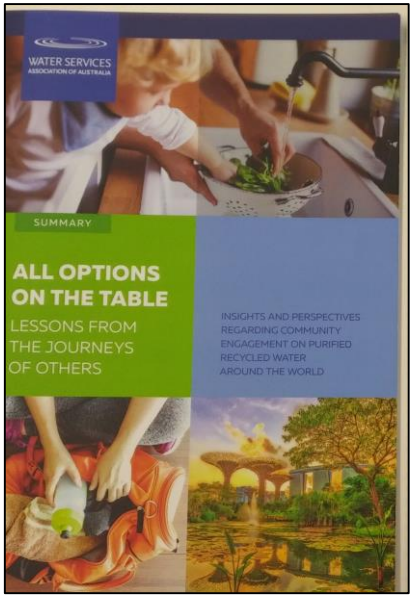


6 Recommendations Planning for Uncertainty & Managing Uncertainty

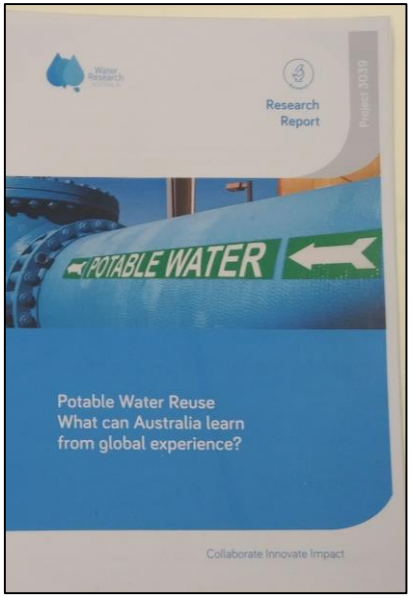
1. Risk based planning to build optimum portfolio for each city
2. Strengthening incentives through pricing and property rights
3. Build community trust by understanding community aspirations, values & concern
4. Encouraging investment in strategic opportunities
   - A) by targeting research on urban water issues
   - B) by establishing a network of demonstration projects of alternative water supply systems and use the network to provide comparative data
5. Upskilling to build capacity for industry development
6. Driving innovation
   - A) By reducing fragmentation and enhancing communication between relevant regulatory authorities.
   - B) By establishing a set of mandatory minimum standards for water efficiency

Policy achievements to date:

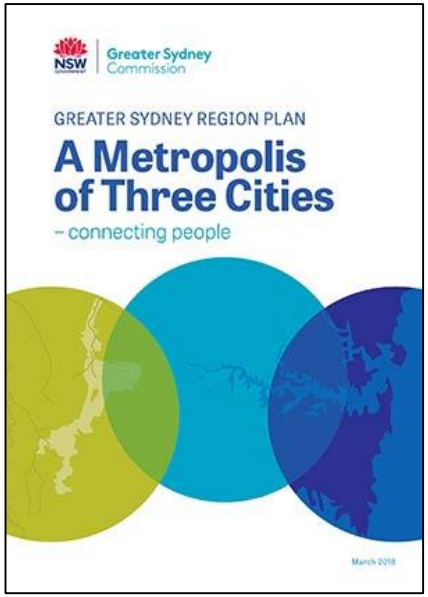
3 Community & Trust



4 Strategic Investments



6 Development
6 Fragmentation



Thank you