

INSTITUTE FOR SUSTAINABLE FUTURES

# Integrated Resource Planning: How do we know if our water planning & management is best practice?

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# Presentation overview

- > **Integrated Resource Planning (IRP)**
  - history
  - the IRP Framework
- > **Demand management**
  - investment in IRP & demand management
  - still gaps
- > **Benchmarking**
  - Madrid case study
- > **Conclusions**



# Integrated Resource Planning (IRP) - a brief history

**In the 1980s the energy industry in the US recognised**

- > they were using a narrow supply-side focus for infrastructure planning**
- > missing opportunities to make existing networks more productive through efficiency**
- > concept of IRP born where supply and demand-side options seen as equally important & assessed along side each other**

# **Integrated Resource Planning (IRP) - a brief history**

**In the 1990s used in parts of the US water industry**

**Recognised that**

- > detailed demand forecasting (end use analysis) and assessment of conservation potential important**
- > need to emphasize value of water efficiency/demand management options**

**By the mid 1990s IRP (also sometimes known as Least Cost Planning)**

- > starting to emerge in Australia**
- > used to emphasize value of water efficiency/demand management options**

# Integrated Resource Planning (IRP) - History

## Now IRP

- > has been applied across many cities in Australia over the last 15 years resulting in significant investment in demand management
- > currently IRP used in US, UK and Australian water industries
- > recognised as a best practice approach
- > used as the foundation of peer reviewed frameworks developed for
  - the International Water Association (IWA) - the IDMF
  - the Water Services Association of Australia (WSAA) - Guide to DM
- > will be the foundation of a major new NWC project

# The IRP Framework

**Step 1 - Plan the overall process**

**Step 2 - Analyse the situation**

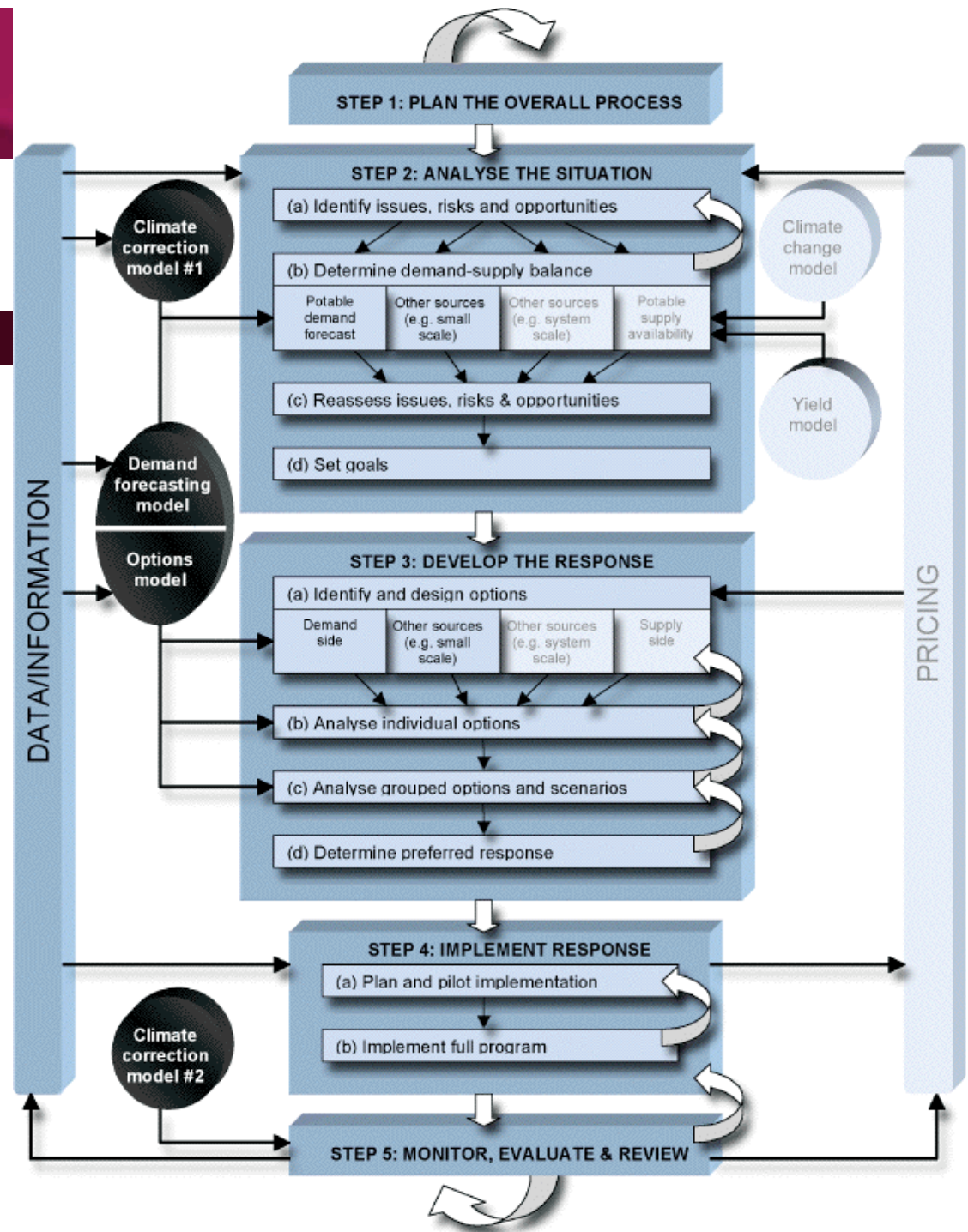
- > determine issues/drivers
- > forecast water demand accurately
- > determine the supply-demand balance

**Step 3 - Develop the response**

- > develop options
- > assess options

**Step 4 - Implement the response**

**Step 5 - Monitor, evaluate & review**

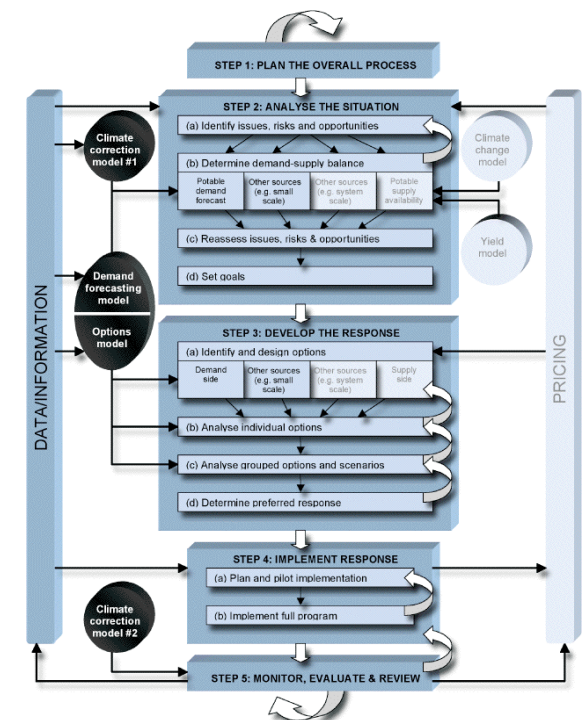


# Demand Management

Major activity and investment in IRP and demand management programs in Australia

However, full and thorough application is rarely done due to external pressures, timing, budget constraints.....

- > Tendency to undertake ad hoc elements of the IRP framework
- > Risk of over investment in components of IRP without understanding the full picture
- > Risk of over investment in demand management that is not cost effective and/or does not save water



# Benchmarking

**Benchmarking can be a useful process to**

- > help utilities that have already worked through the IRP process to test whether they have applied each step appropriately**
- > aid those new to the process to take stock of what components of the process they already do**
- > take stock of whether utility is seeing the whole planning context**
- > question if investing appropriately in various components of the planning process**
- > understand where they are at and what they need to do to move towards best practice water planning and management**

# Benchmarking

As part of IWA IDMF project

- > **Developed the IRP framework and “best practice” criteria**
  - **what does best practice water planning look like**
  - **how would you know (examples)**
  - **applicability at different levels (strategic versus detailed, data rich versus data poor)**

Step	Criteria (What does best practice look like?)	Relevant objective (Why this criteria?)	Example of best practice processes (first pass level)	Examples of best practice processes (detailed level)
<b>Overall process</b>				
	Includes all steps in a logical sequence	To ensure integrity of the approach	As a minimum, carries out all the steps in a simple form.	Conducts each step to the greatest depth possible.
	Uses a depth of analysis that is fit for purpose	To avoid unwise investment in particular steps	Use of resources invested in different steps is decided explicitly rather than by default	Gives consideration to the value of investing more in particular steps by having undertaken research/gap analysis that clearly identifies the benefit of the outcome of the additional resource investment.
	Treats demand, source substitution and supply options equally	To promote equal consideration of all the possibilities/options that might improve the supply-demand balance. To ensure consistent comparison of all options.	As a minimum, considers both supply and demand management options alongside one another. Uses the same boundaries and assumptions and assesses options against a common set of objectives or goals.	Also considers source substitution options at various scales (e.g. large scale, community scale and household scale) alongside supply and demand management options.
	Is used iteratively and reflectively	To adjust to inevitable change To ensure the process and outcomes are refined through increased knowledge.	As a minimum, conducts a first pass through all steps and reflects on each of these.	Feeds detailed monitoring and evaluation information back appropriately into various steps of the planning process.
	Maximizes inclusiveness	To ensure representation of different perspectives To improve acceptance of the planning process and ownership of its outcomes To assist in enabling a common vision	Includes various departments within for example a water service provider undertaking the process (e.g. water supply strategic/operational depts, demand management, sewerage, stormwater) using as a minimum consultation of some sort	Includes, in addition: Regulatory agency, environmental agency, land use planning agency, community representatives etc. Identifies a core steering group with consistent members to maximize ease of process application.

# Benchmarking

- > Test the framework & criteria on a large utility (Madrid)
- > Develop a benchmarking process
- > Use the benchmarking process on Canal de Isabel II (CYII) the Madrid water utility (serving over 100 municipalities)
- > Help CYII to take stock, identify gaps and determine how to move towards best practice

STEP 1: PLAN THE OVERALL PROCESS	STEP 2: ANALYSE THE SITUATION	STEP 3: DEVELOP THE RESPONSE	STEP 4: IMPLEMENT RESPONSE	STEP 5: MONITOR, EVALUATE AND REVIEW
<p>Planning with respect to risk has been well-considered.</p> <p>Coordinated planning of demand-side along with supply-side options has not been carried out.</p> <p>Only parts of the IDMF process have been covered in the current overall planning approach.</p> <p>Potential to involve more stakeholders and use deliberative decision-making approaches.</p>	<p>Overall water distribution system is well-understood.</p> <p>Detailed analysis of residential and commercial sectors has been conducted and some analysis of residential end-uses.</p> <p>A consistent system boundary for assessment needs to be set.</p> <p>A process to assess risks, opportunities and issues and define planning goals is required.</p>	<p>Only supply-side options have been considered apart from water losses management and preliminary estimates of a limited number of demand-side options.</p> <p>Demand management options need to be identified and designed.</p> <p>A consistent economic analysis method (including sensitivity analysis) needs to be used to determine the options (supply and demand-side) with least cost to society.</p> <p>Other social and environmental criteria need to be considered consistently for both supply and demand-side options.</p> <p>Optimisation of risk-reduction across a selection of options needs to be investigated.</p> <p>Cost sharing arrangements with other stakeholders need to be investigated.</p>	<p>Procedures for implementation of leakage management have been well-implemented.</p> <p>A residential demand management pilot program has been completed.</p> <p>Additional pilots of chosen demand management options are required, followed by their full-scale implementation.</p>	<p>Cost-effectiveness of leakage strategies has been assessed.</p> <p>Evaluation of the residential pilot is intended.</p> <p>Appropriate monitoring, evaluation for all options (pilot and full-scale) implemented will be required.</p> <p>Repeated review of the overall planning process in the light of best practice is required.</p>

KEY:



Considerable amount of work aligned with best practice has been done in this area.



Some evidence of best practice methods, but further work required to realise the benefits of an overall best practice approach.



Little evidence of a best practice approach in work conducted to date.

# Benchmarking

- > **Used combination of:**
  - in depth interviews
  - CYII internal publications
  - CYII external publications/papers

STEP 1: PLAN THE OVERALL PROCESS	STEP 2: ANALYSE THE SITUATION	STEP 3: DEVELOP THE RESPONSE	STEP 4: IMPLEMENT RESPONSE	STEP 5: MONITOR, EVALUATE AND REVIEW
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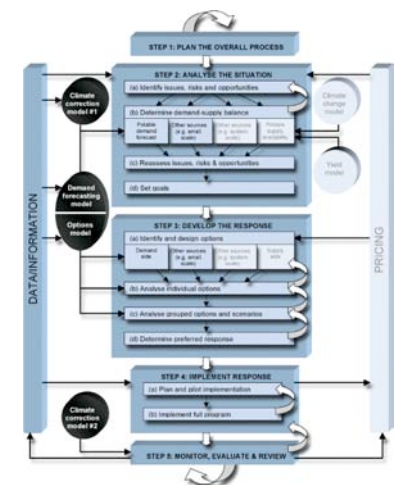
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# Conclusions summary

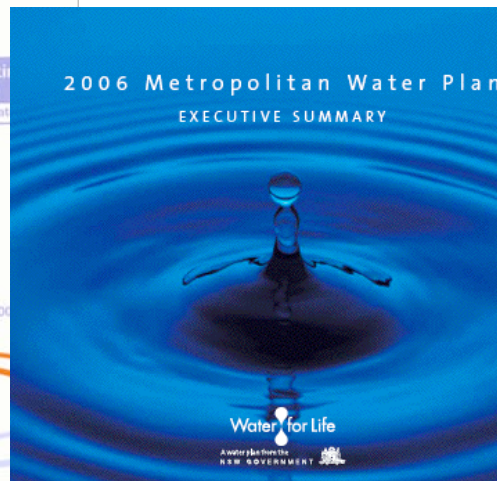
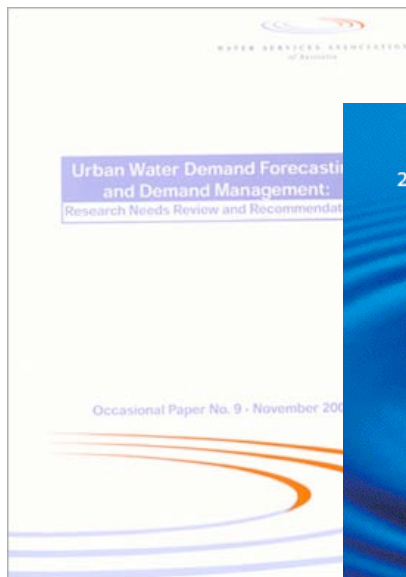
- > We have an internationally peer reviewed water planning framework already applied in many parts of Australia
- > Need to be careful that it is applied comprehensively
- > Need to make sure tools are widely available
  - WSAA Guide to Demand Management & IRP
  - ISDP model
  - training materials
  - national end use database
- > Benchmarking needed to ensure comprehensive application of IRP framework and aid utilities to move to best practice water planning



# Further information

<http://www.isf.uts.edu.au/>

<https://www.wsaa.asn.au/frameset2.html>



The International Demand Management Framework  
Stage 1  
Final Report

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Prepared by  
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For  
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