



Ministry of Land, Infrastructure, Transport and Tourism, Japan

Benchmarking in the Australian Water Industry

19th February 2013



Presentation Structure

- Presentation Objective:
 - To provide an overview of benchmarking within the Australian water industry.
- Structure of the Presentation:
 - Why Benchmark?
 - A Brief History of Benchmarking in the Aust. Water Industry
 - Case Study 1 (Metric Benchmarking)
 - National Water Commissions Performance Indicators
 - Case Study 2 (Process Benchmarking)
 - Water Services Association of Australia Aquamark framework
 - Closing Comments
- Questions.





Why Benchmarking?





Why Benchmark?



- Drivers:
 - To measure and monitor performance:
 - At the industry level (is our industry globally competitive?)
 - At the business level (how does my service provider compare with its peers)
 - To act as a “long range radar” by identifying problems before they develop:
 - At the industry level as well as individual business
 - To minimise/manage Risk:
 - Australian Commonwealth and State governments have been concerned that a developing asset renewal liability may become an issue of state or national significance if not managed properly



Approaches to Benchmarking

Different Approaches	Focus	Scope	Advantages	Limitations
Internal How can we improve?	Comparison WITHIN an Individual Business	Undertaken by a business as a means of measuring change (improvements / deterioration) in business activities over time	<ul style="list-style-type: none">• Flexible, cheap and repeatable• Can be developed to meet a specific need of the business	<ul style="list-style-type: none">• Doesn't provide information on what others are doing in the industry or whether the business is efficient in doing the benchmarked activity
External Benchmarking How do we compare <u>with our peers</u>	Comparison BETWEEN business	Business benchmarks its performance against its peers using a set of standardised metrics	<ul style="list-style-type: none">• Provides useful information on the relative performance of the business• Identifies those businesses who are performing well and from which others may learn	<ul style="list-style-type: none">• Needs agreement on scope of benchmarks• Needs clear definition on measurement of BM• Prone to misinterpretation
Industry Benchmarking How do we compare with other industries	Comparison across the industry	Used (in Aust) by State and Commonwealth governments to assess industry performance and potential long term liability	<ul style="list-style-type: none">• Provides an indicator of the industry efficiency	<ul style="list-style-type: none">• Needs agreement on scope of benchmarks• Needs clear definition on measurement of BM• Prone to misinterpretation



Brief History of Benchmarking in the Aust Water Industry





Brief History of Benchmarking in Australian Water Industry:

In the beginning...

1990-1991: Severe recession

1993: Productivity Commission report on competitiveness of Australian industry

1994: Agreement between Commonwealth and State government for comprehensive reform of many industries (incl water)

Establishment Phase:

1995 – WSAA was established to represent the interests of largest (28) water businesses

1996: First “WSAA Facts” report (Metric Benchmarking)

2003: WSAA developed “Aquamark” process BM framework

Developing Maturity:

2006: National Water Commission took over and expanded the scope of metric BM within the Australian water industry.



Key Challenges in developing Benchmarking in Aus.:

Issue	Description	“Resolution”
Interpretation of each measure by the business	<p>Early attempts at benchmarking hampered by poorly defined inputs. For example:</p> <ul style="list-style-type: none">• Is a “connection” a) the physical service; or b) the number of lots attached to that service?• Does the “mains” include services?• When does “maintenance” works become a “capital expense”	<p>WSAA Pioneered the development of a definition handbook. This document has “evolved” into a common understanding within the Aust industry; Introduction of a program of rolling audits (including audit procedure manual) to ensure that interpretations of measures were consistent</p>
Data reliability and accuracy:	<p>Data may be available but may be of different levels of accuracy (e.g. response data may be sourced directly from the field and accurate to within minutes OR it may come from daily work sheets which are accurate to within +/- 0.5 hour.)</p>	<p>WSAA/NWC developed reliability/accuracy bands (and minimum standards for publication) which identify how robust the data inputs are</p>
Interpretation of outcomes:	<p>One of the challenges is to ensure that comparison of metric outcomes is fair and realistic. For example:</p> <ul style="list-style-type: none">• Larger businesses typically have more resources (and scale economies) than smaller ones.• Some water businesses have “young” assets and hence their breaks/100km main are lower than those with “older” assets.	<p>NWC established peer groupings (small, medium, large) to assist with “like vs. like” comparison NPI report often seeks to explain anomalies or significant differences</p>



Metric vs. Process Benchmarking

- **Metric Benchmarking** (NWC/NPI):
 - Provides quantitative measure of OUTPUTS
 - Suitable for those activities that are easily measureable (e.g. Operations costs; maintenance, asset failure).
 - Less relevant for qualitative processes (e.g. environmental policy objectives, Long term business strategy, efficacy of planning)
 - Metric outcomes can sometimes be misleading:
 - E.g. low cost outcomes can be due to a) good management, b) local conditions
- **Process Benchmarking** (Aquamark):
 - Focusses on HOW an outcome has been achieved.
 - Examines the maturity and consistency of processes within a business
 - Suitable for activities for which no clear quantitative outcome is available OR those for which quantitative data doesn't reflect local conditions

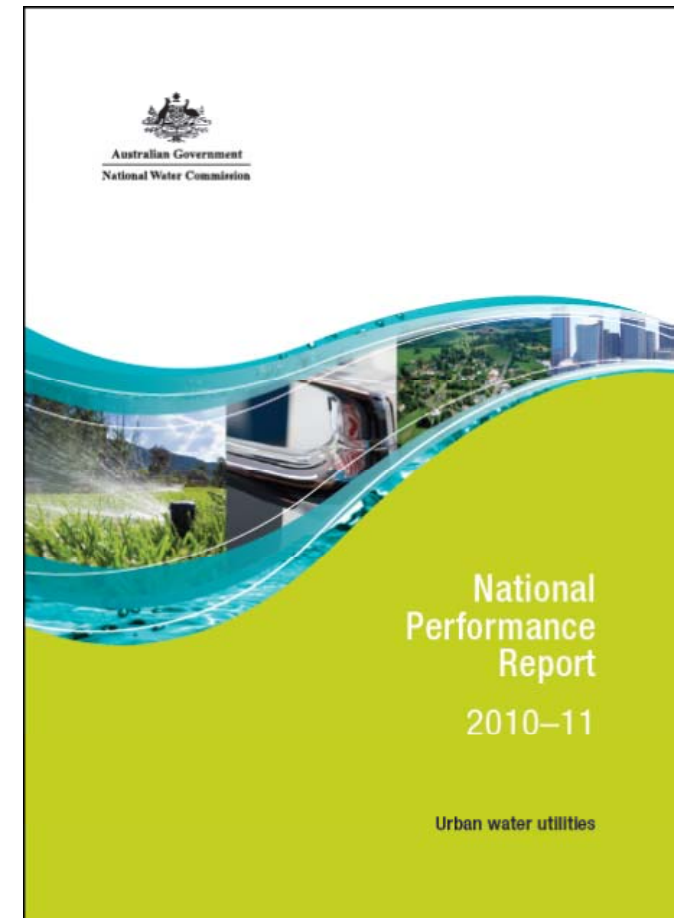


Case Study 1 – National Water Commissions Performance Measures (Metric Benchmarking)



NWC Metric Benchmarking (NPI):

- Scope:
 - Annual reporting is mandatory for all Urban Water businesses of > 10,000 connections (95% of Aust Water Industry)
 - This is supported by a rolling program of independent audits (undertaken every three (3) years)





Key Themes/Scope of NPI indicators

Water Resources:

- Sources of Water
- Uses of Water Supplied
- Sewerage Collected
- Uses of Recycled Water
- % Recycled Effluent

Assets

- Length of water mains and No of connections per km
- Sewerage Assets
- Watermain Breaks per 100km
- Water Loss
- Sewer main breaks/chokes per 100km

Customers:

- Connected Properties and Population
- Water Quality Complaints
- Water Service Complaints
- Sewerage Service Complaints
- Billing and Account Complaints
- Total Water and Sewerage Complaints
- Average Connection time to a telephone operator
- Average Duration of unplanned interruption – water
- Sewerage Service interruptions
- Customer interruption frequency – water
- Restrictions/legal action for non payment of bill

Environment:

- Comparative sewerage treatment levels
- Sewage treatment plant compliance
- No. of Sewerage Treatment plants compliant at all times
- Public disclosure of STP performance
- Compliance with the environmental regulator – sewerage
- Biosolid Reuse
- Net Greenhouse Gas emissions
- Sewer Overflows

Pricing and Finance:

- Residential tariff structure
- Revenue
- Asset Values
- Costs
- Capital expenditure
- Economic Real Rate of return
- Dividends
- Net debt to equity
- Interest cover
- Net profit after tax
- Community service obligations
- Capital works grants – water and sewerage

Public Health:

- Water Quality Compliance.



NWC Metric Benchmarking (NPI):

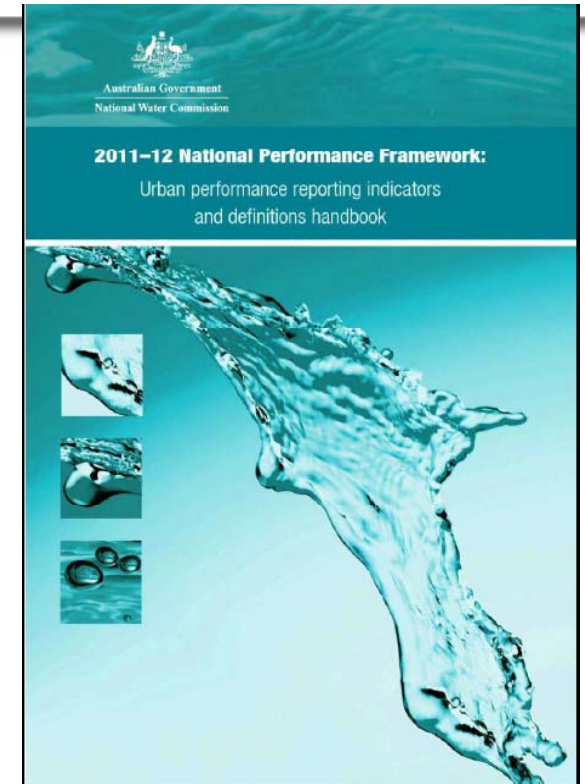
- The Process:
 - Initial benchmarking:
 - Undertaken by the agencies in accordance with the NWC Definition Handbook;
 - Data inputs placed into NPI Spreadsheet
 - Data inputs ranked in terms of:

- Reliability Bands

Reliability Band		Definition
A	Highly reliable	Data is based on sound records with adequate procedures
B	Reliable	Mostly conforms to Category “A” but there may be some deviations in the process which have a minor impact on the integrity of the data
C	Unreliable	Data has significant procedural deviations or extrapolation
D	Highly unreliable	Unsatisfactory data

- Accuracy Bands

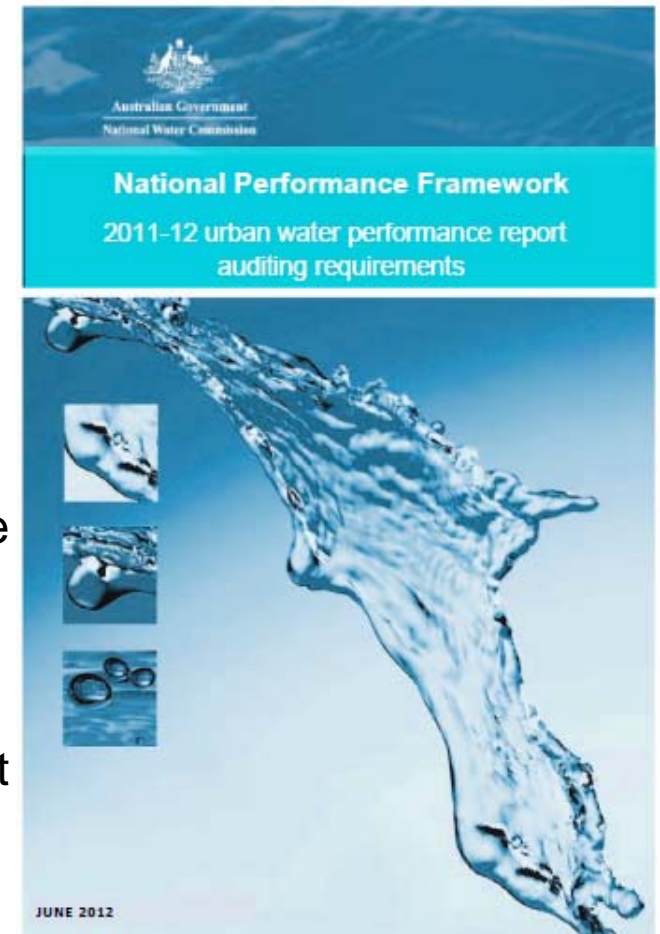
Band Level	Est. Accuracy of measuring equipment & record sampling
1	+/- 5%
2	+/- 10%
3	+/- 20%
4	+/- 50%
5	Greater than +/- 50%





NWC Metric Benchmarking (NPI):

- The Process (cont.):
 - Audits:
 - Each agency is subject to an independent external audit every three years
 - Scope of the audit includes review of:
 - **Process Compliance**: Review of procedures for data collection and management;
 - **Outcome Compliance**: to confirm that the information has been developed in accordance with documented procedures (includes an audit//review of relevant records)
 - **Integrity**: Assessment of each indicator for reliability and accuracy; and a review/comment on the adequacy of procedures and recommendations for improvement (as appropriate)
 - Audit outcomes provided in a predefined format which clearly indicates level of compliance





NWC Metric Benchmarking (NPI):

- The Process (cont.):
 - Publication:
 - Metrics that don't meet a minimum standard are not published.
 - Not all metrics are published in the Performance Report
 - Metrics are provided to State governments (and may or may not be published)
 - National Performance Report is available publicly (via web site)
 - Outcomes presented by:
 - Theme:
 - Organisation Size
 - Publication includes detailed commentary on industry trends



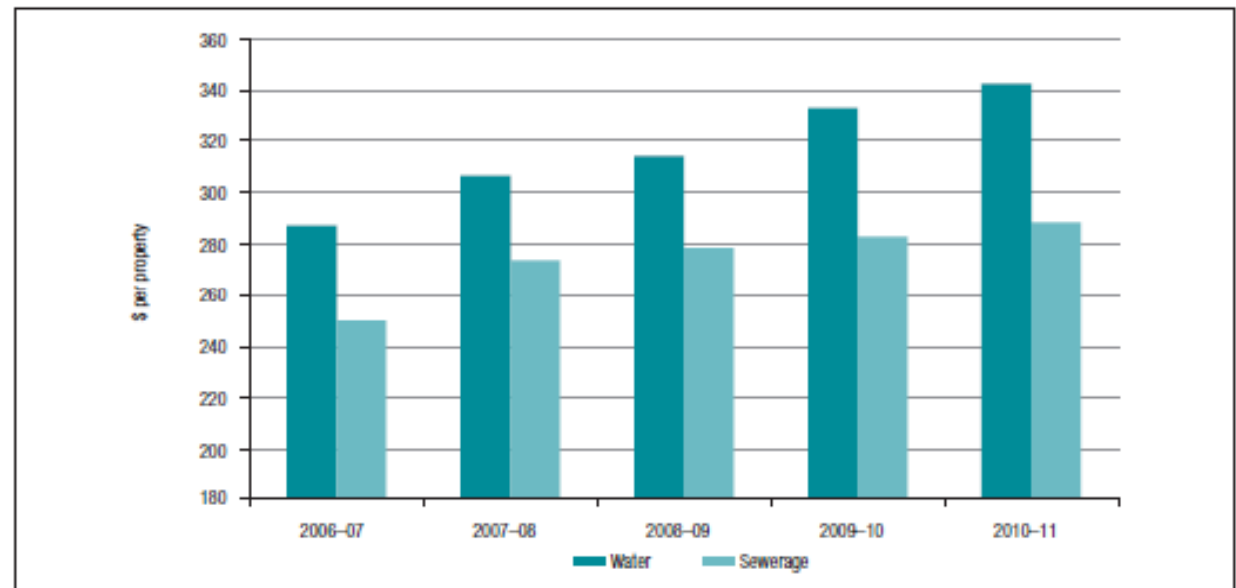
NWC Metric Benchmarking (NPI):

- Sample Themes:
 - Cap X time series
 - Op X time series

Figure ES4: F14, F15, F16 Total water and sewerage capital expenditure, 2006–07 to 2010–11 (\$m)



Figure ES5: F11, F12 Water and sewerage operating expenditure, 2006–07 to 2010–11 (\$/property)





NWC Metric Benchmarking (NPI):

- Sample Indicators:
 - Sewer Main Breaks and Chokes:
 - Presented in a summary format (by business size)
 - Individual agencies can easily compare their performance with their peers.

Table 7.2.1: Overview of results—A14 Sewer main breaks and ohokes (per 100 km of sewer main)

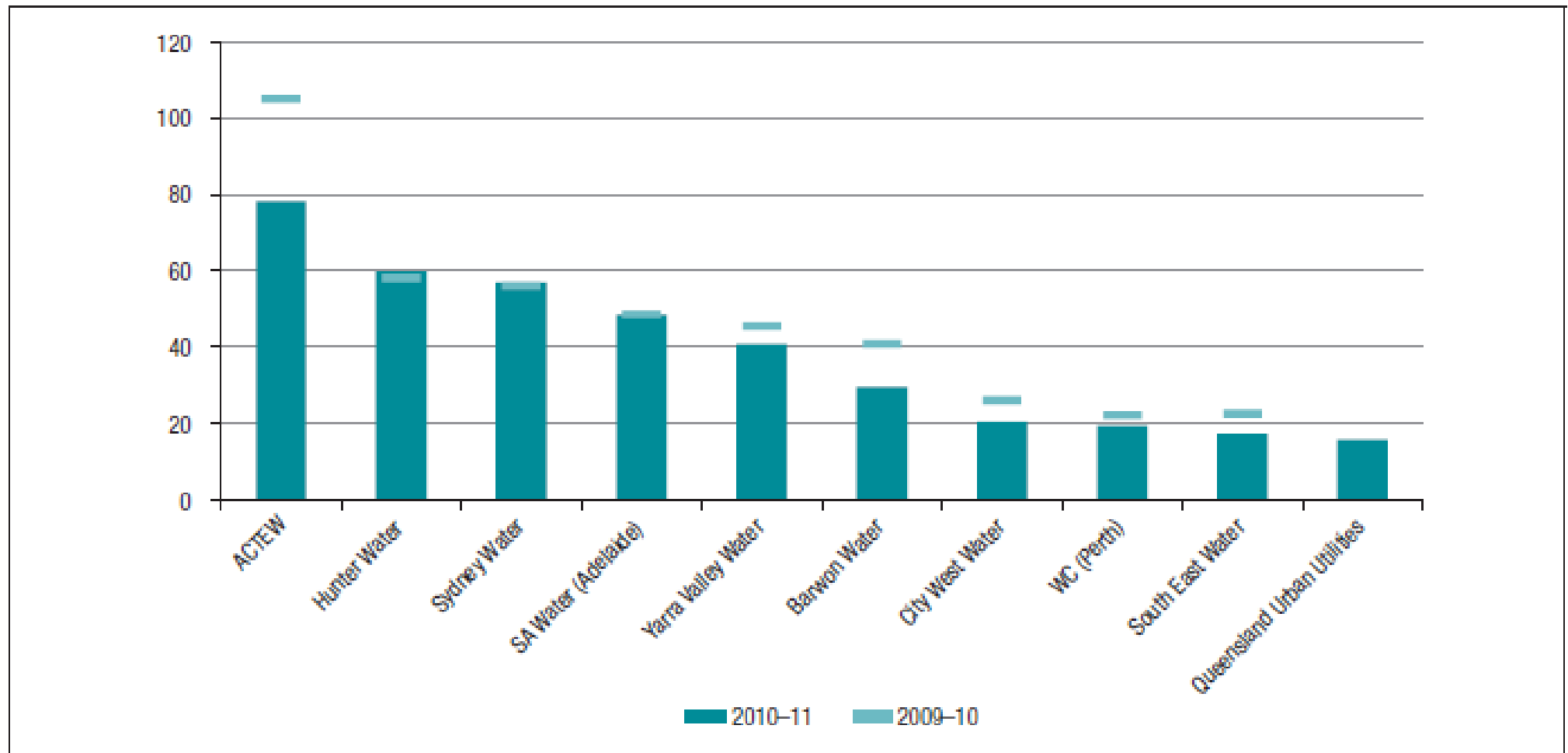
Size group	Range		Number of utilities with increase / decrease from 2009–10		Median		% change in the median from 2009–10
	High	Low	Increase	Decrease	2009–10	2010–11	
100 000+ connected properties	78	16	2	7	45	35	–23%
	ACTEW	Queensland Urban Utilities					
50 000 to 100 000 connected properties	57	3	3	6	25	22	–12%
	Wyong	Townsville Water					
20 000 to 50 000 connected properties	94	3	7	9	18	17	–7%
	Fitzroy River Water	Mackay Water					
10 000 to 20 000 connected properties	129	2	4	12	27	26	–3%
	Essential Energy	Kempsey					
All size groups	129	2	16	34	26	23	–14%
	Essential Energy	Kempsey					

Large Agencies



NWC Metric Benchmarking (NPI):

Figure 7.2.1: A14 Sewer main breaks and ohokes, 2009–10 and 2010–11 (per 100 km of sewer main)
For utilities with 100 000+ connected properties





NWC Metric Benchmarking (NPI):

- Sample Indicators:
 - Sewer Main Breaks and Chokes:
 - Presented in a summary format (by business size)
 - Individual agencies can easily compare their performance with their peers.

Table 7.2.1: Overview of results—A14 Sewer main breaks and ohokes (per 100 km of sewer main)

Size group	Range		Number of utilities with increase / decrease from 2009–10		Median		% change in the median from 2009–10
	High	Low	Increase	Decrease	2009–10	2010–11	
100 000+ connected properties	78	16	2	7	45	35	–23%
	ACTEW	Queensland Urban Utilities					
50 000 to 100 000 connected properties	57	3	3	6	25	22	–12%
	Wyong	Townsville Water					
20 000 to 50 000 connected properties	94	3	7	9	18	17	–7%
	Fitzroy River Water	Mackay Water					
10 000 to 20 000 connected properties	129	2	4	12	27	26	–3%
	Essential Energy	Kempsey					
All size groups	129	2	16	34	26	23	–14%
	Essential Energy	Kempsey					

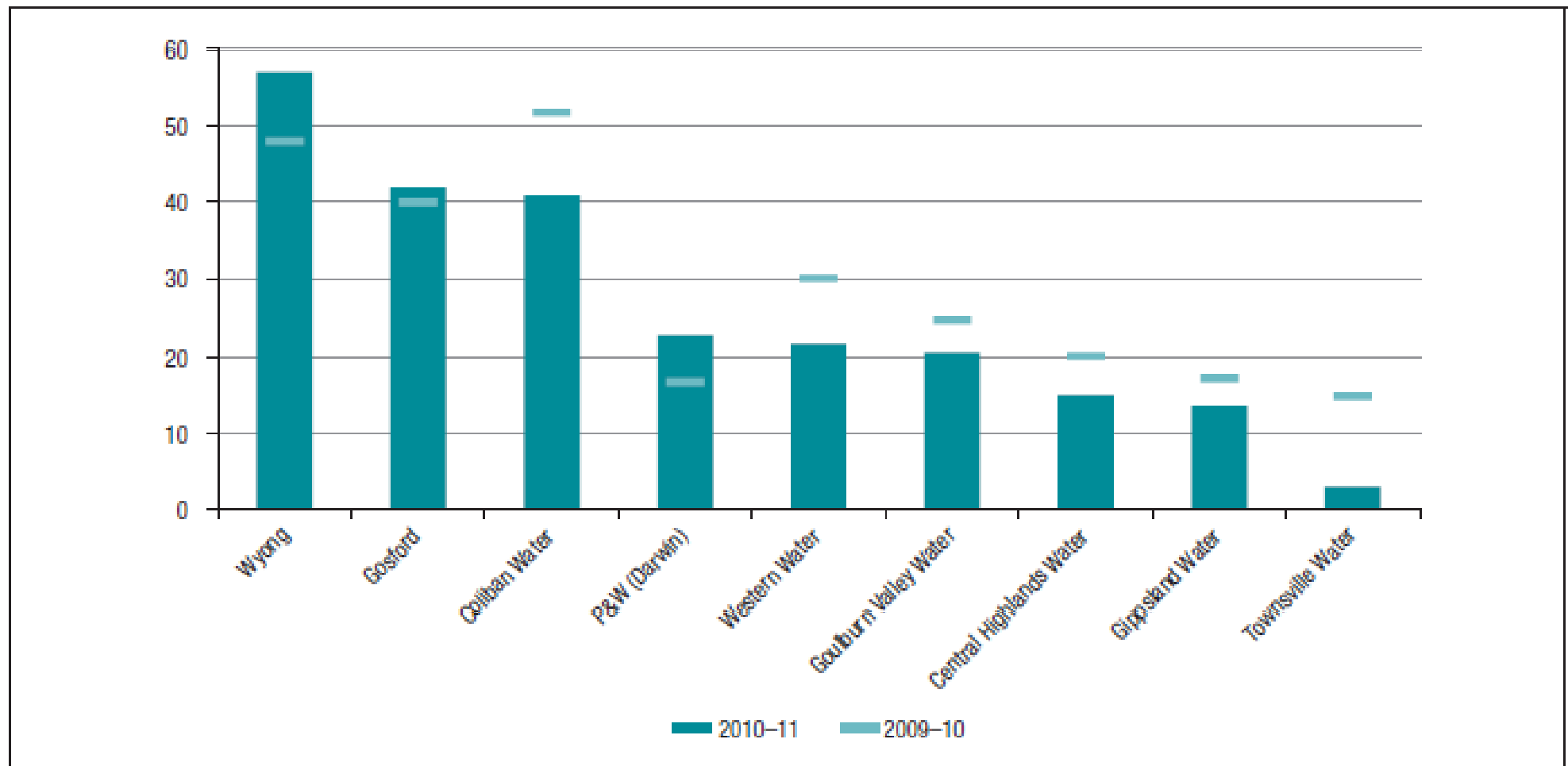
Med. Agencies



NWC Metric Benchmarking (NPI):

Figure 7.2.3: A14 Sewer main breaks and chokes, 2009–10 and 2010–11 (per 100 km of sewer main)

For utilities with between 50 000 and 100 000 connected properties





Practical Implications of NPI

- **Risk Management:**

- Greater degree of confidence in the level of sustainability of water industry assets (including identifying businesses which may be “at risk”)
- Provides tangible metrics to support other initiatives (specifically state and federal “Asset Management” policies)



- **Changes in Operational Efficiency**

- Encourages “competition by comparison” between businesses
- Greater engagement between agencies (development of stronger networks)
- However, the economic efficiency of the industry still lags
 - Productivity report of 2010 identified the economic rate of return was still well below appropriate levels



Practical Implications of NPI:

- **Capacity Development and Knowledge Management:**
 - Better understanding of the industries capabilities and performance (historically, presently and forecast)
 - Clear identification of key trends (e.g. increasing operations costs)
- **Misinterpretation is still an issue:**
 - Incorrect comparison between agencies remains a challenge
 - NWC goes to some lengths in its report to explain key differences
- **Streamlining of Reporting:**
 - State and Commonwealth governments previously asked for a plethora of performance metrics.
 - NWC/NPI now represents an agreed set of outcomes designed to address ALL needs.
 - This has lessened some of the regulatory reporting burden on the industry



Case Study 2 – Water Services Association of Australia, “Aquamark” (Process Benchmarking)



What is Process Benchmarking?

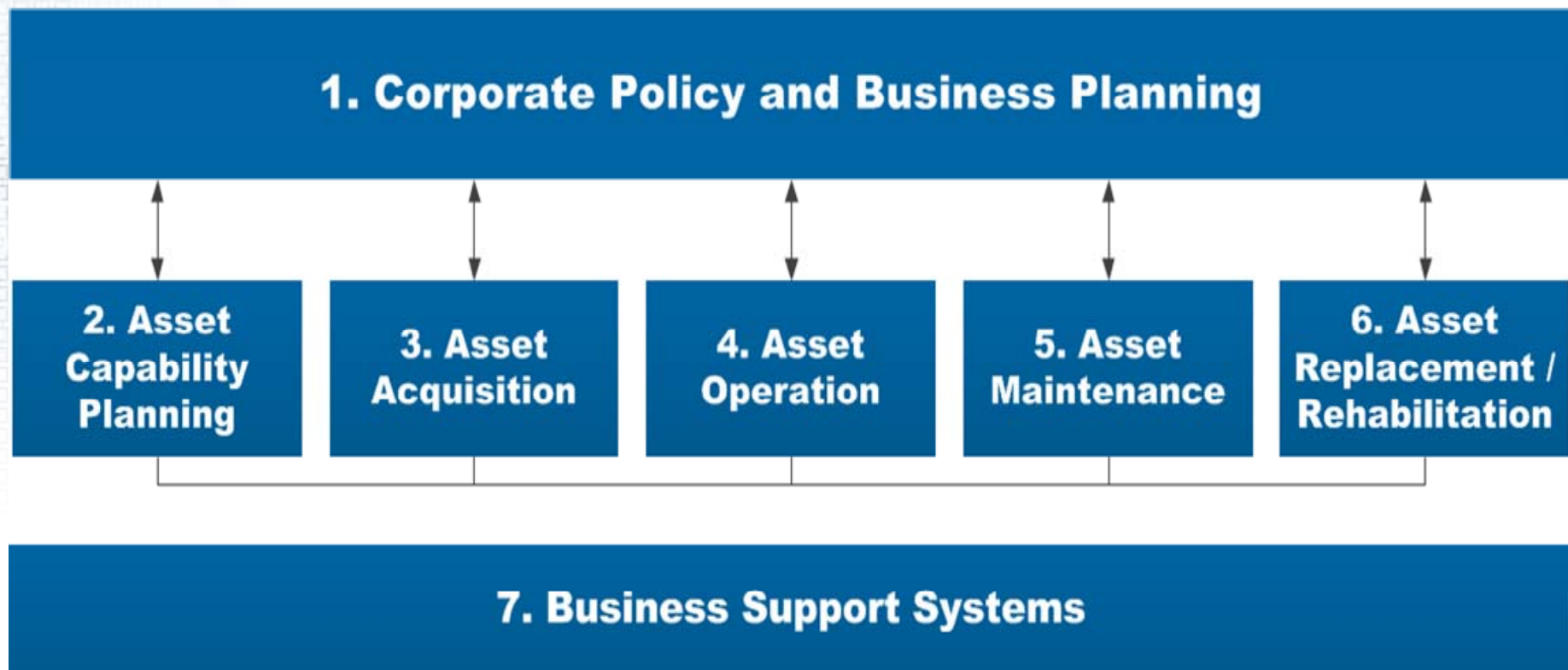
- Overview:
 - Metric Benchmarking (such as NPI) measures OUTCOMES
 - Process benchmarking assesses HOW those outcomes were achieved
- Drivers
 - WSAA realised that, by focussing on quantitative outcomes, metric benchmarking can disguise process deficiencies/excellence





An Overview of Aquamark

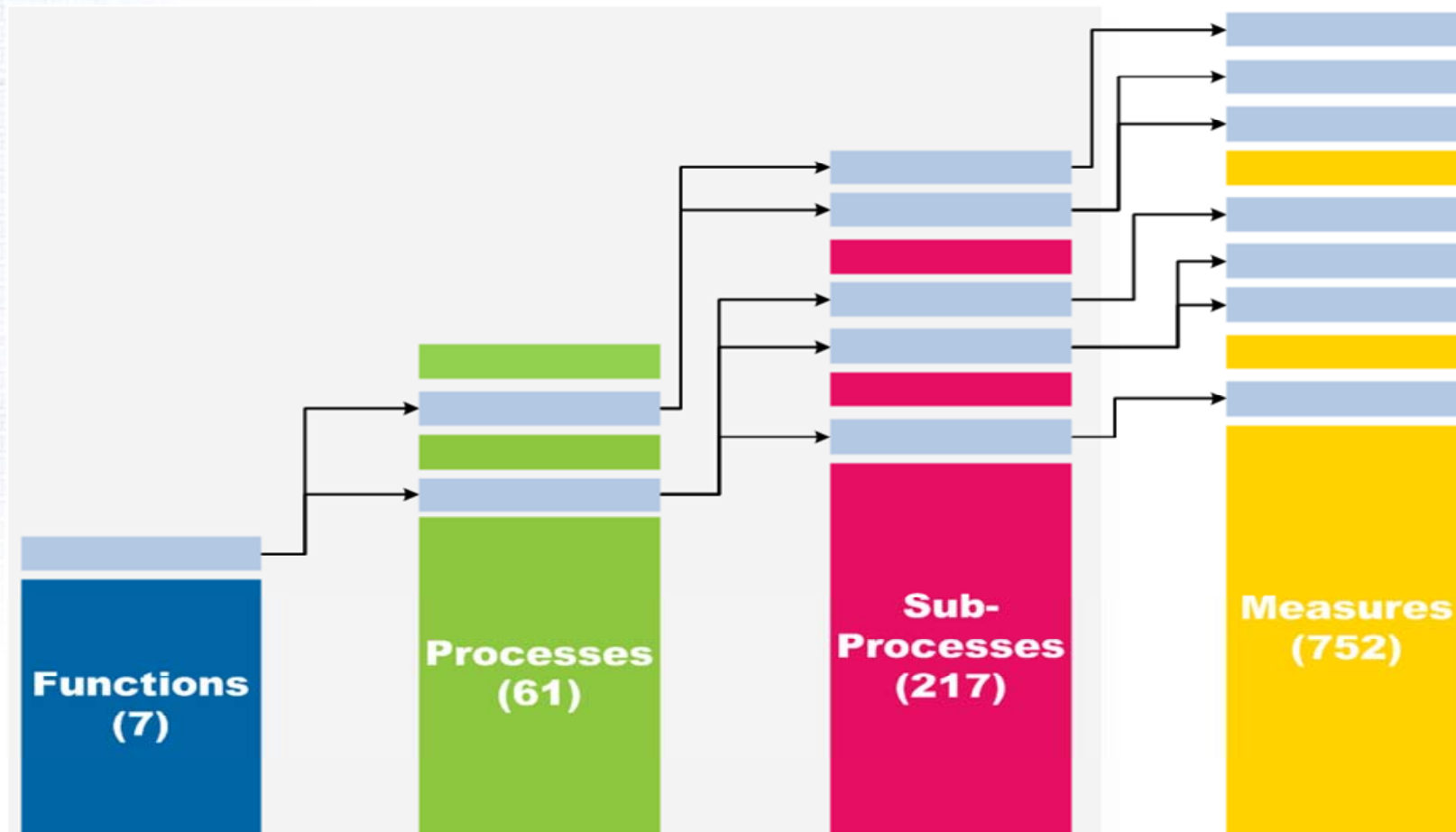
- The Aquamark software is designed to examine “whole of business” process capability and execution
- The framework mirrors standard “Asset Lifecycle” concepts





An Overview of Aquamark

- Functions are divided into a series of processes which are, in turn, developed from sub processes





Aquamark Scoring System

Process
Development

Process
Documentation

Process Coverage
& Frequency

Process
Effectiveness
(Maturity)

Capability

Execution

Score

Aquamark Scoring System

CAPABILITY		↓	↓	↓	↓	↓
		Informal	Aware	Formulated	Advanced	Robust
Step 1 Process Development (40%)	Process Objective / Outcomes	Not defined and the need is not clearly recognised	Has been defined and the need is understood	Has been defined and the need is understood	Has been defined and the need is understood in detail	Has been defined and the need is understood in detail
	Process Development	None	Initiated	Significantly developed	Substantially complete	Complete
	Process Robustness			The process includes some aspects of the measure definition	The process incorporates most aspects of the measure definition	The process incorporates all aspects of the measure definition
Step 2 Process Documentation (10%)	Documentation Development	None	Minimal	Moderate	Advanced	Complete
	Documentation Testing and Verification	Unknown	Some brief notes are available	Structured but not comprehensive	Substantially complete	Complete
			Uncertainty of its accuracy, completeness or usefulness	Limited checking and not yet checked by the persons (s) responsible / accountable	Checked, but may not yet have been checked by the persons (s) responsible / accountable	Checked by the person (s) responsible / accountable
EXECUTION						
Step 3 Process Coverage & Frequency (30%)		Sparse	Limited	Moderate	Predominant	Total
	Geographic Areas	In use in very few relevant areas (<25%)	In use in few relevant areas (25 to 50%)	In use in many relevant areas (50 to 75%)	In use in most relevant areas (>75%)	Can demonstrate its use in <u>all</u> relevant areas
	Asset Classes / Categories	In use in very few relevant asset classes (<25%)	In use in few relevant asset classes (25% to 50%)	In use in many relevant asset classes (50 to 75%)	In use in most relevant asset classes (>75%)	Can demonstrate its use in <u>all</u> relevant asset classes
	Services Provided	In use in very few services (<25%)	In use in few services (25% to 50%)	In use in many services (50% to 75%)	In use in most services (>75%)	Can demonstrate its use in <u>all</u> services
	Frequency of Use	Use is uncommon and known to a few personnel	Used intermittently with no systematic management and there are significant gaps in staff use	Used often and the developed process is generally adhered to by many relevant staff	Used consistently with few deviations from the developed process by most relevant staff	Can demonstrate that the process is used (>90% of the time) by the majority of relevant staff (>90%)
Step 4 Process Effectiveness (20%)		Rarely	Occasionally	Often	Usually	Always
	Achieve Desired Outcomes	Step 1 defined outcomes not achieved	Step 1 defined outcomes achieved in few relevant areas (25% to 50%)	Step 1 defined outcomes achieved in many relevant areas (50% to 75%)	Step 1 defined outcomes achieved in most relevant areas (>75%)	Can show Step 1 defined outcomes are achieved in <u>all</u> relevant areas

Notes:

Score Selection: To achieve a score (eg Advanced) a utility must meet each of the minimum requirements specified in the rows below the score title (eg Advanced).

Constraints: The Step 1 score limits the possible scores for Steps 2, 3 & 4 as shown by the coloured bars (eg. Step 1 Aware restricts Step 2 to None or Minimal – shown by yellow).

Measure Definition: Consists of the Measure Description and Intent, as defined within the Aquamark Tool.

Asset Class: Judgement is required to proportion percentages / define asset classes for each utility. Consider asset value, ownership cost, relative risk and total number of classes.

Services Provided: Services provided by the utility (eg. Potable water supply, wastewater collection, treatment and disposal, recycled water supply, etc)



Practical Implications of Aquamark:

- For industry:
 - Clearly defined broader issues and major trends
 - Regulatory constraints;
 - Sustainability (Climate change and Demand)
 - Skills shortages
 - Asset growth, renewal and access to capital for investment;
 - Identified weaknesses and led to industry wide improvement initiatives
 - Identified “best practice” (learning opportunity)
- For businesses
 - Identified if strengths were aligned with the businesses need:
 - E.g. Planning in high growth areas; renewal in businesses with older assets
 - Identified these who were “best practice” in these areas



Closing comments:



Closing Comments

- **Overall:**

- Benchmarking has been a key tool in assisting the Australian Water industry develop over the past 15 years
- The process has been long and arduous and we still have a long way to go.

- **Key decisions:**

- WSAA's decision to benchmark its own members;
- The identification of the need to develop an agreed definitions of terms and indicators
- Introduction of independent audits to improve the veracity of outcomes
- Development of process benchmarking to compliment metric benchmarking.



Closing Comments

- **Benefits of Benchmarking in the Australian context:**
 - Identified strengths/weaknesses in the industry (triggering industry wide improvement initiatives)
 - Provided a tool to compare one businesses performance with another
 - Encouraged sharing of knowledge between businesses
 - Fostered competition by comparison.
 - Provides a tool for identification of current trends and potential issues (an “early warning” system).
 - Helped secure funding for development of water services infrastructure over the past 15 years.

Questions

