WSAA Report Card 2009-2010

WATER SERVICES ASSOCIATION OF AUSTRALIA

Performance of the Australian Urban Water Industry and projections for the future

Overview of WSAA

The Water Services Association (WSAA) is the peak body of the Australian urban water industry.

The Association's 29 members and 25 associate members provide water and sewerage services to approximately 16 million Australians, New Zealanders and to many industrial and commercial enterprises.

WSAA was formed in 1995 to provide a forum for debate on issues important to the urban water industry and to be a focal point for communicating the industry's views.

WSAA encourages the exchange of information and cooperation between its members so that the industry has a culture of continuous improvement and is always receptive to new ideas.

The functions of WSAA are to:

- be the voice of the urban water industry at the national and international level and represent the industry in the development of national water policy,
- facilitate the exchange of information and communication within the industry,
- undertake research of national importance to the Australian urban water industry and coordinate
- coordinate key national research for the industry,
- develop benchmarking and improvement activities to facilitate the development and improved productivity of the industry,
- develop national codes of practice for water and sewerage systems,
- assess new products relating to water, sewerage and trade waste systems on behalf of the water industry,
- jointly oversee the Smart Approved Watermark Scheme for products and services involved in conserving water use
- coordinate annual metric benchmarking of the industry and publish the National Performance Framework with the Federal and State Governments.

Appreciation

I am grateful to the WSAA Members who have contributed to this Report Card.

Ross Young, Executive Director, WSAA

Abbreviations

GL represents gigalitres. One GL equals one billion litres
ML represents megalitres. One ML equals one million litres
kL represents kilolitres. One kL equals one thousand litres

Data sources

Data sources in this paper where not specifically indicated have been obtained from WSAA Members and the National Performance Report 2008-09, published jointly by the National Water Commission and WSAA.

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Summary

The 2009-2010 WSAA Report Card outlines the context for the changing face of the Australian urban water industry.

Key contexts in which the industry operates

Climate shift – yields have declined and variability is increasing

Climate variability remains the 'X factor' in water resource planning in all areas of Australia and this variability impacts on all aspects of managing the urban water cycle.

Rapidly growing populations and changing demographics

Along with climate change, population growth is the next factor that influences water consumption in cities and towns. The ABS predicts that our population could grow to 35.5 million (Series B - see Appendix 1) by 2056 and the majority of this growth will occur in urban areas.

Rising water prices

Water prices continue to rise in capital cities and major urban areas to enable the funding of significant capital works that are required to reduce the risks of climate change and build water systems that are more resilient.

Additional environmental flows for stressed rivers

The urban water industry is cognisant of its responsibilities to ensure waterways have additional flows in the future to ensure the health of our stressed rivers.

Expectations of increased levels of service i.e. growing affluence

The use of water restrictions to ration water comes at a cost and creates significant inconvenience and the water industry must deliver the security of supply demanded by customers and for which they are willing to pay.

Cities of the future - taking a fresh look at the resources available in the urban water cycle

Work is being undertaken under the Cities of the Future program which looks at how our cities can be designed better and re-plumbed to ensure that they are more water sensitive and resilient.

Moving beyond water restrictions

As the new water sources come online in Australia's large cities the intention is that water restrictions will be removed and will be replaced with water saving rules. Managing the transition from restrictions to water saving rules will be a challenge for the industry, though such changes have already occurred in Sydney.

The challenge of the water/energy nexus in a carbon constrained world

There is a very strong nexus between water and energy, both at the utility and household level. Understanding the nuances of water and energy in a sustainability context will be a key factor in reducing greenhouse gas emissions.

How our industry is changing

Cities of the Future

Given climate change and population growth it is imperative that the Australian urban water industry recognises the need to develop much stronger relationships and collaborate with all the institutions and sectors that determine the shape and style of the cities we will live in the future. Key principles established at a national workshop are considered to be pivotal to changing the way our cities are planned in the future.

Intelligent networks and smart metering

Intelligent network solutions are broadly defined as emerging technologies and systems, which have the potential for significant benefit to water service delivery, integrated water management, and customer value enhancement.

WSAA has been engaged in preparing for the advent of smart metering and its possible application in the urban water industry in Australia. Through the Metering Codes of Practice project, an industry specification for domestic smart water meters is being developed which has attracted significant international interest from meter suppliers given this is a world first.

The costs and benefits of smart metering will have to be assessed carefully to ensure that some customer segments are not unfairly disadvantaged.

Managing more complex systems

The systems we now manage are much more complex, as there are multiple sources of water in our new supply systems.

It is essential that these more complex and diverse systems are optimised from an energy and cost perspective. More importantly, they must be managed to protect drinking water quality.

Operating in a carbon constrained world

The urban water industry accepts the inevitability of a carbon constrained future.

Many of the water utilities have already committed to become carbon neutral within the next decade or so and it is these ambitious targets that are driving a very strong focus in the industry on reducing energy and maximising the use of renewable energy.

Already each of the desalination plants built or currently under construction in Australia has the greenhouse gas emissions offset either through the construction of renewable energy sources or purchasing green credits.

WSAA has been producing tools and products to assist the utilities to understand their greenhouse gas footprints and where the low hanging fruit may exist in reducing these footprints. Examples include Energy and Greenhouse Gas (GHG) tools: Cost of Carbon Abatement tool (CCA) and Greenhouse gas water industry guideline development.

Water sector skills capacity and capability

Water industry capacity and capability is still a major issue in the urban water industry and the AWA have established the Water Industry Skills Taskforce to ensure there is a high level commitment to developing the capacity and capability of the urban water sector.

Brand recognition of the Australian water industry internationally

There is growing interest in the achievements of the Australian urban water industry internationally particularly in the United States. During the year senior managers from utilities and Federal and State Governments participated in numerous forums in the United States relating to strategies implemented to adapt to climate change, water efficiency programs, asset management, energy efficiency and reducing the industry's carbon footprint, just to name a few.

The key reason that the United States water industry has had so much interest in Australia is that climate change has finally started to impact on water systems in the United States and the Americans are very keen to learn from our experiences.

Expanding capital works program

The last 12 months has seen an unprecedented increase in capital expenditure by urban utilities. The 2008-09 National Performance Report indicated that total capital expenditure increased from $4.5 billion in 2007-08 to $8.1 billion in 2008-09. This represented an 80 percent increase over a 12 month period. Projects include new sources of water, recycled water systems and upgrade of wastewater systems. To a large extent this significant expansion in capital works investment programs can be viewed as the cost of adaptation to climate change, although there are other factors involved including growth and improvements in standards of service.

Looking forward

The coming year will be significant for the urban water industry due to a number of processes underway to review the reform agenda for the industry. The Productivity Commission Inquiry and projects being undertaken by the National Water Commission all have the potential to change our industry. Particular areas that WSAA will be investigating include:

- capital investment prioritisation,
- potential for competition in urban water markets,
- scarcity pricing,
- nationally consistent third party access regimes, and
- customer service process benchmarking.

The industry has great capability with a highly skilled and experienced workforce and this will enable it to meet the challenges of the future whilst looking after customers and the environment.

Ross Young
Executive Director, WSAA

Introduction

It has been another challenging and eventful year for the Australian urban water industry. It is pleasing to report that regular rainfall returned to many urban catchments which resulted in increases in water storage levels across eastern Australia.

South East Queensland experienced the largest increase in its storages due to extensive summer rainfall, and at the time of writing, these storages were 95 percent full. However, Sydney storages remain below 60 per cent and the news is not good from Western Australia as Perth is will record one of its driest winters on record. **The lack of winter rainfall in Perth is a timely reminder that despite good rain during winter in some areas the climate can quickly turn and this reinforces the need for resilient water supply systems to reduce climate risk.**

Desalination plants were commissioned in Sydney and at Tugun in South East Queensland over the last 12 months. Desalination plants are under construction in Melbourne, Adelaide and Perth with completion dates of 2011, 2013 and 2011 respectively.

The combination of new water sources including desalination and recycled water along with more favourable rainfall has allowed water restrictions to be removed and replaced with water saving rules in Sydney and South East Queensland. Interestingly, water consumption has not increased significantly in Brisbane and Sydney following the removal of water restrictions. This is probably due to many households having 'plumbed' in water efficiency to their homes. With the development of a water saving ethos in urban Australia people are generally being careful with their water use given that the memories of acute shortages are still fresh in their minds.

The WSAA Report Card this year concentrates on the changing face of the urban water industry. It is a great period of change in our industry and there is little doubt that the integrated water systems we manage now will continue to evolve over the next decade.

In summary, the industry is moving out of an era of single sources of supply with big systems for both water and wastewater to a future that has much greater complexity involving smaller decentralised systems where emphasis is being placed on energy efficiency, environmental protection, maximising recycling opportunities and sustainability. There is also the need to adapt to a future where carbon will eventually be constrained either by price, taxation or regulation.

Of course as water is the quintessential social environmental and economic resource stakeholder and community engagement will continue to be an essential component of water resource strategies and major projects.

Desalination plants are important sources of water for our capital cities

City	Location	Capacity (ML/annum)	Ability to increase capacity (ML/annum)	Completion date
Sydney	Kurnell	90,000	180,000	Completed
Melbourne	Wonthaggi	150,000	Up to 200,000	2011
South East Q'ld	Tugan	49,000		Completed
Perth	Kwinana	45,000		Completed
	Binninyup	50,000	100,000	2011
Adelaide	Port Stanvac	100,000		Dec 2012
	Total	**484,000**	**674,000**	

This represents 35% of capital city water consumption in 2008-09

This represents 49% of capital city water consumption in 2008-09

Context for the changing face of the urban water industry

Developments in the urban water sector over the past 15 years have shaped the industry today. Understanding each element of the present is key to understanding the future.

The following are the key contexts for the industry:

Climate shift – yields have declined and variability is increasing

The impacts of yields from water supply catchments due to climate change have been well documented. These impacts include rising temperatures, changing rainfall patterns and a lack of large rainfall events.

Climate variability remains the 'X factor' in water resource planning in all areas of Australia. This variability also impacts on all aspects of the total urban water cycle including wastewater and stormwater systems.

Rapidly growing population

Along with climate change, population growth is the next factor that influences water consumption in cities and towns.

In order to inform community debate on this issue in July 2010 WSAA released Occasional Paper No. 25 titled 'Impacts on urban water resources of population growth'.

One of the key findings from this report was that water would not necessarily be a constraining factor in our population growing to 32.5 million by 2056 but the paper cautioned that we should not be complacent.

Therefore, the industry must ensure that all major population centres have long term water resource plans that are reviewed on a regular basis to take account of changing contexts. The report highlights measures that need to be taken on both the supply side and the demand side of the water resource equation.

The key factors influencing urban water demand identified in the paper out to 2056 included:

- population growth,
- climate change,
- the design of our cities,
- housing types and density,
- uptake of water efficiency appliances,
- water restrictions and permanent water saving measures,
- increased water prices,
- economic growth, and
- changing demographics.

Residential water consumption kL per capita

	Actual **2009**	Projected **2026**	Projected **2056**
Sydney	74	70	63
Melbourne	57	63	59
Brisbane*	53	73/84	73/84
Adelaide	83	85	71
Perth	106	87	76
Canberra	79	93	78

* For SEQ (including Brisbane) as part of the 2009 SEQ Water Strategy there is a maximum residential per capita consumption daily planning target of 230 litres per person per day. This is the target that underpins the SEQ Water Strategy planning scenarios and would result in projections of 84kL per capita. However, should consumption not increase above 200 litres per person, this would result in projections of 73kL per capita consumption representing a saving of 11kL per year.

See Appendices 1, 2, 3 and 4 for a summary of the key tables and outcomes from the report.

Rising water prices

Water prices continue to rise in capital cities and major urban areas to enable the funding of significant capital works that are required to reduce the risks of climate change and build water systems that are more resilient. Recycled water, desalinated water and stormwater are only just some of the diverse sources of water that are being developed to provide greater water security. Price rises also reflect the cyclic nature of investment in an industry with very long lived assets.

This infrastructure should be paid for by urban water consumers so that they receive a price signal on the value of this precious resource and the investment required to provide reliable supplies for the future.

Over the last six years, even though water prices have been increasing, customer bills have often not increased and in many instances have decreased due to households becoming more efficient in the way they use water. Water bills will remain a very small percentage of household outgoings but this does not mean that there will be sections of the community who will find paying water bills a challenge. Generally, the water utilities have hardship policies for those customers that have trouble paying their water account.

Recent regulatory decision price paths for water and sewerage

The table below outlines the expected increase in water and sewerage bills as approved/forecast by State and Territory regulatory authorities.

Note: real average price increases are the average increase in each year over the period shown, including the first year.

City	Utility	Period	Real average annual bill increase
Sydney	Sydney Water	2008-09 to 2011-12	7.7%
Canberra	ACTEW (water)	2009-10 to 2012-13	1.0%
	ACTEW (sewerage)	2009-10 to 2012-13	4.0%
Melbourne	City West Water	2009-10 to 2012-13	10.9%
Melbourne	South East Water	2009-10 to 2012-13	12.1%
Melbourne	Yarra Valley Water	2009-10 to 2012-13	13.2%
Adelaide	SA Water	2008-09 to 2010-11	Water charges will increase on average by 21.7% in 2010-11, following 17.9% and 12.7% real increases in 2009-10 and 2008–09, respectively
Darwin	Power and Water Corporation	2009-10 to 2011-12	Average bills for water and sewerage are projected to increase by 20% in nominal terms in each of 2009–10, 2010–11 and 2011–12.
Perth	Water Corporation	2009-10 to 2011-12	The Economic Regulation Authority has recommended a real annual increase of 10% for water bills, and 2% for sewerage bills, for each year 2010–11 to 2012–13.
Tasmania	Various	2009-10 to 2011-12	In Tasmania, the Interim Price Order issued in July 2009 instituted annual increases in water and sewerage bills for each year 2009-10 to 2011-12.
Brisbane	Various	2008-09 to 2011-12	In Queensland the government has released forecasts that estimate a real increase of 37% by 2011–12 compared to 2008–09 prices for 250kL customers in Brisbane, and a 32% increase on the Gold Coast.

Source : 2008-09 National Performance Report.
See Appendix 5 for capital cities water prices as at 1 July 2010 and Appendix 6 for water restrictions and water wise rules as at 1 July 2010.

Additional environmental flows for stressed rivers

Although environmental flows are the responsibility of state government natural resource departments the urban water industry is cognisant of its responsibilities to ensure waterways have additional flows in the future to ensure the health of our stressed rivers.

Around Australia, there are examples of water utilities changing the way they manage their water systems to maximise environmental benefits to waterways. In some instances, the introduction of a desalination plant can reduce the need for water extractions from waterways which can result in a positive river health outcome. **Water utilities will continue to work with State Governments to look for future opportunities to improve river health.**

Expectations of increased levels of service i.e. growing affluence

The current generation of Australians are not prepared to put up with the inconveniences that their forebears did earlier last century. There is an expectation that provided water is charged in a manner to recover all the costs of collection, transfer, treatment and distribution, water consumption should not necessarily be 'rationed' by the imposition of restrictions apart from in extreme events such as prolonged dry spells. **Therefore, the urban water industry must respond to this social change and ensure that water supply systems are resilient and deliver the security of supply demanded by customers for which they are willing to pay.**

Cities of the future - taking a fresh look at the resources available in the urban water cycle

The big water and wastewater systems that have served us so well in the past may not necessarily be the best way forward in new suburbs and brown field developments in the future. Much work is being undertaken under the Cities of the Future program which looks at how our cities can be designed better and re-plumbed to ensure that they are more water sensitive and resilient. **The scale of our future urban water cycle systems is still a topic of great conjecture.** Although more decentralised systems have advantages it is unlikely that existing large systems will be decommissioned in the immediate future. Economies of scale need to be taken into account when assessing the costs and benefits of systems.

Moving beyond water restrictions

As the new water sources come online in Australia's large cities the intention is that water restrictions will be removed and will be replaced with water saving rules. **Although sections of the community object to the removal of restrictions, the urban water industry generally believes that restrictions should only be used during exceptionally dry periods.** Managing the transition from restrictions to water saving rules will be a challenge for the industry. The experience of cities that have recently replaced restrictions with water saving rules indicates that consumption has only risen slightly and that a strong water saving ethos remains.

The challenge of the water/energy nexus in a carbon constrained world

Water is required to generate electricity and of course, electricity is required to pump and treat water and wastewater. This means there is a very strong nexus between water and energy, both at the utility and household level. It is imperative that all changes and proposals to the water cycle are evaluated from an energy perspective. The water/energy nexus is particularly strong at the household level as on average in Australia 30 per cent of household energy consumption relates to heating water. **Understanding the nuances of water and energy in a sustainable context will be a key factor in reducing greenhouse gas emissions.**

How our industry is changing

WSAA is at the forefront of facilitating initiatives for a changing industry. These initiatives include: cities of the future; intelligent networks and smart metering and managing complex systems etc.

The achievements of the urban water industry are now recognised internationally.

Cities of the Future

Population predictions by the Australian Bureau of Statistics using their Series B projections indicates that by 2056 Australia will have a population of approximately 35.5 million people. If the population growth follows the more aggressive forecast as outlined in Series A, Australia's population by 2056 will be 42.5 million. There is little doubt that the majority of this population growth will occur in established cities and urban areas, particularly those areas close to the coast.

This population growth comes at a time of great climate uncertainty and the combination of this uncertainty and rapid growth in population represents the perfect storm for the urban water industry.

It is imperative that the planning for our cities to accommodate this increase in population commences now. In the past, the planning for our cities has often been dominated by transport and social infrastructure with water resource considerations being very much an afterthought. **It is essential that a multi-disciplinary approach is taken to planning our cities including new growth corridors and redevelopment sites**. This will ensure that all the disciplines involved in the city planning have a say in the shape and design of our future urban areas.

The Australian urban water industry recognises that we need to develop much stronger relationships and collaborate with all the other institutions and sectors that determine the shape and design of the cities in which we will live in the future.

A key driver for the smart design of our cities is to make them more sustainable in the future. In recognition that the urban water industry needs to be more active in urban design and planning, WSAA and Melbourne Water convened a two day workshop at the AWA OzWater Conference in Brisbane this year. This workshop was different to all other workshops held at the conference because WSAA and Melbourne Water invited representatives from a broad range of disciplines that are involved in designing our cities to ensure a multidisciplinary approach was adopted and outcomes were not overly influenced by the predominance of water industry representatives. At this workshop 12 principles were identified which were considered to be pivotal if we are going to change the way our cities are planned.

More recently, Melbourne Water and WSAA held a one day session on Cities of the Future at the Enviro conference in Melbourne in July 2010. In this session a smaller group of people worked on the actions required to implement the principles identified at the OzWater workshop. These actions

OzWater 10 Conference in Brisbane - delegates consider outputs from working groups

and principles were combined into a document which Rob Skinner, Managing Director, Melbourne Water presented to the World Water Congress in Montreal in September 2010 as Australia's very important contribution to this fast evolving and rapidly changing public policy area.

Cities are very complex and there is little doubt that this complexity will increase into the future. Many people struggle with the concepts of the Cities of the Future program because it involves so much complexity and necessitates taking a long term 50 year perspective.

The best way of explaining what the Cities of the Future program is all about is to identify what some of the key features of Cities of the Future will be in the next 50 years.

The key features that will characterise a change in our planning for cities include:

- cities will have a diverse portfolio of water sources to mitigate climate change risks and to provide resilience to other unpredictable events,
- urban areas will be thought of as water supply catchments and water will be captured and retained as much as possible within the city for a variety of uses,
- open space areas will be irrigated by local water sources and contain many water features and highly vegetated areas to reduce the heat island effect and to improve the aesthetics and liveability of our cities,
- **an integrated approach will be adopted in planning for the urban water cycle including recycled water, surface water sources and stormwater,**
- the urban water industry will be carbon neutral and the industry will be generating significant amounts of renewable energy,
- water sensitive solutions will be adopted at the household and apartment level,
- water efficiency measures and technological advances will ensure that per capita consumption is less than what it is today, and
- our urban rivers and streams will be protected from pollution and damaging peak flow events which cause significant environmental damage to riparian areas.

This list is not exhaustive but does illustrate that a paradigm shift is needed if we want to live in sustainable and attractive urban areas in the future.

It is important to understand that it is unlikely that the existing infrastructure that has served us so well in the past will be decommissioned to allow for the re-plumbing of our cities immediately. Apart from being extremely expensive such a measure would impose enormous disruptions to life in our cities. Therefore it is likely that change will be more evolutionary rather than revolutionary. This point illustrates why we need to start changing immediately the way we plan our cities so that they are more water sensitive sooner rather than later as every day a new development takes place or a new housing estate is established, an opportunity is lost to install the necessary infrastructure to deliver Cities of the Future.

The urban water industry in Australia has already been working towards Cities of the Future.

1. In South Australia, SA Water has been working with the government and recently launched the 30 year plan for Greater Adelaide. This strategy sets out the future shape of Greater Adelaide highlighting the opportunities to transform the city and environs in a way that can meet the growth of the metropolitan area. The focus on creating liveable communities and water sensitive urban design with other climate sensitive initiatives will ensure sustainable outcomes for the future.
2. Barangaroo, in Sydney, is a leadership example for waterfront urban renewal and the role governments can play in delivering sustainability. The 22-hectare industrial site will become a climate positive precinct by being water positive, generating zero waste and achieving carbon neutrality by generating more renewable energy than it uses.
3. South East Water in Melbourne has initiated an integrated water management strategy for a watershed that is home to 1.3 million people. This strategy will include an atlas on non traditional water sources such as recycled water and stormwater in the region, and to link this to potential industrial, agricultural and development uses.

4. The Water Corporation in Western Australia has adopted the vision of 'Water Forever, Zero footprint, Great place.' Water Forever was accompanied by a separate sustainability assessment of all potential source (including recycling) and efficiency options. Water Corporation is in the process of implementing a new Socio-Environment Tool (SET) to assess the sustainability of planning projects. This tool is a form of advanced cost-benefit analysis.

Principles for a water sensitive City of the Future identified at OzWater'10

Theme 1: Liveability for Cities of the Future

Principle 1

Cities will continue to grow in population but will be increasingly localised. A feature of cities will be more interconnected communities.

Principle 2

Sustainable cities will combine a compact footprint with sustainability and 'liveability'.

Principle 3

Water and non-water services will be transformed through integrated planning, resulting in a smaller footprint.

Principle 4

Cities will be resource neutral or generative, combining infrastructure and building design which will harmonise with the broader environment.

Theme 2: The many values of water

Principle 5

Sustainable cities will be served by a well-managed water cycle that – in addition to public health and water security – provides for healthy waterways, open spaces and a green city.

Principle 6

Sustainable cities will recognise that all water is good water – based on the concept of fit for purpose.

Theme 3: Choice, pricing and consumption

Principle 7

Cities will be served by informed, engaged citizenry and multi scale governance that enables local community choice.

Principle 8

Customer sovereignty with full environmental and social cost.

Principle 9

Accurate and useful information, including smart metering.

Theme 4: Adaptive and collaborative water sector

Principle 10

Sustainable cities will be served by adaptive and integrated approaches to urban development.

Principle 11

Sustainable cities will be served by a multi-faceted water management system.

Principle 12

Sustainable cities as part of sustainable regions.

Intelligent networks and smart metering

The existing water and wastewater networks are designed only to operate in pre-set mode. In other words, they can best be described as being 'dumb networks'. The use of Supervisory Control and Data Acquisition (SCADA) systems is wide spread in controlling water and wastewater flows and to monitor for system failure and alarms for a reactive response. There are now emerging technologies that allow the collection of high resolution data and converting this data to knowledge to better manage infrastructure, risk and improve customer service.

Intelligent network solutions are broadly defined as emerging technologies and systems, which have the potential for significant benefit to water service delivery, integrated water management, and customer value enhancement.

The Victorian Water Industry Association has established a Strategy Group to focus industry effort on intelligent networks. The aim is to identify key current and emerging opportunities and develop strategies and programs that facilitate efficient and effective progress of these opportunities.

WSAA has been engaged in preparing for the advent of smart metering and its possible application in the urban water industry in Australia. Through the Metering Codes of Practice project, an industry specification for domestic smart water meters is being developed which has attracted significant international interest from meter suppliers given this is a world first. WSAA is currently seeking feedback from vendors and stakeholders on its technical feasibility.

To the best of our knowledge Australia is the only country to have a nationally agreed specification, based on international open standards, defining a smart water meter which will work with and without the electricity Advanced Metering Infrastructure.

It is generally agreed that smart water meters will provide a shift from a bulk historic reading to real time knowledge, with the potential to add value for consumers and water utilities.

In order to evaluate the opportunities, costs and benefits of smart metering, trials are being conducted in several areas across Australia. Sydney Water in conjunction with Energy Australia is trialing smart meters in 1,000 homes in Sydney, Water Corporation are undertaking a residential trial of 13,000 connected properties across Western Australia. ActewAGL in Canberra is also conducting a trial of 30 homes, Hunter Water have received funding from the Commonwealth for a trial of 400 smart water meters as part of the Smart City, Smart Grid program and the Victorian water industry are investigating the potential of intelligent water networks and several trials are already underway in South East Water's area in Melbourne.

It should be remembered that nearly all water utilities already measure water consumption of the large industrial and commercial customers through automatic meter reading systems.

WSAA will ensure that lessons learnt and the knowledge generated from these trials is shared throughout the industry.

Apart from the potential to design new and innovative tariffs and provide feedback to households on their water use the most significant early benefit of smart metering has been the ability of the smart meters to detect leakages both in the utility managed part of the water supply system and within the households.

A trial of smart meters undertaken several years ago by Wide Bay Water at Hervey Bay in Queensland found that leakage within the property of a customer had been greatly underestimated as many leaks go undetected for a long time.

Consultation with governments and key stakeholders will be imperative to ensure that if smart meters are introduced that there is wide spread acceptance of their benefits and the opportunities they offer householders to better control their use of water.

Managing more complex systems

In the past, water supply systems were relatively simple systems as dams in the hills behind our cities captured surface runoff and water was conveyed by gravity to water treatment plants and, following disinfection, was distributed through a large network of water pipes.

The systems we now manage are much more complex, as there are multiple sources of water in our new supply systems.

Cities, such as Perth, have always relied on multiple sources of supply due to the ready availability of groundwater but on the eastern seaboard water supply systems tended to be based mostly on dams.

The systems we manage today still have dam water as the dominant source of water but there is now often desalinated water, groundwater, recycled water and potentially greater use of stormwater in the mix of multiple supplies comprising our total and integrated water supply system in the future.

It is essential that these more complex and diverse systems are optimised from a triple bottom line perspective including, for instance, reducing net energy use and continuing with community engagement In sustainable water solutions.

More importantly, these systems must be managed to protect drinking water quality given that this is the raison d'être of the water industry. Water from different sources often has different tastes and sometimes consumers believe that a change in the taste of water is a drinking water quality issue which can lead to an increase in water quality complaints. Given that each of the water sources now supplying our cities have different levels of reliability, detailed modelling will be needed to ensure that we achieve optimisation of the total system from a reliability, quality, energy and cost perspective.

Operating in a carbon constrained world

The urban water industry accepts the inevitability of a carbon constrained future whether that constraint is imposed by a tax, regulation or a market mechanism. The industry has been an early mover in this area as exemplified by its history in accounting and publishing the industry's greenhouse gas emissions long before it was a legislative requirement to do so.

The approach of being an early adopter is paying off and the industry is looking to take advantage of the opportunity that a carbon constrained economy represents and at the same time undertake investigations to minimise the downsides such as higher energy prices. The industry is fortunate that it has the opportunity to generate significant quantities of renewable energy through biogas production at wastewater treatment plants and by mini hydro electric generation plants in water distribution systems.

The industry is trialing ways to maximise the production of renewal energy such as accepting higher loads of carbon into the wastewater system so that this carbon can be converted into biogas. Care will need to be taken to ensure that the integrity of the underground assets that convey this waste are not compromised.

It could well be in the future that people will stop at their local wastewater treatment plant to re-fuel their car with renewable biogas!

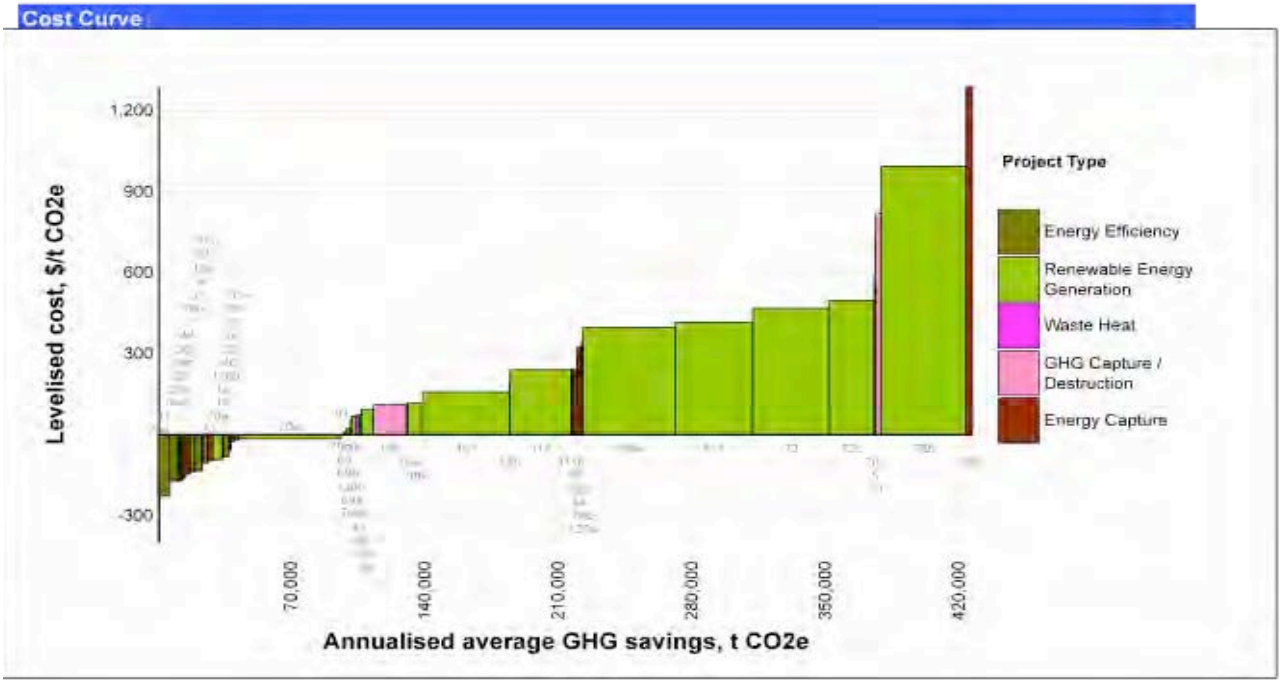
The low hanging fruit in the water energy nexus is in energy efficiency. Given that the industry is a relatively large consumer of energy there will be greater incentives to implement energy efficiency programs and to reduce the industry's greenhouse gas footprint. The industry has a significant focus on energy efficiency and this is challenging many to review operational rules of treatment plants and pump stations to reflect the new reality of a carbon constrained economy.

Many of the water utilities have already committed to become carbon neutral within the next decade or so and it is these ambitious targets that are driving a very strong focus in the industry on reducing energy consumption, developing self-sustaining energy sources and maximising the use of renewable energy. For example, Sydney Water aims to become carbon neutral for electricity and energy consumption by 2020. This includes self-

generating 20 percent of its electricity demand from renewable sources, internal energy efficiency, customer programs and purchase of carbon offsets.

Already each of the desalination plants built or currently under construction in Australia has the greenhouse gas emissions offset either through the construction of renewable energy sources or purchasing green credits.

To assist the industry to adjust to a carbon constrained world WSAA, in conjunction with its members, has been producing tools and products to assist the utilities to understand their greenhouse gas footprints and where the low hanging fruit may exist in reducing these footprints. An example of three tools is provided below.



Scenario Data Table

Period of Evaluation, years	30
Electricity Price Level	Low
Mandatory carbon prices	High
Voluntary carbon prices	High
Avoided costs included	Yes

Project Data Table

	Rank Labels		Descriptive Labels	X	Y	Legend Category				
Manual switch	Rank	Sheet name	Opportunity number	Annualised average GHG savings (30 yrs), t CO2e	Levelised cost, $/t CO2e	Post assessment status	Project Name	Highest risk level	Risk: Project evaluation data	Maximum GHG savings, t CO2e
1	2	O-18b Aeration Gen	18b	2,012	-$161.60	Progress	Aeration General Efficiency Improvements	Medium	Medium	2,262

Energy and Greenhouse Gas (GHG) tools: Cost of Carbon Abatement tool (CCA)

Sydney Water, with the assistance of WSAA, has developed a 'Cost of Carbon Abatement Tool' (CCA Tool) to compare opportunities to reduce greenhouse gas emissions. The CCA Tool is now available under licence to WSAA members.

The CCA Tool enables a water utility to assess its opportunities to reduce greenhouse gas (GHG) emissions in terms of potential volume reduction, associated costs and benefits, and risk.

The CCA Tool is based on the 'McKinsey Cost Curve' developed for nearly all developed nations, but has been built specifically with the urban water industry in mind and is world leading for urban water systems.The CCA Tool helps utilities develop long term carbon abatement strategies and provides a common calculation platform so that users can quickly compare changing forecasts of energy prices, regulatory and voluntary carbon costs and external funding for different abatement opportunities. Outputs of the CCA Tool include a cost curve showing the volume of GHG abatement potential by cost per tonne of emissions and a flexible data table summarising key information for each opportunity.

Greenhouse gas water industry guideline development

The National Greenhouse and Energy Reporting System (NGERS), enacted in 2007, is designed to provide a single, streamlined reporting process for all Federal energy and greenhouse reporting obligations. The first reporting year for National Greenhouse and Energy Reporting Scheme (NGERS) was the 2008/2009 financial year, with the first reports submitted at the end of October 2009. The calculation methodologies for greenhouse gas emissions and energy consumption are defined by the NGERS (Measurement) Determination and accompanying Technical Guidelines (2009). For wastewater treatment facilities, the Technical Guidelines methodology applies various default emission factors to estimate methane and nitrous oxide greenhouse gas production. The current Technical Guidelines are necessarily generic and hence do not provide the required level of detail to adequately address the specific treatment processes used within Australian wastewater treatment plants.

The urban water industry, through transparent and detailed reporting in the National Performance Report, has been recognised by the Department of Climate Change and Energy Efficiency (DCCEE) as one of the first industry sectors capable of developing industry specific reporting guidelines.

This project will prepare a Water Industry Guideline, that provides an agreed approach on the practical implementation of the NGERS legislation, regulations and technical guidelines.

Greenpower and renewable energy discussion paper (DCCEE)

WSAA has been strongly advocating, for the past two years with the DCCEE in relation to stakeholders expressed concerns, that there is insufficient acknowledgement for customers paying for GreenPower or purchasing renewable energy, as the NGERS does not allow these customers to report lower scope 2 emissions.

For the urban water industry in Australia, the use of renewable energy for desalination plants and other facilities is a critical commitment made to offset the energy use and yet the water utilities cannot legally report the reduction in Scope 2 emissions.

Recently the DCCEE released a discussion paper "Treatment of voluntarily purchased renewable energy in the National Greenhouse and Energy Reporting System". The aim of this paper is to seek feedback on the treatment of voluntary renewable energy purchases – notably GreenPower and voluntarily surrendered Renewable Energy Certificates (RECs) – for the calculation of scope 2 emissions under the NGERS. WSAA will be advocating strongly that voluntary renewable energy and Greenpower purchases can be transparently reported in the public domain.

Water sector skills capacity and capability

Water industry capacity and capability is still a major issue in the urban water industry. While the perception that the global financial crisis has taken the immediate heat out of the issue there is no doubt the underlying problems still exist. The ageing workforce is as prevalent in the water industry as it is in many others and potentially has implications for the industry. This is particularly evident in the regional parts of NSW and Queensland where local governments provide water services. The major urban water utilities have been very active in developing workforce capacity and capability and have invested significantly in this space.

As a result of the WSAA Occasional Paper 21 titled 'An Assessment of the Skill Shortage in the Urban Water Industry' released in March 2008 the water industry was forced into action at all levels of government and across all educational sectors. The issue is now firmly on the agenda of the Coalition of Australian Governments (COAG) and as a result the Water Industry Skills Taskforce (WIST) has been formed by the AWA to address one of the most critical challenges of our immediate future. The taskforce is a very high level committee and is represented by Federal Government agencies, peak industry bodies and the private sector to ensure a cohesive approach is adopted.

WSAA is a key stakeholder in shaping the future capability and capacity of the urban water industry by providing critical strategic direction to a number of projects being undertaken across the water industry. WSAA has also been invited to connect with other key advisory groups representing the construction and power industries.

WSAA will continue to ensure that the capacity and capability of the urban water sector is focused on achieving the outcomes expected by its members.

Managing and adapting to climate change brings the industry international recognition

There is growing interest in the achievements of the Australian urban water industry internationally particularly in the United States.

During the year senior managers from utilities and Federal and State Governments participated in numerous forums in the United States relating to strategies implemented to adapt to climate change, water efficiency programs, asset management, energy efficiency and reducing the industry's carbon footprint, just to name a few.

Such events included:

- Australian Water Utilities approach to climate change adaptation and mitigation: Chicago Metropolitan Water Reclamation Department – Science Seminar, October 2009,
- Australian Water Utilities approach to climate change adaptation: 'Sacramento Chamber of Commerce - State of Water in California' Sacramento, October 2009,
- G'day Australia held in Los Angeles in January 2010,
- Water Research Foundation International Climate Change Workshop in Washington DC in February 2010,
- US EPA Climate Change Forum in Arizona, February 2010,
- US EPA WaterSmart Conference, Las Vegas, March 2010,
- Australian Water Utilities approach to climate change adaptation and mitigation: WateReuse Foundation Research Conference: Tampa May 2010, and
- Sustainable Water Sensitive Cities in Australia. Annual American Water Works Association Conference, Chicago, June 2010.

The key reason that the United States water industry has had so much interest in Australia is that climate change has finally started to impact on water systems in the United States. **Australia (and in particular Perth) has had nearly two decades experience in managing water resources in a drying and highly variable climate. The Americans are very keen to learn from our experiences.**

One of the key achievements that we can be proud of in Australia is that we have the National Water Initiative which is our national blueprint for water reform. The United States does not have an equivalent policy document which results in a lack of consistency nationally to implementing water reforms and undertaking the necessary change that will be required to meet the dual challenges of climate change and rapid population growth in urban areas.

Austrade has been active in promoting the Australian urban water industry in the United States and organising delegations of Americans to visit Australia and learn at first hand from our experiences. The industry looks forward to working with Austrade to ensure that we can maximise the value and the flow of information with the United States given the level of interest that exists in the United States on the Australian experience.

Many delegations from China, Japan and South East Asia visit Australia each year to learn about water resource management from the Australian water industry.

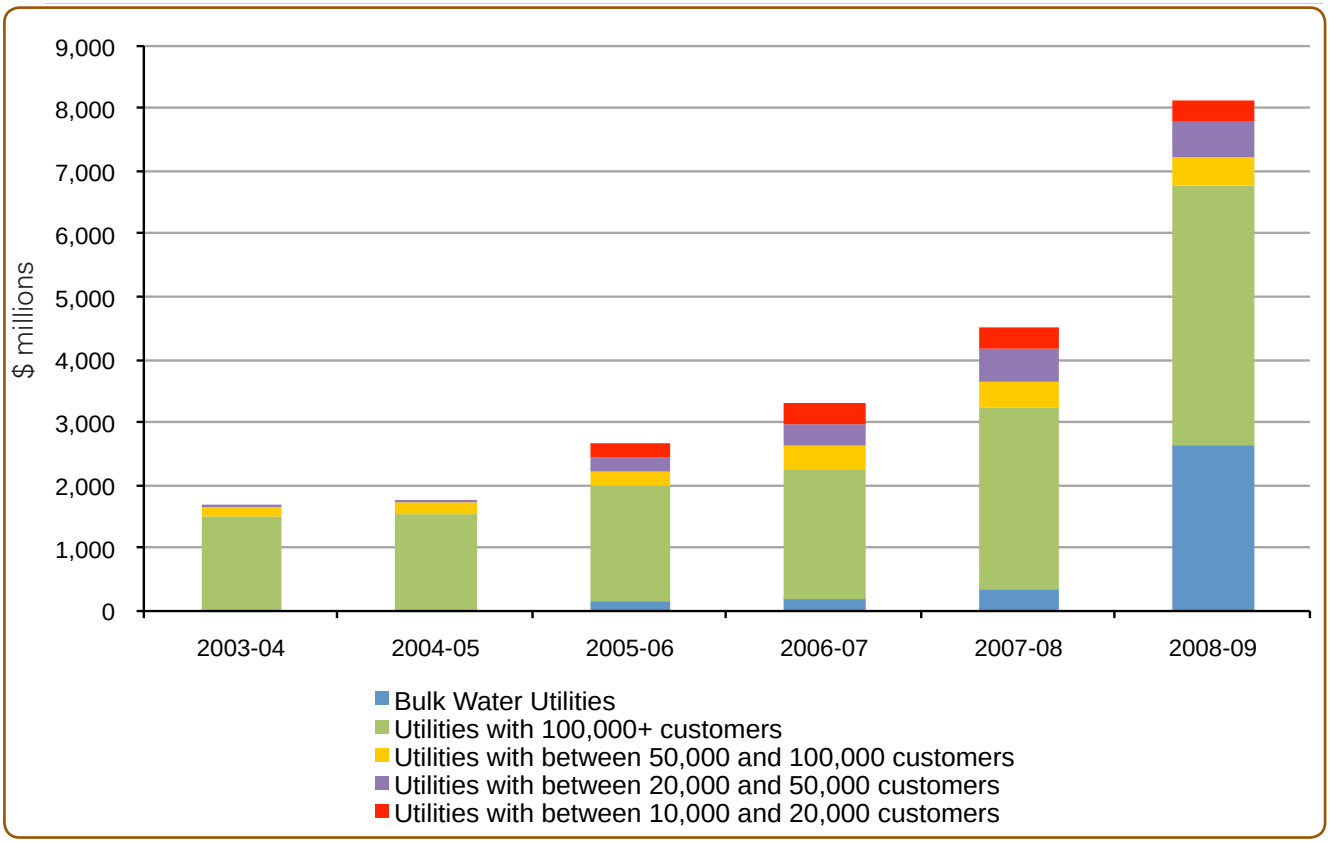
The formation of Water Australia is a significant step forward in establishing stronger business ties on water related areas between the two countries.

In November 2010, WSAA and the United States based WateReuse Association will be co-hosting a major international conference on water recycling and desalination in Sydney. At the time of writing the United States Ambassador in Australia has accepted an invitation to provide the opening address.

Overview of Major projects underway or to be commenced during 2010-11

The last 12 months has seen an unprecedented increase in capital expenditure by urban utilities. The 2008-09 National Performance Report reported that total capital expenditure increased from $4.5 billion to $8.1 billion in 2008-09 which represented an 80 percent increase over a 12 month period. This significant expansion in capital works investment programs can be viewed as the cost of adaptation to climate change.

In this section of the major Report Card the projects being completed or commencing in the capital cities are outlined. It should be noted that even though capital expenditure will reduce in water supply investment, there is a backlog of expenditure required in the wastewater systems which will ensure that capital investment programs will remain at historically high levels at least for the medium term.



Perth

Perth's capital expenditure program is dominated by investment in new water sources and waste-water treatment projects.

Southern Seawater Desalination Plant

A 50GL per annum desalination plant is being constructed near Binningup, south of Perth. The project includes the desalination plant and transfer pipelines required to integrate the project into the Integrated Water Supply Scheme serving Perth and surrounding regions.

Approximate estimated total cost: $955 million.

Beenyup Wastewater Treatment Plant Amplification

This project will upgrade the treatment and disposal capacity from 120ML to 135ML per day to meet customer growth in the catchment. The project is on track for completion in late 2010.

Approximate estimated total cost: $219 million.

Alkimos Wastewater Treatment Plant Stage 1 and Quinns Main Sewer

The Alkimos Wastewater Treatment Plant is required initially to treat wastewater from Perth's North West corridor and the area immediately adjacent to the Alkimos plant. A 20ML per day treatment plant is being constructed to treat initial demand. The Quinns main sewer, treatment plant site works and the ocean outfall are being built for ultimate capacity. The project is on track for completion in late 2010.

Approximate estimated total cost: $336 million.

Wellington Dam Remedial Works

Wellington Dam is the largest surface water storage in the south west of Western Australia and has the potential to become an important source of water for a number of uses. As part of the Corporation's dam safety program remedial works to ensure this concrete gravity dam meets ANCOLD guidelines are being undertaken.

Approximate estimated total cost: $54 million.

Picton Water Treatment Plant Stage 1

A new water treatment plant and associated integration works is being built to service the growth in the area to the south of Perth.

Approximate estimated total cost: $42 million.

Ravenswood Transfer Pump Station

This new 200ML per day pump station is being built to transfer water from the Southern Seawater Desalination Plant and the existing Stirling and Samson Dams through to the Perth Integrated Water Supply System. The pump station will also allow transfer of desalinated water to surface storages at Serpentine and North Dandalup.

Approximate estimated total cost: $76 million.

Southern Seawater Desalination Plant - recent aerial photo of the works area

Melbourne

Melbourne's capital expenditure is dominated by investment in new sources of water and re-cycled water projects. In 2009/10, the Sugarloaf Pipeline was completed boosting Melbourne's supplies by 75 billion litres.

Victorian Desalination Project

Construction of the 150GL per annum plant in Wonthaggi began in September 2009 and was soon followed by construction of the 84kilometres pipeline and 87kilometres power supply. Managed by the Department of Sustainability and Environment's Capital Projects Division, the project is Victoria's largest Public Private Partnership. It will be capable of supplying one third of Melbourne's annual water supply and also make rainfall-independent water available to Geelong and towns in South Gippsland and Western Port. Design and construction is on schedule with water to be delivered by the end of 2011.

Approximate estimated total cost: $3.5 billion.

Northern Sewerage Project

This project is being jointly undertaken by Melbourne Water (Stage 1) and Yarra Valley Water (Stage 2).

Works began in August 2007 on the construction of about 13kilometres of new sewers to increase the system's capacity for the growing northern suburbs. This project will also improve the health of local waterways by protecting them from sewage overflows that can happen after heavy rain. Tunnelling is progressing well and will be completed in the second half of 2010. The five year project is on track to be completed in 2012.

Approximate estimated total cost: $650 million - Melbourne Water $422 million: Yarra Valley Water $228 million).

Northern Sewerage Project - inside a new section

Melbourne Main Sewer Replacement

Melbourne Water is replacing a section of the city's century-old main sewer. The new sewer will travel approximately 2.3 kilometres from Docklands, crossing the Yarra River upstream of the Charles Grimes Bridge and into Port Melbourne. It will meet the needs of the city's increasing population for the next century and help protect the health of rivers including the Yarra. Construction started in August 2008. The crossing of the Yarra River reached its halfway milestone in May 2010, and the first tunnel breakthrough was achieved in June 2010. The four year project is due to be completed in 2012.

Approximate estimated total cost: $220 million.

The coffer dam at the Melbourne Main Sewer Replacement crossing of the Yarra River

Eastern Treatment Plant - Tertiary Upgrade

This upgrade will transform the sewage treatment plant into one of the most sophisticated facilities of its kind in the world. The plant will be able to treat wastewater to Class A standard which will significantly improve the quality of treated water discharged into Bass Strait and enable more water to be recycled for non-drinking purposes. Construction started in May 2010 and is expected to be completed by the end of 2012.

Approximate estimated total cost: $380 million.

Eastern Treatment Plant - Tertiary Upgrade - work begins on the foundations for the biological media filters as part of the upgrade.

West Werribee Recycled Water

This project will see three billion litres of wastewater from the Western Treatment Plant in Werribee treated to Class A standard and piped through a separate "purple pipe" system to nearly 20,000 households in one of the fastest growing areas in the country. The project includes a water treatment facility which will remove salts and other contaminants. Work is expected to begin on the project later in 2010 with recycled water available for use in 2013.

Approximate estimated total cost: $114 million.

Altona Recycled Water Project

Construction started in October 2009 on an upgrade of City West Water's Altona treatment plant to clean up wastewater from the plant and pipe it to nearby industrial manufacturing sites, sporting clubs and councils. The project will produce 2.5 billion litres of Class A recycled water a year and will reduce the amount of wastewater discharged from the Altona Treatment Plant into Port Phillip Bay. Recycled water is scheduled to be supplied to customers by the end of 2010.

Approximate estimated total cost: $46 million.

Melbourne to Geelong Pipeline

In 2010 work will begin on a 59-kilometre pipeline to connect Geelong to Melbourne's water supply system. This is a key new link in the Victorian Water Grid. The pipeline will deliver 16 billion litres of water each year to Geelong, which is close to a 50 per cent increase for this important regional centre. The connection to Melbourne will allow Geelong to share in the water created from the desalination plant in Wonthaggi. Completion is expected in 2011

Approximate estimated total cost: $138 million.

Sydney

The capital program for Sydney was developed using a rigorous review process to meet customer, regulatory and environmental requirements in Sydney Water's Corporate Plan and to deliver several key outcomes outlined in NSW Government's Metropolitan Water Plan.

The capital program comprises:

- the construction of new assets for population growth,
- delivery of recycled water schemes,
- sewering remote villages,
- delivery of odour control works, and
- renewal of vital water, wastewater and stormwater assets.

Freemans Reach, Glossodia and Wilberforce Sewerage Scheme

This scheme involves the construction of a pressure sewerage system. It will provide around 1,660 properties with sewerage connections while aiming to protect the environment and reduce risks to public health. Construction is underway and anticipated to be completed for all three towns by mid 2011.

Approximate estimated total cost: $138 million.

North West Growth Centre First Release Precincts

This project includes; construction of approximately 23 kilometres of drinking water and new drinking water reservoir and sewers for the first release precincts in Riverstone, Alex Avenue and North Kellyville. Design work has been completed. Construction work is underway and anticipated to be completed by early 2011.

Approximate estimated total cost: $128 million

One of the large new drinking water reservoirs for this growth area under construction

Hoxton Park Recycled Water Stage 1

This scheme will add to potable water savings by providing new dwellings, industrial users and irrigation customers with recycled water. It includes laying approximately 21 kilometres of pipelines and augmentation work at Glenfield Sewage Treatment Plant. Construction is underway and expected to be completed by mid 2013.

Approximate estimated total cost: $99 million.

Dual pipes and meters

Hawkesbury Heights and Yellow Rock Sewerage Scheme

This scheme involves the construction of a pressure sewerage system and will provide around 340 properties with sewerage connections. The scheme aims to protect the environment and reduce risks to public health. Construction has commenced and anticipated to be completed by the end of 2010.

Approximate estimated total cost: $61 million.

Warriewood Sewage Treatment Plant Upgrade and Amplification

This project will improve reliability of operation at Warriewood Sewage Treatment Plant and increase capacity to cater for predicted growth in the Pittwater area. Construction is anticipated to start in mid 2011 and be completed by late 2012.

Approximate estimated total cost: $31 million.

A secondary treatment tanks at Warriewood nearing capacity and indicating the need for amplification

Winmalee Sewage Treatment Plant Renewal and Modification

This project provides advanced tertiary treatment at Winmalee Sewage Treatment Plant, enhances the reliability of plant operations and reliably meets current licence requirements. Construction is underway and anticipated to be completed by the end of 2010.

Approximate estimated total cost: $16 million.

Asset Infrastructure Renewals

Sydney Water is delivering a significant renewals and rehabilitation program across a range of asset types comprising: $120 million per year to renew critical water mains and water reticulation mains; $60 million per year to rehabilitate critical sewer mains; $30 million per year to renew water and wastewater treatment facilities; and $25 million per year to renew water and wastewater pumping stations.

Asset Infrastructure Renewals - a replacement and larger sewage pumping station being built next to the old station

South East Queensland

South East Queensland's capital expenditure is dominated by investment in the water grid, upgrade of the Hinze Dam and delivery of the Wyaralong Dam.

Hinze Dam Stage 3

The Hinze Dam was first constructed in 1976 providing a storage capacity of 42 ML. This was increased to 161 ML with the completion of Stage 2 in 1989. The Stage 3 project will raise the Hinze Dam embankment wall from 94 metres to 109 metres, providing a total storage capacity of 310 ML (about 820,000 Olympic sized swimming pools). Seqwater, the service provider responsible for the project, is moving forward with the Stage 3 upgrade of the Hinze Dam as a priority project. The upgrade will serve two purposes; it will provide additional water storage thereby increasing the water supply security for the region, and secondly it will mitigate against potential flooding in the Nerang River catchment. Hinze Dam Stage 3 is due for completion by 31 December 2010.

Approximate estimated total cost: $395 million.

Wyaralong Dam

The Wyaralong Dam is an integral part of the Queensland Government's plan to ensure a safe and sustainable water supply for South East Queensland's growing population. The Wyaralong Dam, being delivered by Queensland Water Infrastructure, will work in conjunction with the Cedar Grove Weir and the Bromelton Offstream Storage to improve reliability of the Logan River Water Supply Scheme in drought conditions. In addition, this will also help meet the Beaudesert area's growing demand for water from urban and industrial development and provide additional supply for the South East Queensland Water Grid. Due for completion by mid 2011, the Wyaralong Dam will supply 21,000 ML per annum (when operated in conjunction with Cedar Grove Weir).

Approximate estimated total cost: $348 million.

Hinze Dam Stage 3 upgrade works in progress

Northern Pipeline Interconnector Stage 2

The Northern Pipeline Interconnector (NPI) is part of the South East Queensland Water Grid.

Stage 1 was completed in December 2008 and pumps water from the Morayfield reservoirs to the Landers Shute Water Treatment Plant.

NPI - Stage 2, being delivered by LinkWater Projects, a wholly government-owned company, will connect the Stage 1 termination point near Lander's Shute Water Treatment Plant to the Noosa Water Treatment Plant at Lake Macdonald. Once the Stage 2 pipeline is operational, it will contribute up to 18 ML per day (6,500 ML per annum) to the total 65 ML per day that the NPI is targeted to deliver to Brisbane.

The Stage 2 project consists of approximately 48 kilometers of bi-directional pipeline and associated facilities. The project has a footprint of approximately 148 hectares and includes a 30 meter wide pipeline corridor, four pump stations, one balance tank and two water quality boosting facilities. NPI - Stage 2 construction is due for completion by 31 December 2011.

Approximate estimated total cost: $440 million.

Adelaide

Adelaide's capital expenditure is dominated by investment in new sources of water.

Adelaide Desalination Plant

Construction of a 100 GL per annum plant is on track for completion in 2012. Delivery of first water supply is scheduled for early 2011. This will diversify and secure Adelaide's water supply.

Approximate estimated total cost: $1.83 billion.

Adelaide Water Network – North/South Interconnection

Project optimises distribution of desalinated water throughout the Adelaide metropolitan network and improves water security. This project includes a nominal 40kilometres of new and upgraded trunk water mains and associated pumping stations.

Approximate estimated total cost: $403 million.

Southern Urban Reuse Project

Project to increase the capability to supply recycled water to a number of southern suburbs of Adelaide. This project includes a 700 ML storage lagoon and field pump stations. On track for completion in 2011.

Approximate estimated total cost: $63 million.

Christies Beach Wastewater Treatment Plant Capacity Upgrade

Project to increase capacity to meet the demand of population growth and to improve environmental outcomes. Commissioning is due in 2011. Includes works to convert the sludge lagoons to a wetland and install a membrane bio-reactor plant.

Approximate estimated total cost: $272 million.

Mullers & Regency Rd Trunk Water Main Renewal

Project to close-fit line 4.9kilometres of DN600 trunk water main. This renewal methodology will be the first of its kind nationally for a PN16 rated pipe of this diameter and string length up to 620 metres.

Approximate estimated total cost: $12 million

Adelaide Desalination Plant's Reverse Osmosis Building 1 under construction

Canberra

Canberra's capital expenditure is dominated by investment in water supply.

Enlarged Cotter Dam

This project involves building a new dam wall downstream of the existing one to increase the Cotter Dam's capacity from 4 GL to around 78 GL; a 20-fold increase.

Murrumbidgee to Googong Transfer

The Murrumbidgee to Googong Transfer project involves pumping up to 100 ML per day of water from the Murrumbidgee River at Angle Crossing within the ACT and transferring it through an underground pipeline to Burra Creek in New South Wales.

Googong Dam Spillway

This remediation will bring the structure into line with modern design and safety standards.

Cotter and Murrumbidgee River Pumping Station

The project is to upsize and reconfigure the Cotter pump station suction and discharge mains to integrate with requirement for the Enlarged Cotter Dam, Murrumbidgee Pump Station and other proposed works.

A further project underway to install a new 44 ML per day pump as Pump 10 at the Cotter Pump Station to provide the capacity to reliably supply water in excess of 100ML per day (with one pump on standby) from the existing Cotter Dam and Murrumbidgee River. This project is expected to be completed in October 2010.

Lower Molonglo Water Quality Control Centre Secondary Treatment Upgrade

The sewerage treatment facility required upgrading to cater for future growth in population and load. The project includes three secondary clarifiers, additional bioreactor tanks and associated pump stations and chemical dosing facilities.

Recent aerial photo of Cotter Dam at 100% capacity with enlargement works in the foreground

Looking forward

This section looks at some of the significant issues the industry will be working on during the next year

Capital investment prioritisation

Managing a large and diverse capital program presents a number of challenges for the urban water industry.

These challenges include:

- ensuring the appropriate level of sustainable investment is provided with limited capital funds and resources,
- meeting current and changing regulatory requirements,
- ensuring service standards are maintained,
- accommodating rapid population growth amidst climate change,
- providing confidence to stakeholders including boards, shareholders and regulators in the development and delivery of capital programs, and
- maximising value to shareholders and the community.

The urban water industry acknowledges the importance of capital prioritisation. WSAA is in the process of developing a common set of principles and guidelines to assist major urban water utilities continuously improve the way capital programs are prioritised and managed to meet current and future infrastructure needs.

These principles and guidelines will enable all WSAA members to establish a robust and transparent prioritisation process more efficiently by drawing on shared knowledge and experience.

Potential for competition in urban water markets

The urban water industry is open to the notion of more competitive frameworks provided that the case is made for how such a reform would improve customer outcomes. The industry recognises the role played by the private sector in water recycle services and welcomes initiatives to create opportunities for competition where ever appropriate.

The industry is of the view that a study should be undertaken to model exactly how reforms would operate and how perverse outcomes could be avoided.

Caution is required in this area as there are no working urban water markets anywhere in the world. It is paramount that the reform program is not progressed on ideological grounds but must satisfy the ultimate test that 'marginal social benefits exceed marginal social costs'.

WSAA is also aware that when the electricity industry was being reformed the then industry commission spent 12-18 months investigating which part of the electricity industry was a natural monopoly, which part was contestable, who was going to be responsible for planning, who was going to be the supplier of last resort and how perverse outcomes could be prevented. To WSAA's knowledge none of this work has been undertaken for the urban water industry.

WSAA looks forward to participating in the Productivity Commission Inquiry into urban water over the next 12 months.

Scarcity pricing

Market driven scarcity pricing for bulk water is touted by many economists as being the ideal tool to ensure that customers are receiving the appropriate price signals and that pricing can be used to regulate demand during extreme dry weather events. Although prima facie this approach looks very attractive, the concept does require close examination. The assumption often made when proposing scarcity pricing is that the dams will only stay low for a relatively short period of time before rainfall returns to replenish them. An analysis of the rainfall records over the last 15 years of climate change shows that this is definitely not the case. An ABARE study modelled on Canberra showed just how expensive water would become during a prolonged dry period. Furthermore, in those States and Territories where tenants do not receive a water bill, regardless of how expensive water is, there will be still no price signal to this category of water consumer.

It is essential that any analysis of scarcity pricing takes into account the price impacts on customers.

Development of third party access regimes

WSAA generally supports State based third party access regimes but has a preference for these access regimes to be nationally consistent in principle so that entities that operate across Australia don't confront fundamentally different rules in each of the States and Territories. WSAA also notes that such a third party access regime already exists in New South Wales and is currently being introduced in Victoria and South Australia. A third party access regime makes the application process simpler compared to Part III A of the Trade Practices Act which should provide greater incentive for investors to apply for access to water and wastewater networks.

Customer Services Process Benchmarking

A customer services process benchmarking project will be conducted in 2011. This project will identify and address key customer service industry issues through the development of improvement initiatives. It also aims to recognise and share best practices to improve service offerings and to further drive efficiencies. Establishment of strong information sharing networks is also a key objective.

The last WSAA customer services process benchmarking project was conducted in 2007 and involved 16 participants spanning Australia, New Zealand, Hungary, Portugal and the United States. Customer services has been a critical part of WSAA's rolling program of process benchmarking which has included asset management, mechanical and electrical maintenance and civil maintenance.

WSAA projects for 2010-11

The WSAA Board has appointed three committees to oversee WSAA programs and activities. The three committees are chaired by members of the WSAA Board and comprise Asset Management, Water Quality and Health and Environment and Sustainability. Each of these committees has a strategic plan which outlines the priorities in relation to research and projects.

Below are the projects that each of the three committees will be undertaking during 2010-11.

Environment and Sustainability Committee:

- prepare submission to Department of Climate Change and Energy Efficiency (DCCEE) regarding reporting renewable energy and voluntary actions under NGERS,
- develop a greenhouse gas and climate change 'wikipedia',
- develop water industry guidelines for NGERS reporting and calculator,
- prepare occasional paper for best practice energy efficiency for the urban water industry in Australia,
- develop water industry KPIs for scope 1 and 2 emissions reporting,
- energy and cost of carbon forecasting for electricity, network charges, carbon and renewal energy certificates, and
- develop a sustainability intelligence port tool for the urban water industry.

Water Quality and Health Committee:

- finalise laboratory proficiency testing study,
- develop a guidance manual for implementing the WSAA National Water Wastewater Source Management Guideline,
- prepare a position paper on the chemical registration process reflecting impacts on infrastructure, water recycling and eco-system health,
- prepare an occasional paper on the impact of climate change on water quality of different sources,
- continue ongoing development of a water industry tool box including Aquality, Requality and ReusePlanner,
- develop national approach to validation requirements for recycled water systems, and
- contribute to the Water Treatment Alliance.

Asset Management Committee:

- develop a decision support tool for Condition Assessment Guidelines for the condition assessment of pressurised pipelines,
- review Risk Management including guidelines supported by industry case studies,
- review Leakage Reporting and Management Practices including guidelines and software tools to assist with leakage reporting and management,
- review Linear Polarisation Resistance for determining the condition of pressurised ferrous pipelines,
- adapt the UKWIR International Water Mains Failure Database to suit the needs of Australian utilities,
- develop a practical guide to Condition Assessment of Water Main Appurtenances,
- develop a guidance procedure for the analysis and management of sewer blockages,
- develop strategies for the management of Asbestos Cement Pipes,
- conduct an industry survey and workshop identifying current practice for cathodic protection,
- prepare a report on current practice on pipeline asset and risk management planning,
- report on consolidating previous infiltration/ inflow investigations and identification of current practice.
- represent Australia in the development of an International Standard for Asset Management,
- develop Metering Codes of Practice in collaboration with the National Measurement Institute, and
- revise the Sewerage Code of Australia, Vacuum Sewerage Code of Australia and Sewage Pumping Station Code of Australia.

Conclusion

It has been another successful year for the Australian urban water industry. With record capital investment, the industry is well down the path of diversifying its sources of water so that our cities are not solely reliant on rainfall. It is often forgotten that a significant proportion of this capital investment is devoted to the wastewater system, particularly related to environmental compliance and infrastructure required to service growth in our rapidly growing cities.

As more resilient water supply systems are put in place, water restrictions should not be necessary. A water saving ethos will remain through the implementation of water saving rules.

Managing all of the issues associated with carbon and greenhouse gas emissions now consumes considerable resources in the utilities recognising the importance of this topic both nationally and internationally. The industry is reaping the dividends of being an early adopter in this area and has now developed significant expertise in reducing energy consumption, maximising the generation of green energy and implementing climate adaptation programs.

The bounce back in the Australian economy following the global financial crisis means the industry cannot be complacent about skills development and programs to attract and retain highly skilled staff.

A number of processes will occur over the next 12 months that could well result in reform proposals for the industry.

The urban water industry has an excellent track record in reform. The 1994 COAG water reforms were all delivered (with the exception of the inclusion of externalities in water prices) and the industry has assisted the National Water Commission in undertaking actions contained in the National Water Initiative. More recently, the industry has been assisting the Department of Environment, Water, Heritage and the Arts in progressing the actions in the COAG enhanced national Urban Water Reform Framework agreed by COAG in late November 2008.

Implementing past reforms has provided the industry with the solid foundation it has today which has enabled it to be able to change quickly and increase investment significantly to mitigate the risks of climate change and population growth.

WSAA looks forward to its involvement in the reform processes and will work to ensure that reforms are aimed at improving customer outcomes, continued protection of public health, protecting the environment and building on the existing sustainability initiatives so that Australia's excellent reputation in urban water resource management is further

Appendices

Appendix 1: ABS population projections (000's)

	Observed	Series A	Series B	Series C	Series A	Series B	Series C
	2007		2026			2056	
Sydney *	4 282.0	5 487.2	5 426.3	5 358.2	7 649.0	6 976.8	6 565.2
Melbourne	3 743.0	5 272.3	5 038.1	4 861.7	7 970.7	6 789.2	6 100.9
Brisbane *	1 819.8	2 908.0	2 681.1	2 465.6	4 955.1	3 979.3	3 237.0
Adelaide	1 145.8	1 410.8	1 384.5	1 391.8	1 848.5	1 651.8	1 623.7
Perth	1 518.7	2 455.2	2 267.6	2 112.1	4 164.4	3 358.4	2 815.5
Australian Capital Territory	334.1	462.5	416.5	373	683.2	509.3	374.2
Hobart	207.4	266.8	245.3	228.2	367.2	279.7	224
Darwin	117.4	189.3	165.2	142.4	334.9	243	169.2
Total capital cities	13 373.4	18 452	17 624.7	16 933	27 973	23 787.5	21 109.6
Australia	**21 015**	**28 723**	**27 236.7**	**25 971.9**	**42 510.4**	**35 470**	**30 906.1**

3222.0 - Population Projections, Australia, 2006 to 2101

*Note: ABS Brisbane population projections have not been used to develop total urban water supplied projections. High and medium population projections for Brisbane have been sourced from the Planning Information and Forecasting Unit (PIFU), Department of Infrastructure and Planning SEQ forecasts from 2006 to 2051; Queensland's future population 2008 edition.

* Note: ABS population data is not the data for the Sydney Water area of operations, but accounts for the Sydney ABS statistical region.

***South East Queensland Population forecasts (000's)**

	Observed	High Series	Medium Series	High Series	Medium Series
	2008	2026		2056	
South East Queensland	**3,043**	**4,609**	**4,204**	**7,015**	**5,696**

Source: Planning Information and Forecasting Unit (PIFU), Department of Infrastructure and Planning SEQ forecasts from 2006 to 2051; Queensland's future population 2008 edition.

Appendix 2: Residential water consumption kL per capita

	Actual **2009**	Projected **2026**	Projected **2056**
Sydney	74	70	63
Melbourne	57	63	59
Brisbane*	53	73/84	73/84
Adelaide	83	85	71
Perth	106	87	76
Canberra	79	93	78

* For SEQ (including Brisbane) as part of the 2009 SEQ Water Strategy there is a maximum residential per capita consumption daily planning target of 230 litres per person per day. This is the target that underpins the SEQ Water Strategy planning scenarios and would result in projections of 84 kL per capita. However, should consumption not increase above 200 litres per person, this would result in projections of 73 kL per capita consumption representing a saving of 11kL per year.

Appendix 3: **2026** Projected total urban water consumption (GL)

2026	Actual 2009 GL	Series A GL	Series A % change from 2009	Series B GL	Series B % change from 2009	Series C GL	Series C % change from 2009
Sydney	492	620	26%	613	25%	605	23%
Melbourne	360	535	48%	511	42%	494	37%
South East Queensland	223	536	141%	494	122%	494	122%
Adelaide	138	178	29%	174	26%	175	27%
Perth	250	308	23%	284	14%	265	6%
Canberra	42	66	57%	59	41%	53	27%
Total	**1,505**	**2,242**	**49%**	**2,136**	**42%**	**2,086**	**39%**

Note: South East Queensland 2026 projections have been sourced from the 2009 South East Queensland Water Strategy. No low growth population projection has been formulated within the 2009 South East Queensland Water Strategy. Therefore, the medium series (equivalent to Series B) has also been used for Series C in the table above.
73kL per capita consumption has been used to develop 2026 South East Queensland projections.
If 84kL per capita consumption had been used, the following projected volumes for 2026 would be:
Series A 591GL, Series B 545GL and Series C 545GL.

Appendix 4: **2056** Projected total urban water consumption (GL)

2056	Actual 2009 GL	Series A GL	Series A % change from 2009	Series B GL	Series B % change from 2009	Series C GL	Series C % change from 2009
Sydney	492	778	58%	709	44%	668	36%
Melbourne	360	760	111%	647	80%	582	61%
South East Queensland	223	848	281%	693	211%	693	211%
Adelaide	138	194	41%	174	26%	171	24%
Perth	250	456	83%	368	47%	308	23%
Canberra	42	81	95%	61	45%	45	7%
Total	**1,505**	**3,117**	**107%**	**2,652**	**76%**	**2,466**	**64%**

Note: South East Queensland 2056 projections have been sourced from the 2009 South East Queensland Water Strategy. No low growth population projection has been formulated within the 2009 South East Queensland Water Strategy. Therefore, the medium series (equivalent to Series B) has also been used for Series C in the table above.
73kL per capita consumption has been used to develop 2056 South East Queensland projections.
If 84kL per capita consumption had been used, the following projected volumes for 2056 would be:
Series A 933GL, Series B 762GL and Series C 762GL.

Appendix 5: Capital cities' water prices as at 1 July 2010

City	Fixed Charge (Annual)	Quantity	Usage Charge
Adelaide	$142.40	0 to 30kL 30-130 kL >130 kL	$1.28 per kL $2.48 per kL $2.98 per kL
Brisbane	$162.92	0 to 255 kL 256 to 310 kL >310kL	$0.65 per kL $0.69 per kL $1.23per kL
Canberra	$92.08	0 to 0.548 kL per day >0.548 kL per day	$2.00 per kL $4.01 per kL
Melbourne	$75.29 to $154.13	(0-440 litres/day) (441-880 litres/day) (881 + litres/day)	$1.51-$1.54 per kL $1.80-$1.84 per kL $2.66-$2.97 per kl
Perth	$186.60	0 - 150 kL 151 - 350 kL 351 - 550 kL 551 - 950 kL over 950 kL	$0.726 per kL $0.88 per kL $1.02 per kL $1.537 per kL $1.779 per kL
Sydney	$102.00	NA	$1.87 per kL
Hobart	Based on property value		No usage charges
Darwin	$164.47	NA	$1.07 per kL

Source: Water utility websites

Appendix 6: Water restrictions and Water Wise Rules in capital cities as at 1 July 2010

City	Level	What's Permitted
Brisbane	Permanent Water Conservation Measures	Hand held hose must be fitted with a trigger nozzle. Hand held hose can be used on any day before 10am and after 4pm. Sprinklers may be used up to 30 minutes if they have a timer and emit less than 9 litres per minute.
Sydney	Water Wise Rules	Hand held hose must be fitted with a trigger nozzle. Hand held hose and drip irrigation can be used on any day before 10am and after 4pm. Cars should be washed on the lawn where possible.
Adelaide	Stage 3	Hand held hose must be fitted with a trigger nozzle. Hand held hose can be used on any day between 7-10am and 4-7pm for a maximum of 7 hours per week. Cars may be washed with a bucket.
Melbourne	Stage 2	Gardens can be watered by using a trigger-nozzle fitted hose, watering can or bucket at any time. Automatic watering from midnight to 4am. Garden watering is on an odds and even basis. Lawns must not be watered at any time with drinking water. Cars may be washed at home with either a bucket or a high pressure, water saving device.
Perth	Permanent Water Efficiency Measures	Sprinkler rosters apply to scheme and bore water uses in Perth as part of the permanent water efficiency measures in place since 2007. The roster system is based on watering either before 9 a.m. or after 6 p.m. two days per week (for scheme) and three days per week (for bore). Total sprinkler bans also apply during the winter months between June and August, for scheme and bore users. These measures reflect community support for sustainable watering practices.
Canberra	Stage 2	A hand held hose fitted with a trigger nozzle, a bucket, a watering can or a dripper system may be used to water lawns and plants between 7am and 10am and between 7pm and 10pm on alternate days as per the "odds and evens" system. No sprinkler or other irrigation systems may be used.

Source: Water utility websites

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