but after the second in 2001, PPWSA found that its revenue already covered supply costs because of a higher collection ratio, the drop in illegal connections, and reduction of unaccounted-for water, according to ADB. Illegal connections are down to less than 20%.

The way forward

Throughout the Cambodian provinces, urban water utilities are starved of the experience PPWSA now represents. Discussions are underway to determine how to best proceed under what can only be described now as a political environment more complicated than the one in the early 1990s.

Many observers say the best way forward would be to temporarily bring other utilities under the PPWSA's authority, with clear plans for future autonomy, such that its culture and systems can be passed on. However, this faces resistance, not least from the big development agencies, where the agenda still favors privatisation as the best solution for the region.

Ek Sonn Chan has his own preferences: 'To my own thought, I prefer to directly 100% control those water works – one by one for a certain time, probably three to five years – then release them to be autonomous.' Doing so, he argued, would 'actualise' PPWSA experience without working in the long-term against the government's decentralisation policy. 'I am quite sure this idea is realistic.'

Aside from advisory services to the Siem Reap Water Supply Authority, which was just renovated under grant aid of Japan, the PPWSA also shared its experience in a recent first meeting that gathered water supply authorities from around the country. But he adds: 'I don't think that's going to help much.'

There are also discussions now, he says, about creating a Cambodian Water Work Association with PPWSA as its core, providing advisory services as well as contract services on specific issues, and contract management with PPWSA.

One way to proceed would be to pick one or two provinces and do an experiment – do the same thing as was done in Phnom Penh, says Mr Ye. Another would be to have provincial staff come in to Phnom Penh for training, which at least could give them the skills and dedication to take back to their provinces. Similarly, PPWSA staff could be seconded to the provinces temporarily.

The next big challenge is in sanitation. It was difficult to get people to pay for what they use, says Ek Sonn Chan. It is altogether another thing to get people to pay for their waste. ●

Are utility attitudes to the environment shaped by corporate governance? Assessing the evidence from Australian utility reports

Like much of the rest of the world, Australia is currently adapting its policies, legislation and resource management practices to achieve more environmentally-sustainable water usage. But does the extent to which water utilities implement appropriate measures depend upon their corporate governance? **ADAM GRAY** and **JENNIFER McKAY** describe ongoing research of utility reports to assess this.

Australia's Centre for Comparative Water Policies and Laws (CCWP&L) is currently undertaking research on behalf of the Cooperative Research Centre for Irrigation Futures (CRC-IF) on whether a water supply business' environmentally-sustainable development (ESD) agenda is impacted by the specific types of governance that they are formed under. In other words, is the business structure of a water utility likely to help or hinder a utility's pursuit of environmentally sustainable water management practices?

This feature looks at the current state of the Australian water industry and the governance structures or types in current use, and then illustrates the ESD priorities through analysis of the content of top management reports from nearly two thirds of the water supply businesses (WSBs) in the country.

The Australian context

The usual challenges faced in water resource management are somewhat exacerbated in Australia by three factors. Firstly, as is commonly noted, Australia is the driest populated continent in the world. Most of the country is arid or semi-arid. There simply is not a lot of water available.

Secondly, Australia's economy is currently – and has traditionally been – heavily geared towards primary industry. A significant percentage of Australia's annual export is in water-consuming agricultural products such as beef, wool, wheat, and so on.

Thirdly, when Australia federated in 1901, Section 100 of the constitution vested all water resource management powers within the individual states and territories. This has led to each state and territory pursuing its own parochial agenda in terms of water legislation and policies. This in turn has resulted in a highly-fragmented water industry.

In the early 1990s, with much of the country enduring severe drought conditions, the federal government used the Council of Australian Governments (CoAG – a framework for regular meetings between the federal government and each state and territorial government to examine and coordinate on issues of national significance) to begin fostering a national approach to water resource management. Ultimately this led to the adoption of the National Water Initiative (NWI) in 2004 (McKay, 2005; for more information see www.pmc.gov.au/nwi/index.cfm.

In August 2003, Australia's deputy prime minister stated in the introduction to the NWI that 'Australians use 250,000 litres per year, which is about 30% higher than the OECD average' (Anderson MP 29 August 2004). He went on to say that when it is finished: '…the NWI will affect every single Australian household… Our lives depend on a staggering amount of water, so it is crucially important to each Australian who eats steak that costs 50,000 litres per kilo or drinks fruit juice that costs 780 litres per litre of juice.'

As mentioned above, many of the issues faced by Australia's water industry today are a legacy of federation and Section 100 of the Australian constitution. Section 100 states that 'the Commonwealth shall not, by any law or regulation of trade or commerce, abridge the right of a state or of the residents therein to the reasonable use of the waters of rivers for conservation or irrigation.'

Section 100 was inserted because New South Wales, Victoria and South Australia feared that Commonwealth laws under another section, 51, might affect their common interest in water for irrigation. (Crawford 1991). Section 100 arose out of the two-fold importance of rivers for navigation and reservoirs for irrigation storage. The object of this section was to limit the supremacy of navigation insofar as this would limit the reasonable use of water by the states.

However, by enshrining state autonomy in water resource management, the clause has brought about little national coordination or standardisation within the industry. This has led to very different policies and practices across the country.

The states' parochialism and autonomy in water legislation lasted until 1994, when the CoAG created national-level policies and funded the states to implement them by incentive payments defined under section 96 of the federal constitution. In addition, the national government has increased it powers to directly intervene, with new powers under the Environmental Protection and Biodiversity Conservation Protection Act 1999 (CTH) which gives the Commonwealth power over environmental matters of national significance.

The Commonwealth also increased the power to regulate Corporations Law companies and state-owned enterprises under the Corporation power enshrined in section 52. (Moeller and McKay, 2000). Finally, the Act's external affairs powers can be used to implement treaties with environmental outcomes.

The CoAG reforms required institutional separation of the old public sector providers into water service providers, pricing regulators and environmental managers. The reforms also required full cost recovery from all water sectors – that is, both rural and urban – with separation of water property rights from land titles, and a comprehensive system of entitlements reflecting volume, security and quality.

One overriding obligation of the reforms was to achieve sustainable management processes. Some commentators observed that the CoAG water resources policy imposed two competing objectives: resource security for end users and public interest goals of environmental management.

The CoAG reforms were funded by financial incentives to the states of Aus$16 billion ($12 billion) (McKay, 2002). The CoAG requirements outlined in the policy statements were predicated on the view that separate bodies would promote more transparency, reduce conflicts of interest and promote accountability. However, some commentators have speculated that the separation has increased institutional barriers, reduced communication and increased costs (Productivity Commission, 2003). The micro-economic reform agenda commits all governments to:

- universal application of pro-competition laws
- the creation of independent regulators to regulate the pricing of services from state monopolies
- structural reform of government to facilitate competition and the review of any legislation that restricts competition.

Evaluating Australia's fragmented industry

When the CoAG reforms were adopted, the water sector in Australia was highly fragmented with over 800 suppliers (Broughton 1999). It is still regarded as highly-fragmented (Productivity Commission 2003) and diverse, with in excess of 300 businesses.

Research carried out by the Centre for Comparative Water Polices and Laws has identified approximately 333 authorities or agencies that sell and distribute water as of December 2005. (see Table 1)

When evaluating a WSBs governance type, the objective is to identify what its legal structure is. For example, while a single individual might own a corner store, it might also be owned by a family trust, a corporation, or any one of a number of possible scenarios. A similar variation in governance structure can be found within Australian water supply businesses.

Once types have been confirmed, patterns can be identified and trends that are associated with being formed under a specific governance type can be illustrated. The first task has been to identify the WSBs in each state and territory. This has meant identifying and merging lists obtained from various sources, including the local governments of each state, numerous state and federal departments, irrigators' councils and authorities, various water associations, and several dozen state-owned and private bulk water supply service providers.
The next stage was to identify which Governance Typologies existed within Australia. This involved an examination of Annual Reports, State and Federal Legislation, and a review of available benchmarking literature from Australia, Europe, and the United Nations. Through this process, 20 corporate governance types were identified within the Australian water industry (see box).

Each of these types is formed under a different legislative framework. They have different requirements in a number of areas, including public reporting, obligations to shareholders, owners and stake holders, and so on. This process illustrated another key factor in the shaping of ESD priority, and that is whether the WSB has multiple missions or is largely a single-mission business.

Three main categories of mission breadth have been determined.
They are:

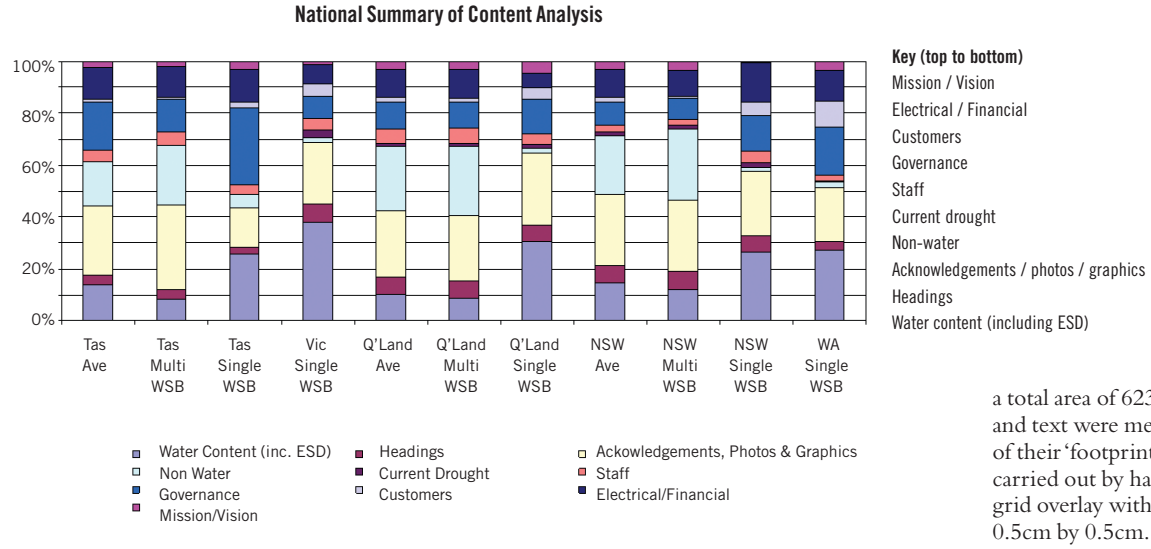
- Multi mission: indicates that the WSB has multiple areas of activity, such as water and roads and rubbish removal, etc. Generally these WSBs are local government authorities of one kind or another.

Corporate governance types identified within the Australian water industry

- local government authorities
- shire councils
- town councils
- city councils
- island councils
- aboriginal councils
- joint local government organisations
- local government-owned corporations
- water boards
- rural water boards,
- rural drainage boards
- government departments
- government-owned corporations
- statutory bodies
- private entities
- Corporations Law companies
- revised corporations
- irrigation trusts
- customer councils
- self-managed trusts

Table 1 - Australian water supply businesses and governance types.

State	Population	Area	WSBs	Governance types	Mission breadth
Australian Capital Territory	314,171	2,358	1	1	Dual mission
New South Wales	6,532,459	800,628	145	16	Multiple mission
Northern Territory	197,590	1,335,742	1	1	Dual mission
Queensland	3,627,816	1,723,936	133	16	Multiple mission
South Australia	1,502,397	978,810	7	5	Single mission
Tasmania	470,272	64,519	14	5	Multiple & Single
Victoria	4,828,968	227,010	24	4	Single mission
Western Australia	1,909,751	2,526,786	8	6	Single mission
Australia	19,383,424	7,659,861	333	20	



- Dual mission: indicates that the WSB has two areas of activity. In most instances within the Australian water sector, this mission breadth occurs within utilities that provide water and power services.
- Single mission: indicates that the WSB has just one area of activity.

For example, a local government in Queensland has a number of responsibilities and objectives ranging from the old cliche of 'roads, rates, and rubbish' to provision of childcare, supplementary health services, and so on. By contrast, a rural water authority in Victoria has really only one business – water.

Assessing the content of management reports

The next stage of the research was to submit the top management reports of identified WSBs to content analysis to identify agenda priorities. Content analysis is a well known technique and has been applied to the annual reports of arts organisations in Australia (Rentshcler and Guersen, 1999). Content analysis is a way of determining management emphasis, priorities, or changes in corporate objectives.

The underlying assumption is that senior management will express what they perceive to be positive, compelling and laudable in the reports that are written for their businesses' stakeholders and shareholders. As such, it is possible to determine what their priorities are in their management of their company. Content analysis is carried out manually by measuring (in centimetres) the amount of space dedicated to specified subjects. After using content analysis, the researchers are able to present an assessment of the document in terms of the percentage of document pertaining to a specified topic. For example: '1.3% of this document concerned non-water related infrastructure maintenance'.

A total of 62 distinct subjects were defined, with these falling into 10 main categories. These categories are used within the research to provide 'generalised' snapshots of a WSBs attitudes and focus. The 10 categories used are:

- water content (including ESD)
- headings
- acknowledgements and photos of CEO
- non-water
- current drought
- ESD
- staff
- governance
- customers
- elections/profits
- mission/vision

To carry out content analysis on the selected WSBs, annual reports were obtained and the introductions, highlights, mayoral report, CEO's report and managing director's reports from within the annual reports were examined. The TMRs were printed on A4 paper which measures 21.0cm by 29.7cm. This means that each page has a total area of 623.7cm^2. All graphics and text were measured to find the area of their 'footprint'. Measurement was carried out by hand with a transparent grid overlay with each square being 0.5cm by 0.5cm.

A tally of the total space for each of the 62 subjects was then kept as the document was assessed. After the assessment was completed, the total for each category was determined. The data was entered into an Excel spreadsheet and percentages of TMR were calculated.

Results

As the research is still in progress, it would be too soon to draw conclusions at this time. Nevertheless, the preliminary results are intriguing (see graphic).

As one would expect, it does appear that WSBs with a single mission or dual missions are more likely to address ESD and water than multi-mission WSBs. There may also be a correlation between the level of fragmentation of the water industry within a given state and the likelihood of ESD attention and adherence to the NWI.

The research is progressing well. It is anticipated that with the data gathered the CCWP&L will be able to examine whether issues of business size, customer base, customer type (rural, urban, irrigator, residential, and so on), staffing levels, region, type of ownership and even water source have any impact on a WSB's tendency to adhere to ESD and the NWI. ●

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What gets measured gets done: applying a seven-step methodology in Columbus, Georgia

The Columbus Water Works is using a new seven-step performance measurement methodology to set and achieve strategic goals. **TERRANCE BRUECK** and **BILLIE G TURNER** look at the approach and how it has been applied.

'It is not enough to do your best; you must know what to do and then do your best.'
W Edwards Deming

What gets measured gets done, especially when we know what to do. When human beings are involved, measuring performance is a proven method of improving outcomes. Most forward-thinking utility managers recognise the value of implementing a sound performance measurement programme. The difficult part is determining what exactly to measure.

To provide some answers, a joint Water Environment Research Foundation/AWWA Research Foundation (WERF/AwwaRF) research project, 'Developing and implementing a performance measurement system', was conducted and published in 2005. Utilities across North America participated in the research, sharing their own experiences with performance measurement systems, and developing new frameworks that would serve as the standard for water and wastewater utilities. Primary participants included the City of Phoenix Water Services (Arizona), Union Sanitary District (California), Seattle Public Utilities (Washington) and Central Contra Costa Sanitary District (California).

Fig 1 The strategic framework

The purpose of this research was to provide methods and tools that would enable a water or wastewater utility to develop and implement a proven performance measurement system approach. The project included core research, demonstration pilots, and application of the pilot results and lessons learned to the final published process.

The end result is a seven-step methodology, based on a Balanced Scorecard (BSC) approach, to design and implement performance measures at both the enterprise (utility-wide) level and the team level. The means to align and coordinate measures throughout the organisation were defined for both levels, and recommendations were made for involvement, education, communication and commitment of utility participants for successful performance measurement.

This feature explores how utilities can develop an effective performance measurement system. It also examines the case of a mid-sized US utility that has implemented performance measurement as an integral part of its strategic planning. These lessons learned, in both research and practical use, can be applied anywhere in the world where utilities desire to improve performance.

Columbus Water Works

Columbus Water Works (CWW), 170km south west of Atlanta, Georgia,