WATER SERVICES ASSOCIATION
OF AUSTRALIA

Submission to Productivity Commission Issues Paper: Australia's Urban Water Sector

November 2010

PRICEWATERHOUSECOOPERS

Acknowledgement

The Water Services Association of Australia (WSAA) acknowledges the assistance of PricewaterhouseCoopers (PwC) and the WSAA membership in preparing this submission to the Productivity Commission's review of Australia's urban water sector. The views expressed in this submission reflect those of WSAA and its membership.

All inputs to this report, including water industry data and statistics have been provided by WSAA and its members and PwC has not attempted to verify their accuracy or undertake additional primary research.

Contents

1. Foreword

It was the 1994 COAG water reforms that laid the foundation for the very successful and progressive urban water industry that exists today. It should be remembered that all of the urban milestones (with the exception of including externalities in water prices) were achieved. It is often forgotten that prior to these reforms customers paid for water on the basis of the value of their property. We have come a long way.

In 2004 the National Water Initiative was developed and once again the urban water industry set out with great enthusiasm to assist the National Water Commission in implementing the urban components of the reform package. More recently, COAG approved the work program on water – urban water reform actions and again the industry moved quickly to assist the National Water Commission and the Federal government in implementing actions.

From this brief review of recent history it is clear that the urban water industry has a proud record of implementing reform. Our industry is cognisant of the reality that if you do not continually change in a rapidly changing world you lose control of your own destiny. It is in this context that the Water Services Association of Australia (WSAA), the peak body that represents the largest urban water utilities in Australia welcomes the Productivity Commission's review of the urban water sector.

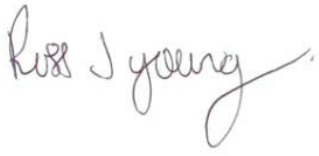
The industry is definitely not broken– witness the industry's response to a drying climate, including investing $30 billion to create a diversified portfolio of water supply sources. However, it is healthy from time to time to have outsiders to look at an industry and provide a different perspective. The Australian urban water industry has an excellent reputation both within Australia and internationally. Indeed, Australia leads the world in many aspects of urban water management such as adaptation to climate change, managing leakage, implementing water efficiency programs and adjusting to a carbon constrained world, to mention just a few.

There is no doubt the water and wastewater systems in the future will be different from those that exist today. The industry is therefore positioning itself to lead again in the area of integrated water management. This is in response to the recognition of our growing exposure to future climate change shocks and aligns well with the positions being articulated by our Commonwealth and State leaders who espouse the need for more sustainable and liveable cities for Australia. The water sector understands that conventional water and urban planning processes will not necessarily deliver these 'cities of the future', and that transformational change is required to better integrate this planning.

It is essential that the urban water industry has the appropriate institutional and regulatory arrangements to support the significant challenges confronting the industry such as climate change and population growth.

We are confident that the Productivity Commission review will have positive benefits for the industry and will ensure that the progressive and innovative reputation of the industry will be enhanced.

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 enhanced.



Ross Young
Executive Director, WSAA

2. Executive summary

In this submission, the Water Services Association of Australia (WSAA) strongly advocates the following:

Water management and planning

- The continuing development of a diverse portfolio of water supply options to mitigate climate change risks and maximise community value by contributing to cities that are more sustainable, liveable and prosperous.
- Community and stakeholder consultation during the preparation of water planning strategies.
- The removal of policy 'bans' imposed by some State Governments to rural-urban water trading and indirect potable re-use. It is essential that all water supply/demand options are thoroughly evaluated according to their merits.
- Significant opportunities for efficiency gains in water planning are likely to flow from greater clarity from governments and policymakers in terms of targets, standards, regulation and licensing as compliance with these requirements is a key driver of capital and operating expenditure.
- Many of the reforms now accepted for the major metropolitan areas – including independent regulation and commercially autonomous management of utilities – are absent in some regional areas. This has created problems such as a lack of effective regulatory incentives and sanctions, an absence of functional separation, a lack of capital, commercial focus, skills and technology.
- Where Governments assume responsibility for urban water planning, they must be adequately resourced with skilled staff to remove the information asymmetry that currently exists between utilities and government policy and resource management agencies.
- The International Water Association's (led by WSAA and Melbourne Water in Australia) *Cites of the Future* program recognises that water and its interactions with other urban sectors – particularly urban planning – is a central focus in the development of sustainable cities. These linkages need to be incorporated in water planning arrangements.
- Planning frameworks should make it clear who is ultimately responsible for the planning of water and wastewater systems, ensuring accountability for decisions.
- There are a variety of institutional forms in place across the urban water sector and they impact on the efficacy of different planning frameworks. Concepts of institutionally-separated independent planning authorities may have more relevance where there already are multiple utility agencies involved in the supply chain.

Water pricing and consumption

- Achieving full cost recovery in water and wastewater pricing in cities and regional areas must be a continued focus for Governments. Despite widespread agreement to the principles of full cost recovery, the practical application of this is lacking, particularly in regional areas but also in some metropolitan centres.
- Likewise, adoption by all water service providers of the COAG Water Planning Principles needs continued attention.
- WSAA is cautious of the merits of scarcity pricing as a tool to reduce demand. Additional work needs to be undertaken in relation to the effectiveness of scarcity pricing in managing demand and encouraging new supply augmentation, and customer-level impacts also need to be understood.
- There are some limitations in current technology (metering, in particular) and institutional arrangements which present as significant impediments to future tariff reforms.

- Water restrictions are an inefficient, blunt instrument and impose a significant cost on the community

Regulation of the urban water sector

- Independent economic regulation and the removal of political interference in pricing of water services should continue to be pursued as necessary conditions for efficient and effective service delivery.
- The Productivity Commission's inquiry could usefully examine the merits of a single national economic regulator for water services. If this is not possible then mechanisms should be explored to ensure State and Territory regulators adopt and consistently apply national principles.
- Streamlined environmental, public health and economic regulation frameworks are needed to remove areas of regulatory duplication between the States and Territories and the Commonwealth.
- The likely increased future reliance on 'non conventional' sources of supply and the adoption of an integrated water planning approach highlights the importance of ensuring clarity of regulatory requirements, and of a collaborative approach to developing the necessary guidelines for water use, including personal consumption.
- Impact assessments of regulatory proposals that take account of full costs and benefits, having regard to the impact of environmental regulation on the urban water sector.

Industry structure and the promotion of competition

- A stronger evidence base would be needed to support any move towards structural separation as a means of encouraging retail contestability.
- Following on from NSW and Victoria, the introduction of third party access regimes in all the States and Territories based on nationally consistent principles.
- Reform should only proceed if it delivers superior outcomes for customers and the environment and where the marginal social benefits exceed marginal social costs.
- Reform of local government utilities. A 'one size fits all' approach is not appropriate for the urban water industry. Solutions for large vertically integrated utilities will be different from reforms required in local government utilities.

3. Water management and planning

This chapter focuses on WSAA's response to the Productivity Commission's (PC's) questions on the following issues:

- supply augmentation and decision making
- utilisation and operation of sources of supply
- water treatment, transport and distribution; wastewater services
- integrated water management.

Context

In recent years, Australia's urban water sector has identified a need for substantial new investment in new water sources. The combined program of expenditures across WSAA's 30 members is estimated at approximately $30 billion from the period 2005-06 to 2011-12.[1] It is important to recognise the context for these investment decisions.

The industry has responded to a rapidly changing demand and supply environment, mobilising significant investment in reliable and high quality water sources at a time of significant resource constraints both within the industry and across the economy more broadly. This has been achieved without compromising service delivery or standards.

In response to the uncertainties created by climate change and rapid population growth all major cities in Australia now have strategies which outline the measures to be undertaken to ensure security of water supply and the adequate provision of wastewater services. A consistent theme in these strategies is the need to meet the challenges of climate change by adopting sustainable solutions. Because Australian communities have great interest in water, community consultation during the preparation of water resource strategies is critical. This will ensure that all interested individuals have the opportunity to input into the decision-making process.

Future strategies will still need to consider the implications of a changing climate in which cities can expect hotter summers, drier harvesting seasons and more intense storms as well as growing urban populations. In response, cities need to build the capacity to meet these extra water demands whilst developing a capacity to resist or recover quickly from the impact of rapid changes in climate, (the quality of resilience). To be resilient in this sense will require water sensitive planning and design.
'Water sensitive cities' will also provide many of the preconditions for more "liveable" cities – cities that are ecologically healthy; are greener (leading to better outdoor lifestyle opportunities); are physically cooler because of reduced urban heat island effects; are less energy and resource intensive; and ultimately more economically prosperous.

To do this the water sector will employ resource management strategies that are diverse and fully integrated with broader city planning objectives. A water sensitive city will be planned and designed with a view to maximising the capture and use of rainwater that falls on the urban form, and treat all water in the total water cycle as a potentially valuable resource (even "wastewater"). These decentralised

[1] WSAA (2009), *Water Services Association of Australia: 2008-09 Report Card*, page 7. This expenditure does not include capital expenditure relating to wastewater and upgrades of the existing water supply system.

features will be combined with the more traditional centralised approaches to meet the city's water needs.

Managing a large and diverse capital program presents a number of challenges for the water industry, particularly during periods of elevated capital expenditure as has been recently experienced across much of Australia.

These challenges include:

- ensuring that an appropriate and sustainable level of investment is achieved, balancing finite capital funds and other resources and ensuring that highest priority projects are funded
- responding to the uncertainties created by climate change, which affects projections of future demand, the performance of climate dependent supply sources, and the costs of operating existing and developing new assets
- meeting current and changing regulatory requirements
- ensuring service standards are maintained
- accommodating population growth and volatility in customer demand for water and wastewater services
- providing confidence to Boards, shareholders and regulators in the development and delivery of capital programs
- maximising value to shareholders and the community and
- preparing the industry to operate in a carbon-constrained world.

A water sensitive city approach presents additional challenges. Recognising the growing desire for more sustainable and liveable cities, the water sector understands that conventional approaches to urban water planning do not address these challenges around sustainable cities. That is, the '*current state of play*' investments in water security are necessary but not sufficient *on their own* to address these new challenges. Transformational changes are therefore needed in urban water management to achieve cities of the sort envisaged by our national leaders.

The urban water sector acknowledges the importance of project prioritisation in a capital-intensive industry. Water businesses have made significant improvements in the sophistication of capital planning and delivery – encouraged in part by a regulatory imperative to pursue only 'prudent and efficient' projects – but the industry equally acknowledges the need to continue to explore avenues for improvement. Given its capital intensity, even small improvements in the way projects are identified, delivered and funded offers potentially significant efficiency opportunities.

WSAA is currently managing a project that aims to develop a common set of principles and guidelines to help its members improve the way capital programs are prioritised and managed, to meet current and future infrastructure needs. Common principles and guidelines will enable all WSAA members to establish robust and transparent prioritisation processes, drawing on shared knowledge and experience.

WSAA acknowledges the concerns voiced by some stakeholders regarding the high cost of recent and proposed investments. Water businesses deal daily with customers and understand precisely the impact of recent capital programs on water prices.

However, it is important to recognise that planning decisions in the urban water sector necessarily occur under conditions of uncertainty, both with respect to demand and supply. This uncertainty has magnified in recent years and is expected to continue to do so into the future reflecting the early impacts of climate change and an unprecedented decline in rainfall in many areas across the country. The pace and scale

of change experienced in some parts of the country were not anticipated by any stakeholders and the costs of responding to these changes does not illustrate a systemic failure in planning.

The political context in which Australian water businesses operate is another important factor and perhaps more than any other utility sector, governments have demonstrated a willingness to direct the water sector to pursue certain solutions. Desalination, for instance, offers a secure supply option independent of climate and rainfall and can generally be brought on-line more quickly than large scale surface water infrastructure. The insurance option desalination provides has clearly been a factor in Governments across all mainland States developing large-scale desalination projects as a component of water security plans for major metropolitan areas.

Governments in some jurisdictions have expressed a policy preference for or against particular forms of supply augmentation, examples of which include:

- previous support for a 'no dams' policy for servicing the Greater Sydney region
- opposition to reintroducing highly treated recycled water to dams and potable distribution systems
- political support for desalination plants in some jurisdictions
- constraints on urban-regional water trading.

A further issue is the emergence and growing importance of a range of different sources of water, such as desalinated, recycled and groundwater, in meeting the growth in overall demand. Each has different levels of reliability and cost and feasibility will vary from location to location.

Increasingly the urban water cycle is becoming more complex, particularly with the wide scale and rapid proliferation of various forms of water recycling. This identifies a generalisation that is evident across the broader community about what constitutes 'water supply'. Typically the community thinks of water supply as the linear dam to tap process of providing drinking water. However, water utilities are now planning and managing the blending of various grades of water for drinking. The actual sources that exist today in Australia for reticulated supplies include: surface supplies from protected catchments, unprotected surface supplies from rivers with multiple upstream users, desalinated water from brackish water and seawater, groundwater and in the future various forms of potable reuse.

The growing aspects of water supply are in the non-potable recycled water market and reference to the *Australian Guidelines for Water Recycling (Phase 1)* demonstrates the complexity of meeting public health and environmental regulations for a wide range of end-uses. It is important the PC recognises then that 'water supply' in the urban context can cover any value-added and safe (for humans and the environment) water product for the community and industry including drinking water through to recycled water for golf courses and food crops. The complexity of managing and operating these diverse systems is a unique factor for the utility sector.

Interdependencies between the various sources of water that comprise different urban water systems mean that the value of a new source is dependent on the characteristics of the existing sources. For example, water conservation measures reduce the volume of water consumed but also reduce the volume of water available for recycling.

Planning processes

Given these factors, the relevant questions are at what level should planning occur and to whom should planning responsibilities be granted?

Planning responsibilities currently differ significantly across jurisdictions, and institutional responsibilities for planning can be different even within a State. Water planning for metropolitan and regional NSW, for example, is managed by different agencies.

Planning also varies across the water cycle with stormwater, for instance, typically the domain of local governments which take a drainage or flood protection perspective. New approaches are needed if this and other non-traditional supplies are to be considered as a part of future water strategies.

It is possible that the process by which planning decisions are made is more important than who should do it, although the entity – whether it be water utility or government – must have superior knowledge and skills. In WSAA's view the most important considerations with respect to planning are:

- Objective assessment of all options to maintain a given level of service to customers, with the absence of any preference for (or discounting of) particular augmentation technologies or other options. This includes the removal of all policy bans. Water planning should aim to develop a portfolio of supply and demand management options that is best suited to the individual circumstances of the various urban and major regional centres.
- Consideration of a portfolio approach that diversifies supply sources and utilises urban planning opportunities to embed water conservation and the harvesting of non-traditional sources. Such an approach builds the resilience of the combined system.
- A focus on maximising the value to the community from water sector investment, achievable when investment in water infrastructure can generate flow-on social or environmental benefits such as reducing the discharge of waste water to the environment through the use of recycled water programs.
- Periodic reassessment of the basic assumptions underpinning planning processes including climate change and population growth. Customer, source and network performance standards should be frequently retested, to ensure that they remain appropriate given contemporary costs and the value offered to customers and other stakeholders.
- Recognition that water systems are unique. There are constraints on the movement of large volumes of water due to the high energy costs associated with transportation. This can limit the capacity for interstate and often intrastate trade. This means planning should be regionally based, not necessarily dictated by utility boundaries.
- Understanding of technological developments and their implications for the composition of water supply. For example, technological developments with respect to water treatment and recycling may reduce their costs over time and provide planners with greater choice when considering the need for and form of supply augmentation.
- Clear understanding of the expectations of and policy objectives for the urban water sector. This includes expected standards and their relative costs and benefits (with respect to water quality, for example). A key issue here is the poor definition of what is expected of water utilities in terms of sustainability outcomes. The physical linkages between urban water (and wastewater) systems and environmental outcomes are clear, but the definition of sustainability as an objective for utilities and the role of government and business in achieving 'sustainable' outcomes need clarity.
- An understanding of local customer service standards, and community expectations and requirements. It is not clear that these considerations would be effectively captured at either a national level or within government. Because Australian communities have great interest in water, community consultation during the preparation of water resource strategies is imperative to ensure all interested individuals have the opportunity to input into the decision making process.
- Decision-making processes should encourage timely decisions to allow optimal source development.
- Recognition of the full economic cost of energy (including carbon costs) in planning decisions. Water transportation and treatment is energy intensive and Sydney Water and SA Water, for instance, are the largest electricity customers in their states so future energy costs is critical to both efficient management of existing networks and planning for growth. Uncertainty regarding the timing, format and size of any future carbon cost is a significant issue for the water sector. Some

utilities have determined to include a proxy carbon price to inform future planning decisions – Water Corporation in Western Australia applies a $25/tonne carbon cost, for instance – but approaches are not consistent across all utilities.

- Planning needs to recognise both the cost of energy to water utilities and also potential energy supply options available to the water sector – notably from wastewater treatment processes but also from energy generation in gravity distribution systems.
- Frequent reassessment and further research in each capital city to test the validity of previous assumptions about demand, supply and any other factors relevant to water planning in light of the substantial uncertainty about the future (driven by climate change, for example).
- Appropriate pricing arrangements that provide for cost recovery of all potential sources of supply. This is considered in more detail in the next chapter.
- Recognising the benefits of collaboration with other sectors to identify opportunities for economies-of-scope through combined investment.

Water planning has improved significantly in the last decade. Options are now more robustly assessed, there is better community engagement, and planning decisions are more clearly able to be linked to tangible customer and environmental outcomes.

However, continued uncertainty in relation to future water demand, surface and groundwater source performance, and the complexity and cost of new investment options, means that water planners need to adopt appropriate tools to inform their planning decisions. Real options analysis and portfolio choice theory are amongst the possible mechanisms available for analysing supply augmentation. This work also needs to be informed by the various technical models such as distribution capability, scheme/source reliability modelling and Long Run Marginal Cost models.

Planning under uncertainty

WSAA has previously undertaken research to consider the application of real options analysis to the urban water sector. Urban water utilities typically use discounted cash flow analysis to evaluate financial viability of individual capital investment options and separately make assessment of relative risks.

Real options analysis – a specialised analytic tool for evaluating complex investments and an organisational process for guiding strategy – provides a superior mechanism for evaluating projects in uncertain conditions and is appropriate in situations where:

- the benefits of one project over others is uncertain
- information can be gathered in future that helps make better decisions
- there is flexibility in a project, in some of its components or in a portfolio of projects (for example, the ability to delay or to choose a staged or modular design)
- there are adjustment costs in reversing the project or its components.

A risk-adjusted, decision tree approach is appropriate in the urban resource planning context and involves four major steps:

- *Problem structuring* – identify and structure the key elements of the problem, including metrics, decisions and uncertainties
- *Baseline analysis* – develop a spreadsheet financial model of the problem, gather baseline information for the inputs to the model and evaluate alternatives using those inputs and the model
- *Uncertainty analysis* – gather information on the key uncertainties and use the financial model to evaluate the alternatives under uncertainty
- *Options analysis* – specify the important downstream options and use the financial model to evaluate the strategies with flexibility/optionality.

Source: WSAA (2008), Real Options and Urban Water Resource Planning, Occasional Paper No. 20

A practical example of this is ACTEW's real options analysis of three water security infrastructure projects. The analysis includes combinations of the projects against the do nothing option; probability of project success; reduction in cost of water restrictions attributed to the projects; and project capital and operating costs. Net economic benefit is calculated for the optimised investment portfolio for two climate scenarios.

Integrated planning

A differentiating feature of water planning is the benefit of integrating water planning with other planning decisions, particularly urban planning. The International Water Association's *Cities of the Future* (COTF) program, led by WSAA and Melbourne Water in Australia, seeks to explore the interrelationships between water and other urban/community sectors, such as transportation and energy use.[2] A key finding from this COTF research is the importance of greater integration of water planning with other types of planning:

- Fresh water is becoming increasingly scarce and there is a growing aspiration to reduce the ecological footprint of cities (i.e. to become more sustainable). It is a current hypothesis that doing so will affect the water use profile of the city by moderating demand for potable water and generating new sources from within the city itself. However, the water sector has historically had limited influence of decisions about the shape and density of cities and a superior approach would be to employ a strategy where delivery of all urban infrastructure and services are planned in a more coordinated way.
- Urban water managers need to collaborate with other professionals and the local community to redesign water management systems integral with other city services. This would deliver sustainable water services but at the same time to enhance quality of life both within and beyond the urban environment.
- Water authorities have, on occasion, found it difficult to influence urban planning policies or regulations because of current powers and governance arrangements. This should change and authorities should be involved at an early stage, drawing on social, economic and regulatory capabilities and collaborative influencing skills.
- Water planning should be integrated into decisions about land use and other forms of infrastructure, particularly if there are statutory requirements or obligations with respect to water use. This necessitates the involvement of local and state (and potentially federally through Infrastructure Australia) governments and the development industry in water planning, especially in context of new developments and urban growth corridors.

With increasing density of development in cities and increases in capital city land values there is pressure to allow development within 'odour buffer zones' around wastewater treatment plants. Investment in odour control could allow valuable land to be brought into production, or improve the amenity of surrounding community, thereby (potentially) generating a net benefit to the community. However, the immediate effect of such investments would be to increase costs for water businesses and prices for consumers. A more integrated approach allows for a more holistic approach to considering issues of this kind. It would also be necessary to be more flexible regulatory arrangements for odour management.

---

2 IWA Cities of the Future Program, *Spatial Planning and Institutional Reform Discussion Paper for the World Water Congress*, September 2010

Australian urban water utilities have generally sought to include wider environmental and community considerations – oftentimes using a triple bottom line assessment approach – into their own planning, based on their individual corporate strategies. Examples include:

- The WA Water Corporation's pilot testing of a new sustainability evaluation tool called the Social Environment Tool (SET). SET has an objective to ensure a broad and consistent assessment (i.e. financial, social and environmental) of project options from a whole-of-state perspective. SET applies a cost-benefit analysis methodology where the traditional financial net present value (NPV) assessment is augmented with the monetisation of social and environmental costs and benefits (with appropriate sensitivity analysis). This enables multiple sustainability criteria to be weighted on a consistent basis when assessing options with different characteristics, with the sensitivity analysis showing when the assumed value becomes critical for decision making. The use of a single tool also improves consistency in what can be quite subjective assessments across different projects.
- Yarra Valley Water in Victoria undertakes a similar approach and takes account of the 'total community cost' of individual augmentations and developments.

These approaches seek to provide for a balanced assessment of options, and in doing so should improve the quality of planning outcomes. However, they require utilities to make judgements and trade-offs beyond the traditional assessment of the most cost-effective strategy for meeting a clearly defined customer service requirement. Where these trade-offs suggest a higher *financial* cost option is preferred, utilities are exposed to a risk that jurisdictional price regulators may not support these options as the most prudent and efficient strategy.

Responsibility for planning

The question of to whom planning responsibilities should be granted is also important. There is no definitive model or evidence from other industries or jurisdictions that is clearly preferable for the Australian urban water sector.

Across WSAA's member utilities, there are a range of different planning models in effect, with varying levels of institutional separation in planning responsibilities. Centralising and institutionally-separating water planning functions has been suggested by some stakeholders as a means of encouraging competition at the bulk supply level. Distancing planning from capital and service delivery is seen potentially as a means of facilitating new (private sector) entrants and also supports the independence of planning decisions.

WSAA believes that further research and analysis is required on the merits of alternative institutional models for water planning. Certainly, different planning and procurement models operate in other industries – gas and electricity, for example – and have been considered for the water sector in other jurisdictions (such as the UK).

WSAA has identified a number of key conditions that should apply and important factors for policymakers to take into account:

- Policymakers should have regard to the current industry structure, which ranges from vertically integrated entities through to private ownership of relatively small developments and bulk water sources – different industry structures might be more supportive of different (and improved) planning arrangements.
- An independent planning entity may be a more effective model when there are multiple sources with diverse ownership but less so when there is a vertically integrated entity.
- Accountability is vital so it is necessary to support any planning arrangement with appropriate institutional and governance arrangements. Efficient decision making cannot occur with fragmented institutional responsibilities across water, wastewater, recycled water, stormwater

service provision, and related functions of urban planning, land-use control and development charging.

- Institutions and governance arrangements should seek to avoid any conflicts of interest in planning decisions, such as a preference for a particular form of supply augmentation.

In general, WSAA holds the view that responsibility for planning for water security should reside with the entity with superior capacity for managing risk:

- While a centralised planning model at the national level has merit in other contexts (electricity and gas), centralised agencies – including a yet to be established independent national entity similar to the Australian Energy Market Operator, for example – may not have a sufficiently well developed knowledge of the urban water sector, particularly at a localised level where characteristics may vary substantially.
- The case for a national planning agency is also undermined by the absence of opportunities to promote interstate trade in water. As mentioned, transportation costs are significant so opportunities to promote trade exist within – including between the urban and regional sectors – rather than across jurisdictions.
- A preferable role for a national, centralised agency may be to collate and disseminate information and data to facilitate good planning decisions, an example of which may be in the form of a 'statement of opportunities', as exists in some other utility sectors.[3]
- Individual water agencies (either government or incumbent water utilities) might develop management plans in collaboration with partners at an individual catchment or precinct level. This would ensure some awareness of local issues (e.g. planning) and requirements.
- Individual stakeholders (e.g. developers, local governments, customers) should have the capacity to influence their own outcomes. For example, the management of a utility's own water security through localised stormwater harvesting.

It is common in some jurisdictions for local governments to assume responsibility for water planning decisions, particularly outside of densely populated, urban areas. Increasingly, these arrangements are recognised as contributing to deficiencies in planning and service delivery that could be addressed through alternative structural arrangements; these issues are considered in more detail in a later chapter.

Perhaps the greatest opportunities for efficiency gains in water planning will flow from greater clarity from governments and policymakers in terms of targets, standards, regulation and licensing. There are some areas where the expectations for the urban water sector are unclear, which can diminish accountability for decisions and impose coordination costs. This can translate into unnecessary investments or the inefficient operation of water systems. More specifically, some capital and operating costs that are driven by sustainability-linked strategies may not be efficient from a whole of economy perspective.

In terms of system operation, the efficient optimal management of existing assets is important from the perspective of allocative and dynamic efficiency. This is likely a function of the efficiency and effectiveness of regulatory and water pricing arrangements – including the absence of subsidies to specific water sources – and is considered in more detail in the next chapter. Over the longer term, efficient operation can defer, reduce or avoid future capital expenditure.

---

[3] For example, the Australian Energy Market Operator publishes an annual Statement of Opportunities for the National Electricity Market, which includes energy and maximum demand forecasts for each region for the next ten years, NEM generation capacities and an overview of the investment environment.

As with planning, the merits of an independent system operator are unclear and will likely depend on current industry structures and the composition of existing sources supply.

Key conclusions and recommendations

- The continuing development of a diverse portfolio of water supply options to mitigate climate change risks and maximise community value by contributing to cities that are sustainable, liveable and prosperous.
- Community and stakeholder consultation during the preparation of water resource strategies.
- The removal of policy bans sometimes imposed by State Governments to rural- urban water trading and indirect potable re-use. It is essential that all water supply/demand options are thoroughly evaluated according to their merits.
- Significant opportunities for efficiency gains in water planning are likely to flow from greater clarity from governments and policymakers in terms of targets, standards, regulation and licensing as compliance with these is a key driver of capital and operating expenditure.
- Many of the reforms now accepted for the major metropolitan areas – independent regulation, commercial management of utilities – are absent in some regional areas. This has created problems such as a lack of effective regulatory incentives and sanctions, an absence of functional separation, a lack of capital, commercial focus, skills and technology.
- Where Governments assume responsibility for urban water planning, they must be adequately resourced with skilled staff to remove the information asymmetry that currently exists between utilities and government policy and resource management agencies.
- The International Water Association's (led by WSAA and Melbourne Water in Australia) *Cites of the Future* program recognises that water and its interactions with other urban sectors – particularly urban planning – is a central focus in the development of sustainable cities. These linkages need to be incorporated in water planning arrangements.
- Planning frameworks should make it clear who is ultimately responsible for the planning of water and wastewater systems, ensuring accountability for decisions.
- There are a variety of institutional forms in place across the urban water sector that impact on the efficacy of different planning frameworks. Concepts of institutionally separated independent planning authorities may have more relevance where there already are multiple utility agencies involved in the supply chain.

4. Water pricing and consumption

This chapter focuses on WSAA's response to the PC's questions on the following issues:

- efficiency of water pricing
- demand for water
- elasticity of demand
- equity
- non-price demand management.

Efficiency of water pricing

Appropriate pricing of water is necessary to encourage efficient water use and send appropriate signals about scarcity and future supply augmentation. Setting prices at a level that under recovers costs or granting subsidies to a particular source of supply may encourage overconsumption and necessitate costly investment in future capacity and supply augmentation.

Certainly, efficient pricing which supports cost recovery is equally important for wastewater services as wastewater typically accounts for more than half of the urban water sector's cost base.

Various forms of capital and operating subsidies continue to be applied in the water sector and impact on the realisation of efficient pricing outcomes. In southeast Queensland, for instance, the Queensland Government determined to apply a lower rate of return on certain 'drought-response' assets, accompanied by a ten year phase in for full cost recovery at the bulk level. The incentive for newly formed distributor-retailer authorities to consider local wastewater recycling and potable substitution options is reduced under such pricing arrangements; such projects are not financially attractive even though they might be economic from a broader, whole of grid perspective in the absence of such subsidies. Similar biases exist in other States and Territories, wherever full cost recovery is not properly featured in utility pricing strategies.

The decision to set water prices at a level that does not allow for the recovery of efficient costs – including a return on capital – is largely attributed to the absence of independent economic regulation.[4] Where independent prices regulation is in place, generally pricing decisions are more robust, and more conducive to supporting future investment and encouraging appropriate consumption by customers.

Demand for water

Water is undoubtedly a normal economic good, in that the quantity demanded declines as the price of water increases, but the shape of the demand curve, how demand differs amongst different customer groups and the interaction of price and non-price demand management initiatives is not fully understood.

[4] The NWI pricing principles should form the basis for setting water prices/ charges in all instances. Four sets of principles have been drafted to assist jurisdictions move towards consistent approaches to pricing, as required by the National Water Initiative. The pricing principles are for a) recovering capital expenditure b) setting urban water tariffs c) recovering costs of water planning and management and d) recycled and stormwater reuse.

The demand for water (responsiveness to price and need for supply security, for example) will differ substantially across and within customers groups. Different consumption behaviours can be observed between:

- indoor versus outdoor use applications
- high versus low income consumers
- industrial and commercial versus residential customers, and within residential customer groupings based on dwelling density and form.

Demand patterns also have changed over time, influenced by customer education and sophistication, the rate of adoption of more water-efficient appliances, housing type and lifestyle changes.

Clearly, some consumers are less willing or able to reduce their water usage in the short term more than others, irrespective of price. Examples include organisations which have invested in commercial processes that use large volumes of water or residential users who have invested in gardens and landscaping.

Another issue is the extent of demand for water of different qualities, which will be a factor for industrial and commercial consumers. However, the size of this market is constrained by the need to transport water of different qualities through separate distribution networks. Overall, demand for non-potable water is unlikely to be significant in many urban networks and then only for industrial processes or new developments at a localised level.

Some water businesses – notably the Gladstone Area Water Board in Queensland – supply industrial customers via a dedicated raw water distribution network, separate from any potable treated supply system. Such examples are generally at a localised and highly disaggregated level and are not generally representative of the supply networks that exist in most urban and metropolitan areas.

While analysis and research is continuing, the identification of the drivers of water demand (including own-price elasticity) has been compromised by the application of water restrictions and other recent measures to manage demand (i.e. non price mechanisms). Water demand has been artificially suppressed by restrictions, but with the easing of restrictions has not increased to previously-observed levels.

Significant step changes in consumption behaviours means that previously observed relationships – price elasticity – are now untested and unreliable. More research on the characteristics of the demand for water (including different types of water quality) is essential. WSAA is aware that Sydney Water and others are undertaking further research on this matter and ACTEW/AGL is updating its previous 'willingness to pay' analysis. This research will be an important contribution to the PC's inquiry as it progresses.

Household consumption patterns reflect the lasting impacts of water efficiency measures and demand initiatives such as water restrictions. This is illustrated in the following table.

Table 1: Average annual residential water supplied (kL/property)

WSAA member	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Sydney Water	224	211	203	199	182	198
Water Corporation	265	277	268	281	268	277
Yarra Valley Water	204	193	198	178	157	151
South East Water	186	184	187	167	152	143
SA Water	245	235	233	235	194	190

WSAA member	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Brisbane Water	258	264	185	153	128	133
City West Water	188	187	183	163	149	146
Gold Coast Water	198	244	200	183	149	166
Hunter Water Corporation	208	197	205	195	177	180
ACTEW	248	240	261	240	195	201
Barwon Water	218	206	216	169	156	156

Source: 2008-09 National Performance Report

One consequence of the fall in consumption has been a relatively small increase in total water bills in some jurisdictions, despite higher regulated prices over that period. Changes in the average nominal residential water bill over the period from 2003-04 to 2008-09 were as follows:

- approximately 10 per cent increase in Melbourne
- six per cent increase in Perth
- one per cent increase in Brisbane
- three per cent fall in Adelaide.

However, the permanence of any change in the profile of demand is unknown and as such, forecasting based on historic trends and observed outcomes is problematic.

Previous WSAA analysis of the overall demand for water and likely drivers of demand into the future identified the following as key determinants:

- population and economic growth
- climate change and the predicted increased frequency of days above 30 degrees celsius
- design of cities of the future
- housing type and density, particularly as outdoor water consumption is estimated to account for nearly 50 per cent of household demand in some Australian capital cities
- installation of water efficient appliances
- water restrictions and permanent water saving measures
- increasing cost of water
- changing demographics.[5]

Although the individual contributory effect of these factors potentially has changed, each is still likely to be relevant considerations in seeking to reliably forecast future water demand.

[5] WSAA (2010), *Implications of Population Growth in Australia on Urban Water Resources, Occasional Paper No. 25*

Scarcity pricing

Scarcity pricing has been proposed by various commentators as a mechanism for managing the aggregate level of water demand, to maintain a balance between supply/demand in urban systems.

Various different scarcity pricing approaches have been suggested. These include market-driven scarcity pricing (where prices are determined by trade in bulk entitlements and/or storage capacity shares) and administered scarcity pricing (where prices are coupled inversely to some type of storage index).[6]

In its simplest form, scarcity pricing would involve increasing customer-level prices to the point sufficient to reduce demand to available supply, with corresponding reductions in charges during period of relative supply abundance.

Water pricing remains a highly emotive community topic, evidenced by the reaction to significant price changes in Townsville, for instance. Community understanding of water prices as a mechanism to manage demand is certainly less than for other utility services. This is despite water representing a small proportion of total household expenditure.

WSAA recognises that pricing is necessarily part of an efficient and effective overall strategy for managing water usage, and clearly moves to consumption-based pricing have been significant in reinforcing to customers the 'value' of water services. But at this point there is little basis on which to develop an appropriate pricing structure that, of itself, would ration demand in the short term and also send the necessary signals about supply augmentation. A lack of clarity around the rationale, purpose and duration of elevated prices will send confusing messages to planning entities and parties considering entry; high prices of unknown duration will not encourage entry into the bulk water sector, and demand responses may be so low as to require unfeasibly large price increases to achieve any required demand curtailment.

Other current considerations that may undermine the effectiveness of a scarcity pricing approach include:

- absence of intelligent networks (i.e. smart meters)
- infrequency of billing cycles
- some proportion of direct customers not receiving water bills (such as tenants)
- a consumption component that does not comprise entire bill
- water bills accounting for a small proportion of total household expenditure.

Flexibility in tariff structures

WSAA sees scope and substantial benefits from the provision of greater flexibility for water businesses in terms of regulated tariff structures. This would allow utilities to negotiate with their customers and offer products – relating to price and level of service across multiple dimensions of quality – that are better suited to different customer's needs and individual circumstances, thereby better facilitating efficient water use.

---

[6] A 2008 ABARE report, *Urban Water Management: Optimal Price and Investment Policy under Climate Variability*, suggested that prices could vary in line with dam storage levels, in a similar manner to current triggers for water restrictions.

This could also extend to the pricing of wastewater; a large industrial customer, for example, could reduce its water bills by investing in measures to reduce the volume of wastewater and trade waste it produces or the need for treatment of that water, rather than the water business recovering costs through water bills. Greater flexibility is likely to lead to more efficient outcomes at the industrial and commercial, rather than residential level.

Overly prescriptive or restrictive pricing structures can inhibit this. For example, IPART's price determination for Sydney Water provides little scope for Sydney Water to negotiate with its larger commercial customers, or indeed derive more tailored pricing for certain groups of residential users. A better pricing model would focus more on the appropriate level of cost recovery overall from a basket of services, rather than a highly prescriptive tariff structure.

Continued pricing reform is likely to be an important mechanism for encouraging efficiencies in water use, but it is not a silver bullet. Pricing needs to be accompanied by other complementary strategies – customer education, further progress in meter technology and billing arrangements, in particular.

There are some limitations in current technology and institutional arrangements which present as significant impediments to future tariff reforms. Water meters for most businesses are manually read, for instance, billing is therefore infrequent, relative to other utility services, and price signals to customers are delayed. Similarly, water bills in some instances are sent to property owners rather than occupiers, so there can be a substantial proportion of the customer base that does not receive a direct consumption-related price signal.

The urban water sector is working to remedy a number of these problems and it is likely they will be addressed in the near-to-medium term. The next generation of water meter technology will incorporate various smart features, even though it is currently uneconomic to replace existing meter fleets with smart meters simply for customer-level pricing and demand reduction outcomes, given the existing uncertainty about customer behaviours and price responsiveness.

Intelligent networks and smart metering

The existing water and wastewater networks are designed only to operate in pre-set mode. 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.

The Victorian Water Industry Association has now established a Strategy Group to focus industry effort on intelligent networks, with an aim to identify key current and emerging opportunities. WSAA has been engaged in preparing for the advent of smart metering and its possible application in the urban water industry in Australia.

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.

Sydney Water in conjunction with Energy Australia is now trialling smart meters in 1,000 homes in Sydney, Water Corporation are undertaking a residential trial of 13,000 connected properties across Western Australia. ACTEW/AGL 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. WSAA will ensure that lessons learnt and the knowledge generated from these trials is shared throughout the industry.

Smart meters are also able to detect leakages both in the utility managed part of the water supply system and within the households.

For example, 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.

Intelligent networks and smart metering

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.

Source: Extract from 2009-10 WSAA Report Card

Non price demand management

Water restrictions have been shown to be demonstrably effective at changing customers' water use behaviours. Experience from Melbourne, Sydney and Brisbane, in particular, is that end-use restrictions were able to significantly lower per capita consumption, prolonging the reliability of existing supply sources during periods of extended drought.

However, user restrictions are an inefficient, costly and blunt instrument. They tend to focus on certain use types – for instance, residential garden watering or car washing – which are visible and therefore are more readily able to be policed. Other significant water-using behaviours are less able to be modified by restrictions alone.

More importantly, many restrictions impose a significant cost on customers and the community – examples include customer inconvenience, degradation of sporting facilities, creation of a bias for high-cost self supply options such as rainwater tanks – and therefore, are not in WSAA's view an appropriate permanent or long term solution.

The existence of permanent water restrictions provides little flexibility if industry enters a severe dry period. As such, they should be viewed as one of a number of tools available to manage the demand for water, role than the sole mechanism. However, WSAA reiterates its support for less restrictive, conservation programs that encourage efficient water use.[7]

Key conclusions and recommendations

- Achieving full cost recovery in water and wastewater pricing in cities and regional areas must be a continued focus for Governments. Despite widespread agreement to the principles of full cost recovery, the practical application of this is lacking, particularly in regional areas but also in some metropolitan centres.
- Likewise, adoption by all water service providers of the COAG Water Planning Principles needs continued attention.
- WSAA is cautious of the merits of scarcity pricing as a tool to reduce demand. Additional work needs to be undertaken in relation to the effectiveness of scarcity pricing in managing demand and encouraging new supply augmentation, and customer level impacts also need to be understood.
- There are some limitations in current technology (metering, in particular) and institutional arrangements which present as significant impediments to future tariff reforms.
- Water restrictions are an inefficient, blunt instrument and impose a significant cost on the community.

[7] WSAA (2010), op. cit., page 3.

5. Regulation of the urban water sector

This chapter focuses on WSAA's response to the PC's questions on the following issues:

- economic regulation
- other forms of regulation.

In general, WSAA believes that all forms of regulatory administration that apply to the urban water sector – economic, public health and safety, and environmental most notably – should have regard to principles of good regulatory practice and should have the following characteristics, namely:

- directly targeted at the problem or market failure they are intended to address
- proportionate to the issue they are intending to address rather than imposing a significant compliance burden or a severe penalty regime
- transparent and accountable, in that the rationale for regulatory parameters and decisions – including enforcement activities – should be clear and subject to scrutiny. This also includes the need for continuous evaluation to determine whether regulations are achieving policy objectives in an efficient and effective manner
- fair, in that regulations should be applied equitably, consistently and in a non-discriminatory manner
- consultative, to ensure regulators understand the impact of their decisions on regulated businesses and the community.

Economic regulation

WSAA supports independent economic regulation and the continued removal of (actual or perceived) political interference in pricing, particularly as prices are projected to rise to cover the costs of developing a diverse portfolio of water supply sources to mitigate climate risks.

Recent regulatory price paths to 2011-12 and 2012-13 suggest typical residential bills will increase significantly in the coming years if current consumption levels are maintained or increase. Price increases are not a result of regulation. Rather, independent prices regulation provides customers with a level of assurance that regulator-approved price increases are 'appropriate', whilst benefiting businesses by allowing sometimes complex and contentious pricing issues to be debated in an expert and objective forum.

Table 2: Regulated price paths, 2008-09 to 2012-13

Utility	Period of increase	Real average annual bill increase
Sydney Water	2006-09 to 2011-12	7.7%
Gosford	2009-10 to 2012-13	3.5%
Wyong	2009-10 to 2012-13	2.7%
Hunter Water	2009-10 to 2012-13	6.9%
ACTEW water ACTEW sewerage	2009-10 to 2012-13	1.0% 4.8%
City West Water	2009-10 to 2012-13	10.9%
South East Water	2009-10 to 2012-13	12.1%
Yarra Valley Water	2009-10 to 2012-13	13.2%
Barwon Water	2008-09 to 2012-13	7.5%
Central Highlands Water	2008-09 to 2012-13	6.7%
Coliban Water	2008-09 to 2012-13	9.7%
East Gippsland Water	2008-09 to 2012-13	8.3%
Gippsland Water	2008-09 to 2012-13	11.4%
Gaul bum Valley Water	2008-09 to 2012-13	7.4%
GWM Water	2008-09 to 2012-13	5.9%
Lower Murray Water	2008-09 to 2012-13	4.1%
North East Water	2008-09 to 2012-13	8.2%
South Gippsland Water	2008-09 to 2012-13	3.1%
Wannon Water	2008-09 to 2012-13	8.5%
Western Water	2008-09 to 2012-13	6.3%
Western part Water	2008-09 to 2012-13	3.9%

Source: 2008-09 National Performance Report

WSAA believes that independent economic regulation should be extended to capture water pricing outside capital cities. There are large areas of NSW and Queensland, for example, where prices are not regulated in this manner and operate under a different framework – and independent regulation should continue to be developed in those major metropolitan areas where regulatory arrangements are not yet fully formed. [8]

Clearly, however, regulatory frameworks and their application need to be mindful of the particular institutional arrangements in non-metropolitan areas. Heavy handed price regulation, with its attendant information and resourcing requirements, would impose a significant burden on many regional urban water businesses. More light-handed regulatory models – which require less information, less-frequent pricing reviews and fewer utility resources to manage – would be less costly to implement and

[8] For example, IPART has developed price guidelines for local utilities that are administered and monitored routinely across local government water providers by the NSW Office of Water.

administer but still offer benefits in improving the discipline on regional urban water businesses to pursue efficient operating and capital strategies, and to reflect the costs of these in efficient pricing policies.

WSAA's support for expanded regulatory coverage is subject to the adequacy and capabilities of regulators' resourcing, the clarity of their objectives and the cost to business of complying with the regulatory process.

While economic regulators across the country have generally discharged their functions effectively, there is merit in restating the commitment of all jurisdictions to the concept of independent economic regulation. There are examples of inconsistencies in the application of regulation and adherence to agreed principles, despite COAG commitments to implement consumption based pricing, full cost recovery and the transparency of cross subsidies. This is illustrated in the following case study.

Townsville City Council water pricing

Townsville City Council (TCC) operates a water business which services a population of around 185,000 people. In July this year TCC introduced a new structure for water charges. TCC discontinued the previously 'optional' two-part tariff and 'standard' allowance-based charging structure, introducing a uniform two-part tariff for all customers. The new charge comprised a fixed component of $454 per annum and a volumetric charge of $0.65 per kilolitre.

The change in water prices triggered significant community opposition. There were vocal and angry community forums, with accusations of 'price gouging' levelled at TCC.

TCC, in response, highlighted that, in its view, the shift to a two-part tariff was needed to comply with State and Commonwealth Government requirements for 'best practice' water pricing.

In return, the State Government has sought to distance itself from the dispute. The State has argued that none of its policies or legislative requirements oblige TCC to introduce a two-part tariff. The State has further advised Council that its only obligation was to introduce consumption-based pricing, a requirement the State now maintains had been satisfied with Council's previous optional two part tariff and standard allowance-based approach.

In WSAA's view this situation demonstrates the continuing gap between generally-accepted utility pricing principles, agreed to and codified in various National and State policy frameworks, and the scope for politically-influenced interpretation of these requirements at the local level.

WSAA does not consider that an allowance-based water charging structure meets any reasonable interpretation of consumption-based pricing. Indeed, the most recent interpretation by the Queensland Government would seem at odds with its own requirements imposed on TCC in 2008 for eligibility for State capital subsidies; at that time the State advised TCC that to be eligible it must agree to "implement best-practice water pricing, including consumption-based pricing for water, to achieve reasonable usage charges".

Governments can of course legitimately continue to manage community concerns about affordability of water services, especially for vulnerable customer groups. The debate in Townsville has however confused issues of full cost recovery, dividends to water business owners, and the structure of water tariffs and related distributional impacts on customers. These issues are best addressed by expert, independent economic regulators.

The concept of single national economic regulator for the urban water sector, similar to the Australian Energy Regulator, for example – is interesting, but requires further examination as to its costs and benefits.

The various State-based regulators may have greater appreciation of the characteristics of water service delivery in their respective jurisdictions and the customer profile. This in turn, may mean they are better placed to assess the relative merits of more flexible tariff structure (for larger industrial users and other large water consumers, for example).

However, a single and national regulator – and nationally consistent principles to guide economic regulation – could provide for the following:

- standardised approach to economic regulation across all jurisdictions
- access to precedents and information from other industries
- superior ability to attract and retain staff with sufficient expertise and experience to administer economic regulation.

A further issue of note is the impost on the urban water sector associated with the maintenance of the regulatory function – and the contribution to the ongoing operation of economic regulators – and the commensurate administrative and compliance costs associated with the price determination process.

WSAA is aware, for example that the three bulk water agencies in Queensland, excluding the Water Grid Manager, collectively paid $22m million to fund the Queensland Water Commission (QWC) in 2010-11. This contribution related partly to QWC's planning functions and partly to its regulatory functions. Furthermore, south east Queensland water agencies (including grid, bulk and retail businesses) have also paid approximately $600,000 each for 2010-11 the fund the Queensland Competition Authority and this cost will escalate by over 5 per cent per annum over the next couple of years.

An example of the administrative burden on water businesses was identified by Hunter Water in its contribution to IPART's investigation into regulatory burden in NSW. Hunter Water identified 32 separate regulatory reporting requirements – some monthly, other quarterly or annual – and noted that most required extensive preparation, data management and compilation.[9]

Other forms of regulation

The relative performance of other regulators with responsibilities that relate to the urban water sector is mixed. Environmental regulation is problematic in most jurisdictions with water businesses frequently encountering:

- little regard to impact on water sector in environmental standards and regulations
- limited evidence of scientific basis for decisions
- failure to effectively consult with the water sector
- failure to quantify the community's willingness to pay for certain environmental outcomes
- excessive focus on inputs and prescription (rather than outputs)
- duplication and inconsistency between Commonwealth and State regulations
- some examples of seemingly contradictory regulations, such as a requirements to increase water treatment that then contributes to increased carbon emissions
- focus on point source discharges when the optimal approach might be to deal with diffuse sources.

[9] Independent Pricing and Regulatory Tribunal (2006), *Investigation into the burden of regulation in NSW and improving regulatory efficiency: Final Report*

Furthermore, environmental regulation also incorporates standards for the treatment (i.e. use of chemicals) or release of polluted water resulting from industrial processes or sewage water. The impact of environmental standards is illustrated in the following case studies.

WSAA's position is that any new entrant to the water supply market (particularly where human consumption or contact is involved) must be held to the same strict but effective public health regulations and requirements that existing water utilities have been working to over at least the past 2 decades. WSAA members take pride in the drinking water compliance statistics (99 per cent for all major capital cities in 2008-09) and the continual improvement of risk assessment, management and prevention procedures developed to ensure robust public health protection in drinking water and recycled water systems.

Regulation of wastewater overflows

In 1998, the Environmental Impact Statement for Licensing Sewerage Overflows outlined long-term targets for dry and wet weather overflows and a program of works to achieve overflow reduction. Wet weather overflows were found to adversely impact the suitability of recreational waters for swimming and visual amenity.

At the time, the program cost was estimated at around $2 billion with a long-term timeframe of 2021, and estimated progress at about $100 million per year. It identified up to $1.6 billion to reduce the impact of wet weather overflows. This was thought to be affordable provided price increases were approved by IPART.

Since 1998, Sydney Water has invested approximately $1.3 billion in dry and wet weather overflow reduction. The 2010 cost estimates for achieving the long-term targets across all systems range from $4 to $6.5 billion. This excludes works completed or scheduled to 2015 and no deterioration works.

There have been significant improvements in beach water quality. The latest ratings for recreational uses for all but one beach are 'good' or 'very good'.

Community expectations have also changed in the last 10 to 12 years. There are significant challenges in delivering wet weather overflow abatement solutions in urbanised environments. Land availability is restricted and community acceptance of major infrastructure projects, where benefits may be marginal is low. Sydney Water's experience is that this has significant impacts on the costs and timeframes for project planning, environmental and planning approvals and the delivery of works.

Source: Sydney Water

Regulation of nutrients in a river catchment with significant population growth

In Western Sydney treated effluent is discharged into the creeks and streams of the Hawkesbury Nepean River catchment. Due to the greater environmental and health sensitivities, this wastewater is highly treated to tertiary level with additional nutrient removal.

By 2031 over 830,000 more people will be living in the Hawkesbury Nepean catchment (Department of Planning estimates). To service the significant population growth new and existing wastewater and water recycling plants in the Hawkesbury-Nepean will need to have the capacity to deal with major increases in the volume of wastewater received.

The cost of providing wastewater services for population growth depends greatly on the need to preserve the environmental health of the Hawkesbury-Nepean River.

Sydney Water has undertaken preliminary analysis on a range of wastewater treatment options from advanced to reverse osmosis (reverse osmosis is the treatment process used in desalination). The preliminary analysis also examined a range of discharge points from local creeks that flow to the Hawkesbury-Nepean, the main stem of the Hawkesbury-Nepean and out of the catchment entirely to the coast. The analysis shows a difference of a cost range for the various options between $570 million and $1.2 billion. Sydney Water is now working with its environmental and pricing regulators to identify the environmental and social benefits of the various options.

Source: Sydney Water

The absence of effective regulatory frameworks for environmental issues, including the pricing of externalities, undermines the quality of information required for water planning and investment.

In terms of possible reforms, Yarra Valley Water's submission to the Victorian Competition and Efficiency Commission's inquiry into environmental regulation in Victoria contained a series of important recommendations, which if enacted, would likely generate substantial benefits for the urban water sector. These recommendations include:

- Changes to environmental policy and regulations should always be subject to independent impact assessment that seeks to quantify the cost of regulatory proposals and the expected community benefits.
- Changes to environmental standards and targets should be based on well researched and justified scientific evidence.
- Environmental regulators should be adequately resourced to undertake scientific research and policy development.
- Environmental regulators should consider the merits of offsets or opportunities to trade in environmental entitlements. Furthermore, environmental regulation should focus on outputs rather than inputs as a performance based approach can achieve improved outcomes at a lower community cost than prescriptive regulations.
- Changes in environmental regulations should be coordinated with regulatory price determinations as far as possible to allow for the scrutiny and approval of any additional expenditure resulting from environmental standards.
- Standardisation of reporting requirements and improved coordination across different government agencies to reduce the burden of regulated businesses.
- Holistic assessment of businesses in terms of their ecological footprint rather than isolated impacts, such as point source discharges. This could be achieved through a regulatory mechanism such as a corporate licence.

In contrast, Australia has been at the forefront of developing risk-based drinking water guidelines that have prevented the outbreak of major health incidents, without imposing an excessive compliance burden on the urban water sector. This approach represents a model that could be adopted by other regulators.

Decisions are typically based on evidence and lead to national guidelines – rather than standards – developed with a national perspective. Importantly, such decisions are made following extensive consultation through the National Health and Medical Research Council's Water Quality Advisory Committee).

The likely increased reliance on 'non conventional' sources of supply – recycled water and greywater, for example – highlights the importance of ensuring a clarity of regulatory requirements and a collaborative approach to developing the necessary guidelines for water use, including personal consumption.

Key conclusions and recommendations

- Independent economic regulation and the removal of political interference in pricing water services should continue to be pursued.
- The PC's inquiry could usefully examine the merits of a single national economic regulator for water services. If this is not possible then mechanisms should be explored to ensure State and Territory regulators adopt and consistently apply national principles.
- Streamlined environmental, public health and economic regulation frameworks are needed to remove the duplication between the States and Territories and the Commonwealth.
- The likely increased reliance on 'non conventional' sources of supply and the adoption of an

Key conclusions and recommendations
integrated planning approach highlights the importance of ensuring clarity of regulatory requirements and a collaborative approach to developing the necessary guidelines for water use, including personal consumption. • Impact assessments of regulatory proposals that take account of full costs and benefits, having regard to the impact of environmental regulation on the urban water sector.

6. Industry structure and promotion of competition

This chapter focuses on WSAA's response to the PC's questions on the following issues:

- competition and contestability on Australia's urban water sector
- governance, institutional and structural arrangements.

Competition and contestability in Australia's urban water sector

The discussion of planning arrangements for urban water identified that the integration of geographically disparate water markets – as has occurred in the electricity sector, for example – may not generate benefits, largely due to the significant costs associated with transporting water over large distances.

Instead, the greatest opportunities for generating benefits through the promotion of competition are likely to be at the bulk water level within rather than across jurisdictions. This is likely to occur as a result of an increase in the number of sources of supply – recycled, wastewater, desalination, for example – and also from the expansion of opportunities for urban-regional trade.

However, the cost of water from sources other than existing dams (such as wastewater or desalination) is high so the benefits from greater competition may occur at a localised level and accrue to a relatively small number of consumers, at least at this time.

In WSAA's view, attention should first focus on ensuring the necessary arrangements are in place to facilitate the emergence of the alternative sources of supply:

- third party access arrangements
- efficient and appropriate economic regulation that ensures adequate cost recovery for all supply sources
- appropriate safeguards are in place to ensure that the safety of reticulated potable water is not compromised
- streamlined regulatory processes (including planning and processes and timeframe necessary to obtain approvals)
- objective planning processes for the augmentation of supply
- non discriminatory and transparent regulatory frameworks, including environmental (particularly in light of the relatively high consumption of energy by water utilities).

Opportunities currently exist albeit to varying degrees across jurisdictions. For example, legislative barriers to the emergence of additional sources of supply have been removed in NSW through the Water Industry Competition Act but there have been relatively few substantial developments. At this stage no licences have been issued for bulk supply but rather, only small and decentralised schemes (e.g. recycling project to service a single building or development). However, the number of suppliers is likely to increase over time and larger opportunities will emerge in line with technological change.

Irrespective of any initiatives to promote competition and contestability within the water sector, the primary objective of policymakers should be to ensure the continuity of water supply for any grade fit for purpose. This must include development of arrangements to provide for a supplier of last resort.

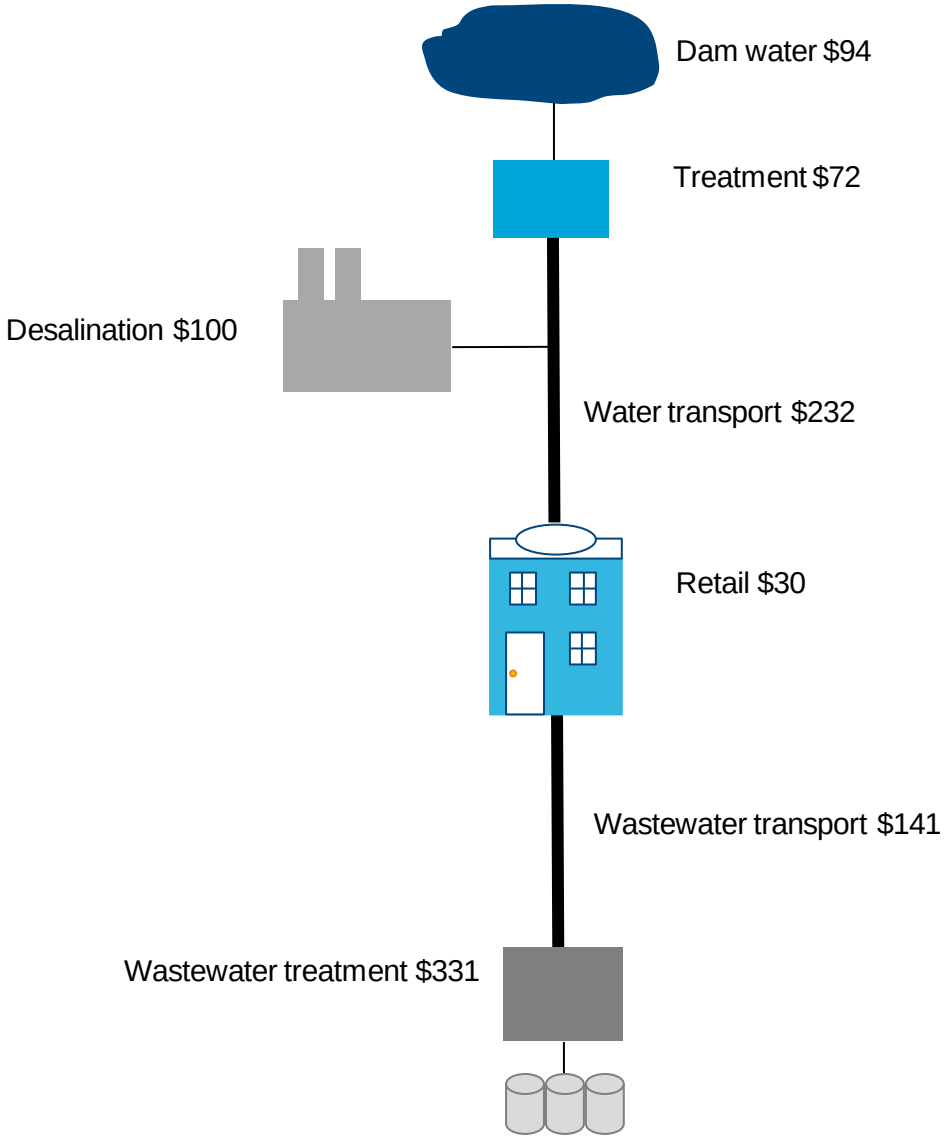
A further consideration is the technology of water delivery. It is well accepted that the largest and most costly component of the supply chain – transportation through transmission and distribution – is in most localities a natural monopoly. This means the proportion of potentially contestable costs within local

markets is, relative to some other utility sectors, smaller, meaning that opportunities for substantial benefits are limited.

Sydney Water has calculated the relative contribution of each segment of the supply to a typical water and wastewater bill, as depicted in the following diagram.

Chart 1: Estimated contribution of supply segments to typical bill

A typical $1000 water and wastewater bill comprises:



Source: Sydney Water. It should be noted that the relative contributions of dam water and desalination to a typical water and wastewater bill are influenced by the relative proportion of water supplied by these sources. The unit costs of these sources in some instances differ markedly.

The Sydney Water estimation of the contribution of each supply chain component to the cost of water also indicates that retail services are relatively small. Retail as a proportion of the total supply chain is generally estimated at less than five per cent.

This analysis of industry structure also highlights the importance of effective economic regulation of those natural monopoly elements in ensuring the overall efficiency of the delivery of water.

Retail competition

WSAA is of the view that benefits to consumers will flow from a more flexible, regulated pricing structure, as discussed above, and the facilitation of localised supply solutions rather than through structural and functional separation which has as its objective retail competition or contestability.

Forms of retail contestability for the water sector have been considered for some time, and in some overseas jurisdictions (notably Scotland) retail contestability has been adopted. There remains, however, little evidence from other industries or jurisdictions from which to draw definitive conclusions about the extent of benefits from facilitating retail competition in the urban water sector.

In the UK, there has been substantial recent contemplation of pro-competitive models for the urban water sector in England and Wales. Relevantly, the Final Report of the *Independent Review of Competition and Innovation in Water Markets* by Professor Martin Cave observed:

> *… the Review now believes that after an initial five megalitre threshold, there may be practical benefits from abolishing the retail threshold for non-household customers on the introduction of accompanying changes.*
>
> *… At this time, the case for extending competition to households remains weak. Ofwat, with support from stakeholders, should provide further assessments of the costs and benefits of these changes at the appropriate time as part of its duty to report to the UK and Welsh Assembly Governments on the development of water markets.*[10]

Water networks are relatively small, at least in comparison, with electricity and telecommunications networks, so scale economies can be lost through unbundling. Indeed, there may be scope of aggregation to regional-level entities where local governments are presently responsible for service delivery.

Some water utilities have also expressed concern over the potential for coordination costs or the diminution of responsibility for service delivery if distribution was separated from retail. Retailers would lose control over some elements of service delivery (in terms of metering or rectification in the event of a loss of supply). Furthermore, policymakers would need to provide for a supplier of last resort under retail competition.

Any perceived benefits in terms of billing (i.e. a single multi-utility bill) will be of little value to customers. Research suggests that customer satisfaction is more a function of the distribution element of service – water quality, pressure, reliability – and responsiveness to and rectification of any problems in this area, rather than billing. Furthermore, it was mentioned above that the retail component is a very small contributor to water cost structures – almost certainly less than five per cent – so there would be little material impact on prices.

Therefore, WSAA's preliminary expectation is that, presently, the costs of structural or functional separation – i.e. from the separation of distribution from retail – likely outweigh any benefits. WSAA believes however that the current Commission inquiry is a robust platform to retest this proposition and, if warranted, to develop evidence-based and customer-focused directions for further reform.

Irrespective of the structure of water businesses, it is notable that the industry has been active in seeking efficiency gains despite the nature of the urban water supply chain. A common strategy has been to pursue efficiency gains through the outsourcing and competitive tendering of certain activities and

---

[10] Professor Martin Cave (2009), *Independent Review of Competition and Innovation in Water Markets: Final Report,* page 12

projects where a utility can gain access to specialised skills and experience from diverse organisations, regions and conditions; economies of scale for operator companies, and other competitive benefits.

A study by Coelli and Walding for WSAA in 2005 found that the Melbourne distributor/retailers are highly efficient and opportunities for them to make significant improvements in standard water industry performance customer indicators (outputs) and associated expenditure (inputs) are limited. If the retailers were operating well below the frontier then the comparative competition regime would provide a strong incentive for companies to move to the frontier by either increasing key performance indicators at the same cost or maintaining them at reduced cost.[11]

One of the major contributors to these efficiency gains is the extensive outsourcing of operations by retailers to ensure efficient operation. For example, 58 percent of Yarra Valley Water's operating costs are outsourced and a further 33 percent of costs are benchmarked (refer figure below), while 98 per cent of capital expenditure (design and construction) is outsourced.

[11] Coelli, T and Walding, S, *The Performance Measurement of the Australian Water Supply Industry*, Centre for Efficiency and Productivity Analysis, Water Paper 01/2005, School of Economics, University of Queensland, 2005

Table 3: Proportion of total expenditure outsourced by WSAA member

WSAA member	2009-10: % Capital expenditure outsourced	2009-10: % Operating expenditure outsourced
Water Corporation	93	30
Sydney Water	94	72
Sydney Catchment Authority	99	64
Melbourne Water	100	73
South East Water	90	42
Yarra Valley Water	98	58 (with further 33% benchmarked)
Hunter Water Corporation	100	65
ACTEW	100 (28 to ACTEW/AGL, 72 to other alliances)	100 (outsourced to ACTEW/AGL)
SA Water	94	65

Source: Water utilities

Since 2000, WSAA has also been proactive in initiating and managing an international process benchmarking program spanning Civil Maintenance, Mechanical-Electrical Maintenance, Customer Services, Shared Services and Asset Management.

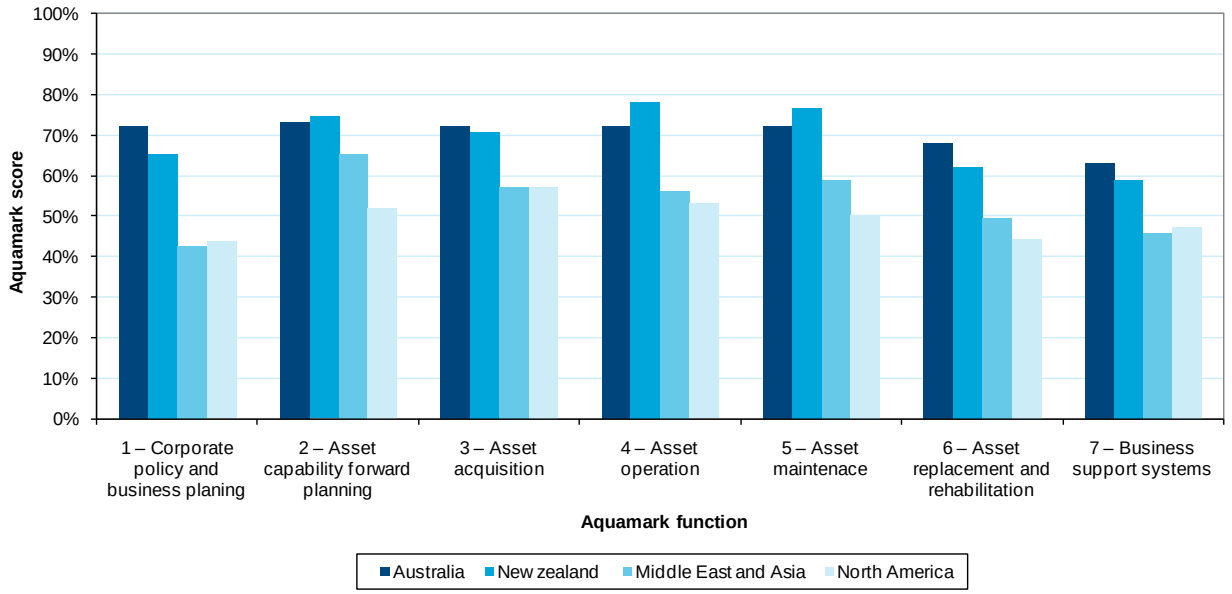
The 2008 Asset Management project incorporating 42 participants from Australia, New Zealand, Abu Dhabi, Sultanate of Oman, Canada, China and United States was co-sponsored by the International Water Association (IWA), and delivered through a consultant consortium led by GHD Pty Ltd and including Marchment Hill Consulting and CH2MHill. The project purpose was to raise the level of asset management practice in the global water industry through identifying process improvements and leading practices that can be shared across the industry.

Australia was identified as a world leader in Asset Management scoring at a 'mature' level of asset management practice, with the Middle East, Hong Kong and North America characterised as 'developing' and 'established'.

Corporations and State owned utilities (usually both) had significantly higher (15 to 20 per cent) median scores in all functions compared to their internal department and local government-owned (usually both) counterparts. This result is moderated by the regional results, where Australian utilities are predominantly State-owned corporations (13 out of 18) with generally higher scores than the median.[12]

[12] Water Services Association of Australia (2008), *The 2008 International Asset Management Process Benchmarking Project*

Chart 2: Regional performance of water utilities, IWA-WSAA Asset Management Process Benchmarking, 2008



Source: WSAA (2008), *The 2008 International Asset Management Process Benchmarking Project*

WSAA also notes the importance of comparisons of water business performance and the urban water sector actively promotes transparent reporting and arguably reports more information than any other industry worldwide.

In addition to urban water utilities satisfying State and Territory statutory reporting obligations, Commonwealth agencies also request data on a regular basis. For example, through the Water Act, the Bureau of Meteorology collects information from urban water utilities for Water Accounting purposes. The Australian Bureau of Statistics collects information for their Water Account, and through the National Water Initiative, the States and Territories and National Water Commission collect up to 130 performance indicators per urban water utility for the National Performance Report.

One caveat is the increasing reporting requirement of the urban sector and the duplication of data inputs by multiple sources. There is a considerable cost to water utilities associated with these data collection and reporting processes and opportunities exist to address duplication and overlap by developing synergies, streamlining reporting processes, and promoting greater cooperation between regulatory agencies and other entities with responsibilities that relate to the urban water sector.

Institutional arrangements

A final issue of note is the scope to improve outcomes in the water sector by implementing appropriate institutional and governance arrangements. The discussion of planning noted the importance of clarity of the objectives of those entities responsible for delivering water.

Institutional arrangements have been continually reviewed and reformed in most major metro areas. However, in regional areas, at least in some states, local government models dominate and there are emerging concerns about the financial sustainability, robustness and security outcomes these models support.

Issues of structure and institutions were considered in some detail in the 2008 *Independent Inquiry into Secure and Sustainable Urban Water Supply and Sewerage Services for Non Metropolitan NSW*. This

issue relates more to the preferred institutional and governance arrangements for the water sector and is considered in more detail in earlier chapters.

The report identified a number of serious problems with outcomes in non-metropolitan NSW, notably the failure of 17 local water utilities to meet the microbiological water quality requirements of the Australian Drinking Water Guidelines, 2004 and the occurrence of 22 boil water alerts over the 25 months prior to June 2008. The report identified possible contributing factors as follows:

- difficulties in attracting and retaining skilled staff – many areas of NSW are unable to attract skilled staff owing to declining populations and the associated reduction in the provision of community services
- lack of effective regulatory incentives and sanctions to achieve a high level of compliance with standards and guidelines and to encourage innovation and continuous improvement
- an absence of functional separation – water supply and sewerage are two of many functions performed by councils and compete with other functions for attention and resources
- lack of commercial focus – the multifunctional structure of councils may tend to inhibit the establishment of commercially focused business units.

The report found that smaller utilities tended to perform poorly relative to large utilities (with the latter having superior access to specialist skills and financial resources). It then recommended aggregation (from 104 local utilities to 32 groups or from 104 utilities to 15 groups).

The majority of jurisdictions have acknowledged the need to aggregate water functions to overcome such problems. For example, WSAA supports the extent of recent reforms in Tasmania to transfer planning and supply functions from numerous local councils to larger entities whose functions and responsibilities relate solely to the water sector.

WSAA understands that Infrastructure Australia is soon to release a report that investigates the ability of local government utilities to deliver water services.

Key conclusions and recommendations

- A stronger evidence base would be needed to support any move towards structural separation as a means of encouraging retail contestability.
- Following on from NSW and Victoria, the introduction of third party access regimes in all the States and Territories based on nationally consistent principles.
- Reform should only proceed if it delivers superior outcomes for customers and environment and the marginal social benefits exceed marginal social costs.
- Reform of local government utilities. A ‘one size fits all’ approach is not appropriate for the urban water industry. Solutions for large vertically integrated utilities will be different from reforms required in local government utilities.

pwc.com.au