Australian Government
Productivity Commission

Australia's Urban Water Sector

Productivity Commission Issues Paper

September 2010

THE ISSUES PAPER

The Commission has released this issues paper to assist individuals and organisations to prepare submissions to the inquiry. It contains and outlines:

- the scope of the inquiry
- the Commission's procedures and approach
- matters about which the Commission is seeking comment and information, and
- how to make a submission.

Participants should not feel that they are restricted to comment only on matters raised in the issues paper. The Commission wishes to receive information and comment on issues which participants consider relevant to the inquiry's terms of reference.

Key inquiry dates

Receipt of terms of reference	22 July 2010
Due date for submissions	5 November 2010
Initial public hearings	November/December 2010
Release of draft report	March 2011
Draft report public hearings	May 2011
Final report to Government	July 2011

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The Productivity Commission

The Productivity Commission is the Australian Government's independent research and advisory body on a range of economic, social and environmental issues affecting the welfare of Australians. Its role, expressed most simply, is to help governments make better policies, in the long-term interest of the Australian community.

The Commission's independence is underpinned by an Act of Parliament. Its processes and outputs are open to public scrutiny and are driven by concern for the wellbeing of the community as a whole.

Further information on the Productivity Commission can be obtained from the Commission's website (www.pc.gov.au) or by contacting Media and Publications on (03) 9653 2244 or email: maps@pc.gov.au

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1 What has the Commission been asked to do?

Australia's urban water sector is responsible for providing water and wastewater services to households and commercial and industrial businesses. This includes bulk water harvesting and manufacturing, storage, treatment, distribution and wastewater treatment and disposal. Historically, these services have been provided by publicly-owned (state or local government) entities, which have often been vertically-integrated regional monopolies.

The history of urban water reform goes back at least to the early 1990s, when the Industry Commission conducted an inquiry into water resources and wastewater disposal (IC 1992). Subsequently, the Council of Australian Governments (COAG) established a framework for achieving an efficient and sustainable water industry (COAG 1994). In 1995, COAG agreed to implement the National Competition Policy (NCP), and associated NCP payments to jurisdictions were linked to related water reforms (COAG 1995). Building on the preceding frameworks, COAG agreed to the National Water Initiative (NWI) in 2004, which included actions and outcomes related specifically to urban water reform (COAG 2004). Due to growing challenges in the urban water sector, particularly security of supply, COAG enhanced the national urban water framework in 2008 (COAG 2008).

In recent years there have been concerns about the performance of urban water systems in metropolitan and regional areas, related to the capacity of the sector to meet demand in light of challenges such as drought, climate change, population growth and water quality issues. A decrease in water stored in dams has led to prolonged use of water restrictions and increased investment in supply augmentation in many jurisdictions.

In light of these concerns and challenges, most states and territories have released water plans detailing priority areas for action. In addition, there have been a number of reports and reviews published that discuss the efficiency of the urban water sector, including:

- the National Water Commission's (NWC) biennial assessments of progress under the NWI (NWC 2007; NWC 2009a)
- PriceWaterhouseCoopers' *Review of urban water security strategies*, undertaken at the request of Infrastructure Australia (PWC 2010)
- Frontier Economics' *Urban water markets*, a report prepared for the Joint Steering Committee for Water Sensitive Cities (Frontier Economics 2008b).

Against this backdrop, the Commission has been asked to report in 12 months on the case for microeconomic reform, and identify pathways to achieving improved

resource allocation and efficiency in the urban water sector. Specifically, it is required to:

- identify the opportunities for efficiency gains, which might be achieved through changes to structural, institutional, regulatory, and other arrangements in the Australian urban water and wastewater sector
- provide options to achieve the identified efficiency gains, and quantitatively assess these options (to the fullest extent possible) to identify their:
  - economic, social and environmental impacts
  - impacts on Australian governments, business and consumers
  - propensity to facilitate supply and demand planning and decision-making in the medium and long term
- propose a work program including implementation plans for the options, identifying
  - practical actions that the Commonwealth, state and territory governments and local governments can undertake to implement options for reforms, including any transitional arrangements
  - priority areas where the greatest efficiency gains are evident and where early action is practicable
  - quantitative and qualitative indicators that can be used to monitor changes in efficiency in the urban water and wastewater sectors.

The full terms of reference for this inquiry are set out in attachment A.

There are also several other concurrent projects that may touch on similar issues that this inquiry will cover:

- The NWC is undertaking a project *Developing future directions for urban water reform*, which is due for completion in February/March 2011.
- The Committee for Economic Development of Australia (CEDA) has announced a project titled *Australian Water Resources*, in partnership with Uniwater and Harvard University.
- Infrastructure Australia is currently developing a plan of action in response to PriceWaterhouseCoopers' *Review of urban water security strategies* report.

The Commission will liaise with these organisations to try to achieve synergies and minimise duplication of analytical effort, as far as practically possible.

The Commission's approach

The Commission is proposing to take the following approach to the inquiry:

- Clarify what the objectives for the urban water sector should be.
- Identify the policy and other impediments to achieving these objectives and assess the potential benefits from overcoming them.
- Examine the range of policy tools that governments could implement to address these impediments (for example, changes to governance arrangements, institutional reform or structural changes to promote competition and contestability in parts of the supply chain).
- Develop reform options, where each option is an integrated package of institutional, regulatory and structural tools designed to achieve the objectives.
- Weigh up the costs and benefits of each option and identify a preferred, or set of preferred, options.
- Develop a work program for reform and a monitoring framework to assess the performance of the program.

The circumstances of the urban water industry vary across regions and it is likely that a one size fits all approach would be inappropriate.

The Commission will consult widely with stakeholders, drawing on input from participants through consultations, roundtable discussions, written submissions and public hearings. Material from other concurrent reviews, as well as past reports and reviews, will also be drawn on.

The Commission is proposing to define 'urban' as metropolitan or regional areas that have a reticulated water supply provided by a water supplier (box 1). This covers large cities, smaller cities and towns, as well as smaller communities, including some Indigenous communities.

2 How you can contribute to this inquiry

The purpose of this issues paper is to provide background material and information on some of the issues the Commission has identified, and to guide contributions by participants. However, **you do not have to answer all of the questions posed in this paper, or draft your submissions as literal answers to the questions, or limit your comments to the issues mentioned**. The Commission encourages submissions on any issues relevant to the inquiry's terms of reference. Sections 3 to 9 of this paper set out many issues and questions in detail.

The key questions are:

What objectives should governments have for the urban water sector?

What are the impediments to achieving those objectives?

Is there a strong case for reforming Australia's urban water sector? What is it?

How large are the opportunities for efficiency gains?

What are the main reasons that these potential gains are not being realised at present?

Which options for reform offer the largest benefits in metropolitan and regional urban areas?

Box 1 **Definitions of commonly used terms**

Aquifer — a geologic formation that is capable of holding water and through which water can percolate.

Bulk water supply — harvesting and manufacturing of water, including catchments, dams, aquifers, desalination and recycling.

Groundwater — water occurring naturally below ground level (whether in an aquifer or otherwise) or water occurring at a place below ground that has been pumped, diverted or released to that place for the purpose of being stored there, but not including water held in underground tanks, pipes or other works.

Recycled water — treated wastewater that is used by either the water utility itself, a business supplied by the water utility, or supplied through a third pipe system for urban reuse.

Sewerage — the physical infrastructure used to transport sewage.

Surface water — water flowing or held in streams, rivers and other wetlands in the landscape.

Urban water sector — covers the supply and consumption of water in cities, towns and regional centres that have a reticulated water supply provided by a water supplier, as well as the treatment and disposal of wastewater.

Wastewater — any water that has been used once and cannot be used again without treatment. Includes sewage (residential waste), tradewaste (commercial and industrial waste), greywater and stormwater.

Sources: WSAA et. al. (2009); NWC (2009b) ; ABS (2006).

Attachment B provides further information on how to make a submission and the submission cover sheet is provided in attachment C. The Commission is particularly interested in receiving submissions from consumers and consumer groups, water

industry organisations, and researchers. Submissions commenting on Australia-wide issues, as well as submissions that concentrate on a particular jurisdiction or local region are welcome.

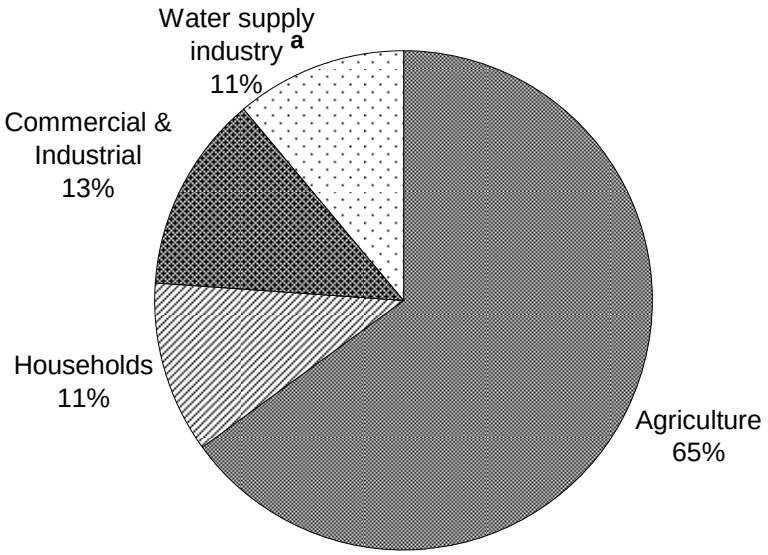
3 The urban water sector in Australia

The urban water sector provides water and wastewater services to households and commercial and industrial users. It comprises metropolitan areas as well as regional urban areas.

Agriculture is by far the largest consumer of water in Australia, accounting for 65 per cent of total consumption in 2004-05 (figure 1). In contrast, households account for 11 per cent of consumption, and commercial and industrial users account for 13 per cent.

The urban water supply chain is illustrated in figure 2, together with a breakdown of the share of costs attributed to each element in a typical Sydney water bill. Wastewater treatment and disposal is the largest cost to end users (around one third), and is significantly larger than the cost of bulk water supply. The proportion of costs in each element of the supply chain is likely to vary across cities and towns.

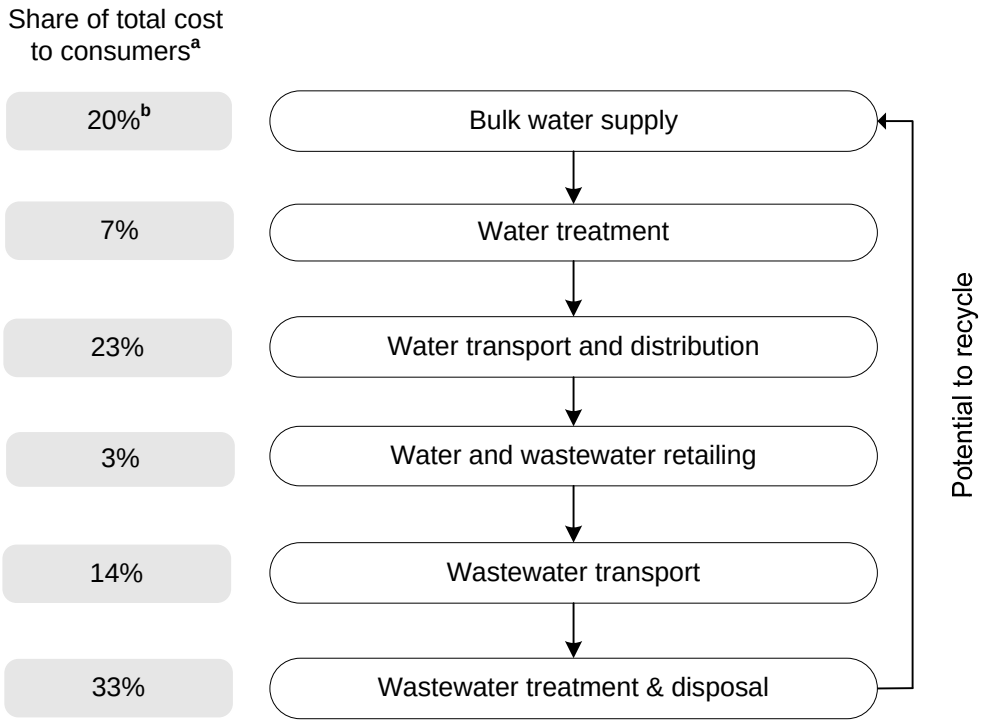
Figure 1 **Water consumption in Australia 2004-05**



a Includes sewerage and drainage services and water losses; excludes the supply of water to other users.

Data source: ABS 2006.

Figure 2 **Water and wastewater supply chain**



a Represents the share of costs in a typical $1000 water and wastewater bill in Sydney. **b** Of this 20 per cent, about half relates to dam water and the other half to desalination.

Sources: based on Allen consulting 2009 and Schott 2010.

The industry structure of the supply chain varies across jurisdictions. In some, such as South Australia and Western Australia, water is supplied by vertically-integrated state-owned monopolies (box 2). However, since COAG established the 1994 framework, some jurisdictions, such as Melbourne, have moved towards structural separation of functions in the supply chain. In some areas, local governments provide water and wastewater services.

Most urban water in Australia is sourced from surface water. Rainfall-fed dams are the main source of water for most cities and regional areas, including Sydney, Melbourne and south east Queensland. The capital cities that do not rely primarily on dams are: Hobart — which sources most of its water from the Derwent River; Adelaide — which sources a large proportion of its water from the River Murray; and Perth — which sources a large proportion from groundwater (PC 2008).

Box 2 Industry structure of the urban water sector, by state and territory

New South Wales

In Sydney, and some surrounding areas, bulk water is supplied by a single state-owned organisation, with the remaining elements of the supply chain being the responsibility of another state-owned organisation. In other areas, water and wastewater services are provided by statutory authorities or local governments. Some of these control bulk supply and others procure water from state-owned entities.

Victoria

In Melbourne, bulk water is provided by a single state-owned supplier, which is vertically separated from three state-owned retail water businesses. Water and wastewater services in regional Victoria are provided by regional water authorities. Some of these procure bulk water from rural water businesses.

Queensland

In south east Queensland, two state-owned authorities manage separate bulk supply sources and treatment. Water transport and distribution is the responsibility of another state-owned authority. There is also a statutory authority that manages the strategic operations of the water grid that services south east Queensland. Three council-owned entities procure water from the water grid manager to provide water and wastewater retail services. Outside the area supplied by the grid, local governments and state-owned water boards provide water services. Some control their own bulk water supply and others procure water from state-owned entities.

Western Australia

Water and wastewater services are provided to Perth and most regional areas by a vertically-integrated, state-owned monopoly. In some regional areas, retail services are provided by other government statutory authorities. Local governments provide wastewater services in some areas.

South Australia

Water services are provided to Adelaide and regional areas by a vertically-integrated state-owned monopoly. Natural Resource Management Boards and local governments provide associated services such as stormwater and drainage.

Tasmania

Tasmania has been divided into three regions, with a vertically-integrated local government-owned entity supplying water and wastewater services in each.

(Continued next page)

Box 2 (continued)

Australian Capital Territory

Water and wastewater services are provided by a vertically-integrated state-owned monopoly.

Northern Territory

Water and wastewater services are provided to Darwin and regional communities by a vertically-integrated, state-owned monopoly.

Sources: PWC (2010); Queensland Water Commission (2010).

Australia's reliance on surface water, and dams in particular, means a high reliance on rainfall and inflows. In many places across Australia both rainfall and inflows have been generally below historical averages over the last decade or more, due to drought/climate change. For example, inflows in Victoria for the decade from the mid 1990s were around 40 per cent lower than the long-term average (CSIRO 2007). In the south west of Western Australia, lower than average inflows have been experienced over a considerably longer period. In the last year or two, by contrast, rainfall and inflows have been average to above average across much of eastern Australia, including in Sydney's catchments and in south east Queensland.

In response to increasing demand and decreasing water availability many jurisdictions have implemented water restrictions to ration supply in the short term, and increased investment in supply for the long term. Supply augmentation investments include the following.

- Desalination plants have already been completed in Sydney, south east Queensland and Perth. Additional desalination plants are under construction to service Melbourne (due for completion in 2011), Perth (2012) and Adelaide (2012).
- The Sugarloaf pipeline, which transports water from the Goulburn River to supply Melbourne.
- Water recycling, which is being pursued in many cities, including through greater capture and use of stormwater.
- An increase in households installing rainwater tanks and greywater recycling systems, sometimes with government subsidies (Barker, Murray and Salerian 2010; PWC 2010).

4 Efficiency and other objectives

Why reform?

Microeconomic reform can include elements such as changes to institutional and regulatory arrangements, the introduction of greater levels of competition and increased reliance on markets. It should always be kept in mind, however, that these are simply tools to achieve an objective and not goals in their own right. They are worthwhile only where they can be used to achieve better overall outcomes for the Australian community.

Consistent with the terms of reference, an important criterion by which the Commission proposes to assess reform options is economic efficiency. Economic efficiency requires the efficient allocation of all resources, including water. Efficiency has several dimensions (box 3).

Box 3 Dimensions to economic efficiency

Overall efficiency requires the pursuit of productive, allocative and dynamic efficiency.

Productive efficiency requires that goods and services be produced at the lowest possible cost. For example, where there are several possible methods for producing a given quantity of water (of equal quality, reliability, etc) the method that has the lowest cost offers the highest productive efficiency.

Allocative efficiency requires that the set of goods and services produced from the available resources is the set that maximises value to consumers. In this context, 'resources' includes the available water as well as the labour, energy and capital used to deliver water and remove and treat wastewater. The efficient allocation of these resources provides the mix of goods and services, including environmental outcomes, that maximises society's wellbeing.

Dynamic efficiency requires that investments that are expected to produce more efficient production possibilities in the future (as technology evolves and the availability of inputs changes) are made whenever the expected benefits to consumers exceed the costs. Examples include investments in research and development and in upgrading the technology used in water supply systems. It is also the case that some reform options might create an environment that is more conducive to ongoing innovation in the water sector, and dynamic efficiency requires that this be taken into account.

Improving the efficiency of the urban water sector can:

- reduce the average price of water and wastewater services (below what it would have been otherwise)

- improve levels of service, for example, less frequent resort to water restrictions
- improve environmental, urban amenity and social outcomes
- reduce calls on general public finances (and therefore, taxpayers) to assist with upgrading water-related infrastructure.

Moreover, the efficient allocation of national water resources should ensure that water is allocated to its highest value end use. These uses include inside and outside household use, industrial and commercial use, parks and other public spaces, maintaining environmental assets, and agricultural use.

Setting objectives

It is necessary to have a clear understanding of what objectives governments should set for the urban water sector before the case for reform can be assessed and reform options designed. Having an efficient sector is one important objective but, given that water is an essential service, so too is ensuring that all households have access to and can afford a minimum level of water services. There may also be other objectives.

In the course of the inquiry, the Commission is proposing to develop a detailed definition of an efficient urban water sector. A more generalised characterisation is that an efficient urban water sector is one in which consumers are reliably able to use the water and wastewater services that they are willing to pay for (allocative efficiency and dynamic efficiency), with those services supplied at the lowest possible cost (productive efficiency) and with no unnecessary impediments to innovation (dynamic efficiency). This requires, among other things, that:

- a level of water security is achieved that balances the risk of building new supply capacity that proves to be unnecessary (or premature) against the risk of incurring the adverse consequences that arise when severe rationing of water (using either prices or quantity restrictions) becomes necessary (section 5)
- the value that people place on using water is taken into account in decisions about when and how much to increase supply capacity
- water quality does not fall below the standard required by users and does not pose a threat to public health
- the value that the community places on urban amenity derived from the use of water (for example, green parks and playing fields) and environmental outcomes (for example, healthy river ecosystems and reducing greenhouse gas emissions) is appropriately factored into decision making.

Properly developed, therefore, the concept of economic efficiency encapsulates many of the objectives that are generally considered to be important for the urban water sector, including those related to water security, water quality and the environment.

There may, however, be some objectives that cannot be achieved through focusing on economic efficiency. For example, achieving equity or social objectives may require specific actions that come at some cost to efficiency. Where this is the case, it is desirable to seek arrangements that minimise the efficiency cost.

What are the objectives that should guide reform of Australia's urban water sector? Should the objectives be the same across all urban water systems?

How should water supply and security objectives be framed? For example, should they be in terms of the frequency of water restrictions? Is the economically efficient level of water security desirable or should some other level be pursued?

What is an acceptable minimum level of water services for households? Is this level best achieved through water pricing arrangements, or through the social security and taxation systems?

Is there a need for specific environmental objectives for the sector? If so, what should they be?

Are some objectives more important than others? How should tradeoffs between objectives be made?

Achieving objectives

Once the appropriate objectives have been clarified, the next step in assessing the case for reform is to identify the impediments to achieving them and the potential benefits from overcoming them. The following sections explore this in detail, but there are some high level policy issues that are worth considering up front.

The first of these is the need for government water policies to support, and be consistent with, the objectives. For example, policies that prevent the transfer of water from low to high value uses will impede the efficient allocation of water. Similarly, policies that require a specific dividend from water utilities regardless of circumstances can distort investment decisions and result in suboptimal pricing strategies. Such policies constrain the gains available from reforming institutional, regulatory and structural arrangements and impose an implicit cost on the community arising from distortions in resource allocation.

Are there any current government water policies that impede the achievement of the objectives that should be pursued for the urban water sector? If so, what impediments are there and how significant are they?

The other high level consideration is that the case for reform needs to be based on a sound understanding of the characteristics of the urban water sector. Some of the characteristics of the sector that may have relevance to determining the scope for welfare enhancing reform include that it:

- is critical for public health
- relies on variable inflows to dams and rivers
- has natural monopoly elements in the supply chain (that is, elements that would be inefficient to duplicate, such as distribution networks)
- faces potential barriers to expanding networks/grids because water is heavy and can be costly to transport over long distances or up hill
- deals with a product that can be stored
- has sources of supply that vary in quality, cost and scope to harvest/extract sustainably over time
- faces multiple environmental issues.

It is notable that some of these characteristics are unique to the water sector (such as the degree of production variability due to climate) and some are common with other utility sectors (such as there being natural monopoly parts of the supply chain). These differences and similarities mean care is needed in drawing lessons from reforms in other sectors.

Even though there has been a long history of reform in the urban water sector, it has been suggested that the sector is not as far advanced as some other utility sectors in Australia. For example, the NWC has stated that '… structural reform in the [urban water] sector has generally not kept pace with that in similar sectors such as gas, electricity or transport' (NWC 2007, p. 21).

If this is the case, it is possible that the experience of reform in other sectors may yield useful lessons for the urban water sector about:

- the nature, and possible quantum, of benefits that may be achievable from further reform
- the types of reforms that could be pursued.

Alternatively, it may be that the degree and pace of reform in the urban water sector is appropriate given the particular characteristics of the sector.

What lessons of relevance to future reform of the urban water sector can be taken from reform in:

- *other utility sectors*
- *the rural water sector*
- *the natural resource management sector*
- *the urban water sector in other countries?*

Are there urban water reforms that have occurred in particular jurisdictions that could usefully serve as a model for other jurisdictions?

Do the particular characteristics of the urban water sector constrain the scope for reform? If so, which of these characteristics is of most significance in this regard and why?

Is there greater or lesser scope for reform in regional urban compared to metropolitan urban areas?

5 Supply of water and wastewater services

Supply augmentation planning and decision making

At present, the need for investment to augment urban water supply is usually determined by state or local governments through planning processes. This is different from the situation with most goods and services, where prices indicate the need for additional investment by private suppliers in a decentralised market (sometimes this occurs within an institutional and regulatory framework established by governments). Whether centralised planning should continue in the long term is a question that will be considered in this inquiry, and section 7 of this paper on contestability and competition will explore some of the relevant issues.

Where centralised planning processes are used it is important that they help meet the objectives set for the urban water sector. The extent to which this is achieved may depend on factors such as whether there is:

- a well-defined water supply and security objective that balances the costs and benefits of different levels of supply and security (box 4)
- clear accountability as to who is responsible for meeting this objective through augmentation planning and decision making

- adequate consideration of the role of demand management options (such as flexible pricing, promotion of end- use water efficiency and conservation and use of water restrictions) in balancing supply and demand
- use of the best available data on population growth, trends in per capita consumption and likely variability of inflows to dams (taking into account the influence of droughts and climate change)
- assessment of all possible supply augmentation options (including desalination, water recycling, new or expanded dams, rural–urban transfer, tapping groundwater sources and rainwater tanks) in a way that takes into account factors including cost, reliability, environmental impacts, community acceptance and time needed to bring them on line.

Box 4 **How much water security is optimal?**

The level of a city or town's water security can be assessed as the proportion of years in which its water use will need to be restricted by substantial increases in water prices or by severe non-price restrictions. Extra water security can be obtained by investing in additional water supply infrastructure or by establishing options to access water — or by modest reductions in water use when water is relatively abundant, so that it can be kept in storage for use during dry periods.

The cost of an urban water system that could be guaranteed to always meet water demand without the need for price increases or non-price restrictions during periods of relative scarcity will generally be much higher than one that relies on price increases or restrictions some of the time. The precise nature of the tradeoff between the level of water security and cost would vary between customers, but most households and firms would choose a level of water security involving some degree of rationing (through restrictions on use or raising price above its 'normal' level) rather than pay a substantially higher water price every year for a 'Rolls Royce' water supply that always (more realistically, almost always) met their demand.

Expressed differently, a level of investment in water infrastructure that sometimes requires price or quantity-rationing of water is more economically efficient than a level that requires many billion dollars worth of capacity that is unused in all but a one-in-200 year ultra-dry period.

Source: adapted from PC (2008).

The variability of inflows to dams, uncertainty over future climate change and other factors mean that supply augmentation decisions will not always appear appropriate in hindsight. The best that can be achieved is to make decisions that enable water supply/security objectives to be met at least *expected* cost. Some analysts have suggested that this requires explicitly taking uncertainties into account in a way that recognises that important new information is likely to become available over time

(ERA 2008). This is often termed a 'real options' approach. For example, it may be worth incurring some costs in the short term if this allows a large and expensive supply augmentation to be deferred for a year or two. If inflows over this period were low, the investment may need to proceed, but if not, the investment may not be needed for a decade or more (with significant cost savings accruing over this period).

Is there scope to increase the efficiency of supply augmentation planning and decision making? If so, how significant are these opportunities? What is preventing them from being realised at present?

Should supply augmentation planning be guided by a water security objective? Does this occur at present? If so, who sets the objective and how is it set?

Who makes supply augmentation decisions at present? Is there clear process, accountability and transparency for decision making?

How are environmental considerations taken into account in decision making? Are there improvements that could be made in this regard?

Are all supply augmentation options considered, or are there implicit or explicit 'policy bans' on certain options?

Under what circumstances should water transfers from irrigators to urban use (and vice versa) occur? Should individual irrigator's willingness to sell and urban utilities' willingness to pay govern water transfers or should broader social and resource issues also be considered? What are the costs and benefits associated with your preferred approach?

Should an options approach to supply augmentation be taken? Is this done at present?

Once a decision is made to proceed with a supply augmentation project, efficiency requires that it be implemented at minimum cost. A common approach taken is for water utilities to seek expressions of interest to supply projects. Sometimes public–private partnerships are entered into that include 'Build Own and Operate' or 'Build Own Operate Transfer' arrangements.

Are supply augmentation projects generally implemented at minimum cost? If so, what are the features that deliver this outcome? If not, why is this the case?

Utilising and operating sources of supply

Some sources of supply (for example, desalination and water recycling) have significant operating costs. In some circumstances, such as when dam levels are high, it may be worth avoiding some of these costs by slowing or ceasing water production.

Are the operating costs of desalination and water recycling plants appropriately taken into account in decisions on when to operate them?

Operating desalination and recycling plants efficiently may have consequences for recovery of their capital costs.

Who should bear the risks for recovery of capital costs? Should these costs be recovered through the tax system, fixed charges on water users or volumetric charges on water users?

The quantity and quality of water yielded from the water catchments that are used for urban supply is influenced by catchment management practices. Catchments are managed for a range of values (for example, biodiversity conservation, agricultural production and wood production) and so water yield is often one consideration among many.

Is the management of water catchments appropriately influenced by the value of the water that they yield? If not, what is preventing this from occurring?

Water treatment, transport and distribution

Costs associated with treating, transporting and distributing water usually make up a substantial proportion of overall costs in the urban water sector. This suggests that the inquiry should give considerable attention to examining potential efficiency gains in these parts of the supply chain. Maintaining and replacing long-lived capital assets (such as pipes) makes up a large share of total cost and so asset management seems likely to be an important issue.

Is there scope to increase the efficiency of water treatment, transport and distribution? If so, how significant are these opportunities? What is preventing them from being realised?

Are water quality standards being consistently met? If not, why? Are the regulatory standards appropriate?

Wastewater services

The collection, transportation and treatment of wastewater also accounts for a substantial proportion of the overall costs in the urban water sector. These services are important for the protection of human health, the environment and quality of life. Achieving efficient provision of wastewater services depends on a range of factors including asset management, operational arrangements and the water quality standards that govern the levels of treatment required. Efficiency also depends on taking up any opportunities to create value (and revenue) from wastewater services through activities such as nutrient recovery, energy generation and recycling water.

Is there scope to increase the efficiency of wastewater services? If so, how significant are these opportunities? What is preventing them from being realised?

Are there particular challenges and opportunities in providing wastewater services in regional urban areas?

Are wastewater systems performing well from an environmental perspective?

Integrated water management

The inquiry terms of reference require the Commission to have regard to emerging water management practices, including integrated water management. Integrated water management is related to the notion of 'water sensitive cities' and the two terms are sometimes used interchangeably (NWC 2009a).

A major theme in the literature on integrated water management is that there are benefits from managing water on a whole-of-water-cycle basis, including through the recycling and reuse of stormwater and wastewater. These benefits can include:

- obtaining new sources of water (of varying qualities suitable for a range of end uses) and creating value and revenue from them
- avoiding costs associated with transporting and treating stormwater and wastewater
- reductions in the occurrence and severity of floods
- improved urban amenity and environmental outcomes.

Urban planning authorities, local and state governments, water utilities, and environmental and health regulators all appear to have a role in integrated water management, which suggests that achieving appropriate coordination may be an important issue.

Are there efficiency gains available from the wider adoption of integrated water management? If so, what is preventing these from being realised?

What examples are there of good practice in integrated water management?

6 Consumption and pricing

The demand for water, or the willingness of users to pay for it, is derived from the many uses to which it is put by households and firms and their ability to pay for it. In addition, wastewater services provide a critical public health function by removing and treating sewage, tradewaste and stormwater. In Australia, virtually all individuals and firms in urban areas have access to, and benefit from, the use of water and wastewater services provided by water utilities.

The demand for water and wastewater services is an important consideration in the planning of Australia's cities, towns and regional urban centres. In more recent years, public policy makers have become concerned about the potential for normal demand to exceed the capacity of systems to supply. These pressures have arisen from prolonged drought/climate change, which has reduced inflows and led to low water levels in dams. To reduce or eliminate excess demand, governments have principally relied on water use restrictions and other non-price demand management measures (in combination with supply augmentations, such as desalination plants).

The Commission is interested in information and research on the forecast future demand for urban water in metropolitan and regional urban areas.

What impact might growth in population, and trends in technology, consumer behaviour and climate have on the demand for water and wastewater services in the future?

The quality of water demanded can depend on the end use. For example, the quality required for human consumption is generally higher than that required for watering parklands and playing fields, and for many industrial uses. In some cases, non-potable water is a substitute for potable water.

How might demand for different qualities of water (for example, potable and non-potable water) evolve?

Scope for more efficient pricing?

Pricing of water and wastewater services may occur at both the bulk and retail level. Policy makers may have a number of objectives for pricing, with the ultimate goal of maximising benefits to consumers, including:

- enabling universal access and affordability for consumers
- encouraging the use of water and wastewater services by users who value them most highly and in uses that are most highly valued (allocative efficiency)
- providing appropriate signals for investment in infrastructure that delivers water and wastewater service capacity, reliability and quality (dynamic efficiency)
- recovering costs and providing water utilities with sufficient revenue to be financially sustainable
- ensuring that pricing is transparent, flexible and administratively simple (Frontier Economics 2008a).

Reflecting the monopoly status of water utilities, pricing for water and wastewater services in Australia is regulated, with prices set administratively by governments or regulated by independent regulators acting on their behalf. As a result of these processes, a number of different approaches to water and wastewater pricing have been implemented across Australia (box 5).

Price regulation typically involves implementing price or revenue caps that are reviewed every three to five years, and calculated to ensure revenue is sufficient to cover water utilities' efficient costs. There is usually a high degree of transparency, community consultation and accountability embodied in the regulatory decision making process.

The recent introduction of widespread water restrictions to manage demand has highlighted issues in water pricing and the way demand and supply are coordinated over time, particularly in light of variable rainfall. Debate about the pricing of water has centred on the desirability and practicality of introducing more flexible pricing arrangements. Such arrangements could result in more variable prices, with lower prices in periods of higher supply and higher prices in periods of lower supply, to reflect the underlying (scarcity) value of water consumption to consumers.

Other options for pricing reform that have been raised recently include:

- removing or modifying inclining block tariffs
- removing 'postage stamp' pricing policies and allowing prices to vary by location, based on the efficient cost of supply

Box 5 Pricing of water and wastewater services in Australia

Water

The most common arrangement for water pricing is a two-part tariff, comprising a fixed component and a volumetric component with either a flat or inclining block structure. In inclining block tariffs, prices increase with successive blocks of water consumed. The rationale for this is that the initial block provides an amount of essential water at a low and readily affordable price (either at or below long-run marginal cost (LRMC) — see below) and conservation is encouraged at higher consumption levels.

Wastewater

There is significant variation in the pricing of wastewater services across Australia. For many domestic consumers, sewage charges are applied as either a fixed charge, a percentage of property value, or as a two-part tariff comprising a fixed charge and a volumetric component (sometimes based on an estimate of the proportion of metered water use that will become sewage).

Charges for tradewaste (liquid waste produced by commercial and industrial businesses) also vary widely and may be a fixed charge, or have both fixed and volumetric components. Volumetric charges may vary depending on the composition of the liquid waste being discharged.

Setting prices — long-run marginal cost

The selection of appropriate prices for water and wastewater services is a complicated process. Pricing allows a water utility to recover its costs and make a return on capital, and sends signals to consumers about the cost of providing a service, as well as providing incentives for suppliers and users to consider innovative ways of supplying and using water (dynamic efficiency). It can also provide a means for managing the sharing of risk between consumers and suppliers. The most common method of pricing water and wastewater services is to set the volumetric price (the flat volumetric tariff or at least one block of an inclining block tariff) equal to the LRMC of supply, and to use fixed charges to make up the required revenue for the water utility.

The LRMC is an estimate of the long-run incremental cost of providing an additional unit of water or wastewater service, including the capital costs (in many cases) of the infrastructure required to deliver that service. In theory, setting volumetric water and wastewater prices at LRMC signals to consumers the cost incurred in providing the next unit consumed (opportunity cost) and, combined with a fixed charge, should result in a reasonably efficient level of consumption and sufficient revenue for the water utility.

However, where there is shorter-term variability in supply, as has been experienced in Australia in the past decade, setting prices to users at LRMC is less efficient because it encourages underconsumption when water is abundant and overconsumption when water is scarce. Also, the prevalence of inclining block tariffs and postage stamp pricing (charging the same price regardless of the cost of supply) necessarily requires the departure from LRMC for many customers, further eroding efficient pricing.

- wider implementation of full cost recovery pricing
- establishing multiple service offerings allowing consumers to elect to pay more to secure their water supply and avoid restrictions
- taking account of environmental externalities in the pricing of water and wastewater
- allocating entitlements for urban water and using markets to determine prices
- greater use of metering or discharge factors for sewage and tradewaste pricing, and use of load factors for tradewaste pricing.

There have also been calls for changes to metering and billing arrangements to make price signals more effective. These include making renters rather than property owners responsible for water bills, mandating individual metering of multi-dwelling properties, more frequent billing and the introduction of smart meters (which allow continuous electronic monitoring of water use). However, some of these options entail additional costs and this should be taken into account in assessing the overall efficiency of the option.

The Commission seeks views on whether there are opportunities for efficiency gains in the pricing of water and wastewater services, and how these efficiency gains could be realised.

How do current water and wastewater pricing arrangements perform against the efficiency, equity/social and other relevant objectives? Is there scope to improve the efficiency of pricing? How would this best be achieved?

Are consumers willing to pay more for water in order to forgo water restrictions? How much would they be willing to pay?

Should more flexible (scarcity-based) pricing be introduced to assist in managing demand in the face of the variability of rainfall-dependent supply?

What are the environmental externalities of water and wastewater service consumption? Should these externalities be accounted for in water and wastewater pricing? If so, how would this be best achieved?

To what extent are efficiency gains in the supply of water and wastewater services dependent on pricing reform (that is, on obtaining better price signals to guide supply augmentation investment)?

Can improvements be made in the area of metering and billing? What changes could be made? What are the costs and benefits of these changes?

The effectiveness of price in managing demand depends in large part on how sensitive consumers are to the price of water, and the control they have over their water use. Economists use the term 'price elasticity of demand' to quantify this sensitivity. An elasticity of zero means that users continue to use the same quantity when prices go up (that is, demand is totally inelastic), and an elasticity of -1 means that, say, a 5 per cent price increase would bring about a 5 per cent decrease in demand. Some Australian studies estimate that the price elasticity of demand for water is in the range -0.3 to -0.5 (PC 2008), while some water utilities have suggested that demand is more inelastic than this (that is, closer to zero).

How responsive to changes in price is the demand for water for residential (indoor and outdoor use) and commercial/industrial use?

Are elasticities different in the short run compared to the long run (due to consumers having more time to become aware of price changes and respond to them)?

What is the evidence on the price elasticity of demand for water?

What impact has the imposition of restrictions and other non-price demand management measures had on the price elasticity of demand for water?

Equity

As discussed previously, water and wastewater services are considered to be essential services and some level of access is desirable for everyone. As such, ensuring universal and affordable access to water and wastewater services is an important objective for policy makers.

In pursuing universal and equitable access, policy makers have taken a number of approaches including:

- using restrictions and other non-price demand management measures in lieu of higher prices
- inclining block tariffs with an initial block priced below cost
- uniform or postage stamp pricing across regions
- rebates on water and wastewater bills and income support for low-income consumers
- requiring utilities to maintain and comply with hardship policies that protect consumers from the imposition of flow restrictions or disconnection.

The Commission is interested in information on the affordability of water and wastewater services for low-income consumers and the efficacy and efficiency of policy measures designed to improve access and equity.

Is equitable access to water and wastewater services a significant issue in Australia? What groups of consumers are particularly vulnerable and why?

If equity/social objectives are to be pursued, how should they be paid for and what are the costs to other water consumers and taxpayers?

Are water restrictions and other non-price demand management measures, inclining block tariffs and postage stamp pricing equitable?

Are the existing measures to provide universal and equitable access effective and efficient? Is there scope for improvement? What are the alternative measures available to policy makers?

What influence (positive or negative) might wider reform of price and/or non-price demand management measures have on equity?

Non-price demand management

Policy makers have mainly responded to excess demand through non-price demand management measures. The most significant of these has been water restrictions. However, information campaigns, voluntary targets, water efficiency labelling, financial incentives for water efficient technologies and other strategies have also been used.

By proscribing certain uses for water, restrictions deny households and some businesses the opportunity to choose how to use and/or conserve water. This can expose them to a number of costs, such as the cost of installing rainwater tanks or having gardens deteriorate. Other non-price demand management measures may also have considerable costs for consumers and taxpayers.

The Commission is seeking views on the efficacy and efficiency of non-price demand management measures and how they can be improved.

Have the non-price demand management measures implemented by policy makers been effective?

What kinds of costs have these measures imposed on consumers? What is the evidence on how large these costs are?

Compared to price-based approaches, what are the advantages and disadvantages of non-price approaches?

Of the various non-price and pricing approaches to managing demand, which would consumers prefer?

How might the design and implementation of non-price demand management measures be improved if policy makers elect to use them in the future?

What are the costs and benefits of information campaigns, voluntary targets and water efficiency programs? How do they compare with more prescriptive water restrictions? How effective would these measures be in the absence of water restrictions?

7 Scope for competition and contestability

One way to improve efficiency in the supply of water and wastewater services is by establishing competition or contestability where possible. However, this also involves costs. In assessing the case for promoting competition or contestability, it is necessary to compare the expected efficiency gains with the costs of undertaking such reform.

Competition and contestability explained

Competition or contestability in the provision of goods and services can facilitate delivery of efficient prices and quality services to customers.

Contestability is generally easier to achieve than competition. A contestable market may be served by a small number of firms, but is characterised by low barriers to entry and exit. Firms in a contestable market face competitive pricing pressure because of the threat of potential new entrants (that is, potential competition). Even where a market is served by a single supplier, the threat of entry can exert competitive pressure and result in efficient outcomes for customers.

Contestability in urban water markets might be provided by rival bulk water supply options (for example, a dam, desalination plant, pipeline and recycled water plant). A precondition for contestability is that there be no unnecessary policy impediment to firms providing customers with new water products or service offerings where these are technically and economically viable.

Competition requires the presence of multiple rivals competing to sell or buy a good or service. In a perfectly competitive market every participant is a 'price taker' and does not influence the price of the product it buys or sells. In most markets the seller has some influence over price, but this is temporary as consumers will substitute away from their products to lower priced (or higher quality) alternatives. How quickly they substitute depends on how close the alternative is and the transaction costs of changing supplier.

Competition within the urban water sector is said to exist if customers can choose their water or wastewater service provider from competing businesses. Competition between service providers creates incentives for firms to lower costs and improve service quality. Competitive tendering involves private firms competing for the right to provide a good or service, for example, to construct water system infrastructure. Competitive tendering has also been used to auction the monopoly right to provide water and wastewater services to customers in a defined geographic area.

Because of the incentives created by consumers responding to price and quality, competition and contestability are commonly associated with 'efficient' supply and demand. However, achieving competitive (or even contestable) markets is not always feasible, and is not without costs. Establishing competition is also not the only way, or necessarily the most effective way, to improve efficiency. Many of the opportunities for efficiency gains discussed in the previous two sections could be achieved with or without reliance on competition.

Competition and contestability in Australia's urban water sector

Historically, there has been limited competition and contestability in Australia's urban water sector. Competitive pressure has generally been limited to the contracting out of construction, maintenance and other services by monopoly water businesses on a competitive basis.

In recent years, areas of the urban water sector have started moving toward greater use of market-based approaches. Examples of this are outlined below.

- Introduction of a water grid manager framework in south-east Queensland. This arrangement does not currently and explicitly foster competition. However, it does provide a foundation for subsequent, competition-based reforms, for example the introduction of competition in bulk water supply, or establishment of a third party access regime for monopoly water network infrastructure.
- Development of the southern Murray-Darling basin rural water market. As this market has matured, impediments to trade in water entitlements have been

reduced. While this has mainly benefited irrigators, there has been some trade between the irrigation and urban water sectors.

- Introduction of reforms by the NSW Government to encourage private sector participation in the provision of water and wastewater services. These reforms have been implemented by the *Water Industry Competition Act 2006* (NSW) (WICA). Most notably, WICA establishes:
  - a third-party access regime for water and sewerage infrastructure
  - a licensing scheme to regulate the involvement of the private sector in the supply of reticulated drinking water, recycled water and sewerage services
  - provisions to authorise the Independent Pricing and Regulatory Tribunal (IPART) to arbitrate certain sewer mining disputes.
- A proposal by the Economic Regulation Authority (ERA) for establishment of an independent procurement entity in Western Australia.
- In Queensland, the major industrial and local government customers of the Gladstone Area Water Board (GAWB) have their rights to water (end user entitlements) secured via contractual arrangements with GAWB. These customers are able to trade these water entitlements with other end users (subject to consent by GAWB).
- Consideration of a water grid manager concept in metropolitan Melbourne.

Are there other examples of competition-based reform in the urban water sector?

What lessons can be learned about the costs, benefits and scope for introducing competition-based reforms from developments in the Australian urban water sector to date?

Based on reform experiences in other network utility industries, the particular characteristics of the urban water sector, and the economic analysis undertaken on this issue to date, there appear to be opportunities for developing contestability or even competition in:

- bulk water supply services
- water and wastewater retailing
- the allocation and exchange (or trade) of water and wastewater products
- wastewater treatment and disposal (including recycling).

Reform in these areas could give rise to efficiency benefits, but would also involve institutional and regulatory costs. These costs could be significant, and could result in there being no case for introducing competition-based reform. For example,

introducing retail competition may require development of retail market rules, a third party access regime, a mechanism by which customers can switch retailers, and a process for dealing with the business failure of a retailer. (The costs of introducing competition-based reforms are considered in more detail in section 8.)

To what extent is there scope for competition and/or contestability in the different elements of the urban water supply chain?

What are the main impediments to competitive pressure developing (that is, why might it be difficult for new firms to enter the urban water market and provide goods and services)?

- *What is the nature of these impediments (that is, are they technical, regulatory, policy-related, or of some other nature)?*
- *Have these impediments lessened or increased over time?*

What benefits, costs and risks are associated with competition and contestability in the urban water sector?

- *Would the introduction of competition (for example, in bulk water supply) affect the economic viability of any existing water sector assets?*
- *How would security of supply be managed under more competitive market arrangements? Is there a need for 'provider of last resort' provisions in the event of a water or wastewater service provider failing?*

The Commission recognises that achieving contestability depends on a range of factors that vary across jurisdictions. In particular, the feasibility (and benefits) of introducing contestability might differ between metropolitan and regional urban areas.

Are the prospects for developing competition in the metropolitan urban water sector different from the regional urban water sector? If so, how?

Are there any impediments to competition that are specific to either the metropolitan or regional urban water sectors?

8 Tools and options for achieving reform

Case for reform

Although the urban water sector has made progress towards reform, there could be scope to achieve improved efficiency through further reforms in the structural, institutional, regulatory and other arrangements that govern the sector.

Is there a strong case for urban water reform to be pursued?

Can you provide any quantitative or qualitative evidence or analysis of the efficiency gains from reform that might be achieved in the Australian urban water sector?

Reform tools

Achieving efficiency gains is likely to require a package of reforms including changes to stated objectives and to governance, institutional, regulatory and structural arrangements. Establishing these arrangements has costs. The decision to proceed with reform therefore depends on how these costs compare with the expected benefits of reform.

Governance and institutional arrangements

Governance refers to the way that institutions make decisions and implement policies (APSC 2008). Good governance processes provide the framework within which agencies can operate effectively, based on principles of accountability, transparency, integrity and efficiency.

In Australia, water is generally managed on a jurisdictional basis. Although there is a national approach to some issues, each state and territory retains responsibility for policies and arrangements for the sector. Accordingly, the governance arrangements for water and wastewater tend to vary across jurisdictions.

An efficient governance framework should be guided by the following principles (PC 2010).

- Legitimacy — an agency has clear objectives and authority for its responsibilities.
- Transparency — decision making processes are visible, clearly communicated, and information about the performance of a governing body is accessible.

- Accountability — responsibility for decisions and actions is allocated and accepted, and it is possible to demonstrate how these responsibilities have been met.
- Inclusiveness — opportunities to participate in and influence decision making processes and actions are made available to stakeholders.
- Fairness — attention is given to stakeholders' views, personal bias is absent from decision making, and costs and benefits are considered in decision making.
- Integration — there is coordination across different levels of urban water governance, and there is alignment of priorities, plans and activities across governing bodies.
- Capability — the skills, leadership, experience, resources, knowledge, plans and systems enable organisations to deliver on their responsibilities.
- Adaptability — learning is incorporated into decision making and implementation, threats, opportunities and risks are anticipated and managed, and there is systematic reflection on individual, organisation and system performance.

In addition, the principle of efficiency should be used to assess governance arrangements. Efficiency is of particular importance where transaction costs or the existence of economies of scope result from a given arrangement.

Are the current governance arrangements for the urban water sector efficient?

- *What are the strengths of these arrangements?*
- *What are the weaknesses of these arrangements, and what are the consequences of these weaknesses?*

Is there a case to change the governance arrangements that apply in the Australian urban water sector?

The Australian urban water sector currently encompasses mostly publicly-owned, but also some private, institutions, namely:

- the Commonwealth Government (cabinet, ministries, secretaries and departments)
- state and territory governments (cabinet, ministries, secretaries and departments)
- national and state-based regulators to oversee economic regulation (consumer and/or access prices), public health regulation and environmental regulation
- government-owned water businesses (providing one or more water and/or wastewater service)

- privately-owned water businesses (providing one or more water or wastewater service)
- independent market manager/independent procurement entity (IPE) (to coordinate demand and supply, and/or facilitate supply augmentation)
- water ombudsman (to manage customer complaints)
- customer and community advocacy groups.

Are the current institutional arrangements in the urban water sector efficient? If not, what institutional reforms are required?

- *What institutions or combinations of institutions are most likely to support an efficient urban water sector?*
- *What governance arrangements should these institutions have?*
- *How should these arrangements be imposed, monitored and enforced?*
- *How should these institutions interact/coordinate?*

Should the same institutional arrangements apply in metropolitan and regional urban areas? Are special arrangements required for small settlements, including Indigenous communities?

What would be the benefits of institutional reform?

What would be the costs (administrative, compliance, one-off or ongoing) of introducing these institutional arrangements? How should these costs be met?

One measure that has been introduced to try to improve the performance and accountability of existing institutions is performance reporting for urban water utilities, at both a national and jurisdictional level.

Are existing performance reporting exercises effective in promoting improved performance and identifying problem areas? Could such reporting be made more effective?

Regulatory arrangements

To support the efficient operation of the institutions involved in the urban water sector, various regulatory mechanisms are required. Regulatory options that are commonly applied across Australia's urban water sector, and/or other network utility industries, include:

- economic regulation

- drinking water regulation
- wastewater management and recycled water regulation
- environmental health regulation
- building and planning regulation.

Economic regulation

In each jurisdiction, prices for urban water and wastewater services are set administratively, by either an independent economic regulator, jurisdictional or local governments, or a combination of these (box 6). While there is some variation across jurisdictions, independent regulatory arrangements may also cover customer service standards, market conduct and third party access.

Is there merit in having a single entity that administers prices for water and wastewater services in each jurisdiction?

Should independent price regulation be used more widely in the Australian urban water sector?

Is there merit in having a national approach to economic regulation of water and wastewater services?

Economic regulation also covers the terms and conditions on which third parties are provided access to monopoly water system infrastructure, including access prices, where this is relevant.

Certain consumer issues also fall within the scope of the economic regulator's role. The economic regulator may have responsibility for assessing whether water businesses comply with relevant minimum customer service standards. These standards are typically set out in a customer service code (or charter) that specifies the precise standards and conditions of service and supply that water businesses must comply with in providing regulated water and wastewater services.

Customer service codes generally contain a requirement for water businesses to have a hardship policy. By way of example, a hardship policy may require water businesses to (ESC 2006):

- provide alternative payment arrangements in accordance with a customer's capacity to pay including offering a range of payment options (such as flexible payment plans) or redirection of the bill to another person for payment
- offer to extend the due date for some or all of an amount owed

Box 6 Institutional arrangements for setting water and wastewater prices

- In NSW, the Independent Pricing and Regulatory Tribunal (IPART) sets prices for Sydney's (bulk and retail) water supply, wastewater and stormwater services. IPART also sets maximum prices for water and wastewater services supplied by Hunter Water Corporation, Gosford City Council, Wyong Shire Council and Country Energy (to its Broken Hill customers). For other parts of the regional urban water sector, the local water utilities set prices.
- In Victoria, the Essential Services Commission sets binding water and wastewater charges for all water (metropolitan and regional urban) businesses.
- In Queensland, the government sets bulk water charges according to a 10 year price path, and local governments set retail water and wastewater charges. The Queensland Competition Authority currently undertakes pricing investigations, pricing policy reviews, and price monitoring, but does not determine water and wastewater prices. However, the Minister for Natural Resources, Mines and Energy and Minister for Trade has advised that the regulatory arrangements from 1 July 2013 will be more comprehensive and will most likely be a price determination process.
- In Western Australia, urban water and wastewater charges are the responsibility of the Minister for Water. Western Australia's Economic Regulation Authority may be requested by the government to undertake pricing inquiries, and has an ongoing reference to undertake an annual review of Water Corporation tariff levels.
- In South Australia, urban water and wastewater prices are determined by the South Australian Government. However, the Government has committed to appointing the Essential Services Commission of South Australia as the independent economic regulator for monopoly suppliers of urban and regional water and wastewater services.
- In Tasmania, regulation of water and sewerage prices is undertaken by the Tasmanian Treasurer through an Interim Price Order. Independent economic regulation of water and wastewater services will commence in Tasmania from 1 July 2012.
- The ACT's Independent Competition and Regulatory Commission is responsible for determining the tariffs that ACTEW Corporation applies for the provision of water and wastewater services.
- In the Northern Territory, the Treasurer (Regulatory Minister) sets prices and may seek advice from the economic regulator, the Utilities Commission. The Utilities Commission is responsible for monitoring and enforcing compliance with pricing determinations.

Source: NWC (2009a); QCA (2010).

- appropriately refer customers to government funded assistance programs (including the Utility Relief Grant Scheme), or to an independent financial counsellor
- observe minimum periods of notice before applying supply restrictions or pursuing legal action to recover outstanding debts
- not restrict the water supply of a customer or pursue legal action unless having first taken additional steps to secure payment, including making a reasonable attempt to contact the person, offering a payment arrangement and resolving any dispute over the outstanding amount.

A water ombudsman — such as the Energy & Water Ombudsman (Victoria), or the Energy & Water Ombudsman (NSW) — provides an independent mechanism for managing customer complaints and resolving disputes. These industry-funded bodies are independent of government. As part of their licence obligations, water companies are required to participate in the ombudsman scheme.

In the event a provider of last resort scheme[1] is required by the Australian urban water sector (similar to the arrangements that apply in the Australian energy sector), administration of this type of scheme would likely fall to the relevant economic regulator.

Are the existing regulatory arrangements for protection of water customers — including hardship policies — effective? Are there improvements that could be made?

Drinking water regulation

Drinking water regulation is focused on protecting public health in relation to the supply of drinking water. To this end, the drinking water regulator might be responsible for:

- setting drinking water standards
- ensuring water businesses (and water supply schemes) comply with drinking water standards
- reporting on the performance of water businesses
- managing any breach of drinking water standards.

[1] A provider of last resort scheme is intended to maintain continuity of supply to customers' premises by requiring another water service provider to supply customers when their existing supplier is unable to do so.

The regulation of drinking water quality is managed on a jurisdictional basis by the relevant government department. The responsibilities of these departments and agencies is established in associated legislation. In all cases, the minimum standards for drinking water comply with the national Australian Drinking Water Guidelines.

Wastewater and recycled water regulation

A comprehensive set of arrangements (standards, codes and guidelines) are in place to manage wastewater and recycled water schemes in each jurisdiction. These regulations are specific to:

- on-site wastewater management and greywater (for example, greywater reuse guidelines and approval processes to install and operate septic tanks in new developments)
- all sewerage schemes regardless of proponent (for example, licensing of systems that involve the discharge or likely discharge of waste or by-products to land or water; use of effluent for irrigation guidelines)
- recycled water (for example, guidelines on planning recycled water schemes and final uses of recycled water).

A range of jurisdictional-based government agencies are involved in wastewater and recycled water regulation. For example, in NSW the relevant institutions include: NSW Health, Department of Water and Energy, Minister for Water, local councils, Environment Protection Agency, Department of Environment and Climate Change, and IPART.

Environmental health regulation

Jurisdictional agencies, such as the Environment Protection Authority in Victoria, or the Department of Environment and Resource Management (Environment) in Queensland, are responsible for setting environmental standards and monitoring the environmental performance of relevant individuals and organisations. This includes the protection of water systems and water environments from pollution.

In most jurisdictions, the relevant environmental regulator has a significant role to play in regard to the discharge of wastewater into the environment, and can intervene in cases of environmental pollution. Environment protection licenses are issued by these agencies and set operating and waste discharge limits for particular activities undertaken by water and wastewater businesses. These businesses may also be required to meet and report on a range of performance requirements set by the environmental regulator.

Building regulation and planning approvals

To the extent that any water system augmentation requires building and planning approvals, these regulations may be relevant for government and/or private investors. For example, parties seeking to build a new dam, construct a desalination plant, or take water out of an aquifer can expect to encounter various building and planning approval processes. In some cases, regulations may apply at both the state and Commonwealth level.

What type of regulatory arrangements are efficient for the urban water sector ?

- *At what point in the urban water supply chain should these regulations apply?*
- *What are the benefits and costs of these arrangements?*
- *Should the same regulatory arrangements apply in both metropolitan and regional urban areas?*

What is the appropriate role for government with respect to regulation of the urban water sector?

How should the scope and detail of the urban water regulatory framework be determined? By whom? What are the relevant considerations in setting this regulation?

Are the existing drinking water, wastewater and recycled water, environmental health and building and planning regulations efficient? Is the regulatory requirement too burdensome? Too weak? What are the costs and benefits of these regulatory arrangements?

Structural arrangements

Historically, the most common structural arrangement in Australia's urban water sector has been the vertically-integrated, government-owned monopoly. In recent years, steps have been taken by some state governments to reorganise the structure of the urban water sector. This has tended to focus on limited vertical disaggregation of the supply chain and, in some regional areas, replacing a number of small water service providers with one larger provider. However, in south east Queensland, and to some extent Melbourne, more substantial structural reform has been undertaken, as described in box 2.

Structural separation of potentially contestable elements of the urban water supply chain (such as bulk water procurement) from non-contestable elements (water and wastewater networks) has the potential — when combined with other reforms — to

encourage new entrants into the contestable areas of the market. Ultimately, this could lead to multiple businesses competing against each other for the provision of contestable services.

By contrast, splitting up a monopoly and divesting contestable elements of the supply chain into multiple entities might drive productivity improvements and greater customer choice, but duplicate some operating costs. Accordingly, it is necessary to look at the costs and benefits of different options on a case-by-case basis.

In regional areas, structural reform might take the form of amalgamating bodies and centralising functions in one entity to achieve economies of scale and scope (administrative and operational synergies). In some cases it may not be necessary to amalgamate entire organisations to enhance efficiency — for example, where local councils provide water and wastewater services, there might be efficiency benefits in merging the water service components of each council, without amalgamating the councils themselves. Indeed, this is the approach that has been pursued in Tasmania.

Is there a 'preferred' structural arrangement for the urban water sector?

- *Does this vary by jurisdiction?*
- *Does this vary between metropolitan and regional urban areas?*

What are the benefits and costs of undertaking particular structural reforms?

Urban water reform options

The Commission is seeking information and ideas about options for urban water reform. Reform options can be thought of as packages of governance, institutional, regulatory and structural arrangements that are expected to deliver net benefits to the Australian community compared with the status quo.

There is a broad range of possible options. Some focus on areas like price regulation and governance and can be implemented without major changes to institutions or the structure of the supply chain. Other options could involve significant changes to institutions and the structure of the supply chain, but only a subset of these entail greatly increased use of contestability and competition, and the creation of markets.

Solely for illustrative purposes, one reform option might involve retaining a vertically-integrated, government-owned regional water business, but devolving responsibility for achieving government objectives to an independent procurement entity (ERA 2008). Such an entity could seek proposals from the government water

business and the private sector for augmentation of future supply. Other features of this option might include:

- the government-owned water business paying dividends to its owner-government (in a competitive neutral way)
- removal of impediments to rural–urban water transfers
- urban water and wastewater prices being determined by an independent economic regulator
- introduction of a third party access regime that applies to monopoly network infrastructure.

Another illustrative option might be to move to a more disaggregated urban water supply chain and the creation of markets supported by competition. This option, which would be conceptually at the extreme end of the range of possible options, might extend to:

- suppliers competing to provide water services such as bulk harvesting, manufacturing, storage and treatment of water using a range of supply sources such as existing dams and storages, interconnected bulk water sources, and desalinated and recycled water supplies
- an independent market manager to coordinate supply and demand, subject to relevant market rules and regulatory and policy constraints
- water and wastewater retail competition
- a market for trade and exchange of water entitlements
- market-based, flexible water and wastewater prices
- a bulk water transport system operator, responsible for the management, operation and maintenance of bulk water pipelines and related infrastructure
- monopoly regional water and wastewater distribution network systems, subject to independent economic regulation, including regulated third party access, to facilitate competition in the bulk water, retail, and wastewater treatment/disposal markets.

What option(s) (that is, package of institutional, governance, regulatory and structural arrangements) would facilitate the urban water sector best meeting its objectives? What makes this option(s) superior to other possible options?

What costs and risks would be involved with this option? How would the costs be met and the risks managed?

What role would competition and/or contestability play in this option?

If the preferred option varies by jurisdiction or region, what are the key factors (for example, number of connections or number of bulk water supply sources) that are important in matching the option to the location?

9 Implementing reform

The terms of reference require the Commission to 'propose a work program including implementation plans' for the reform options identified.

What are the priority areas of reform (that is, where are the greatest efficiency gains evident and early action practicable)?

How important is the sequencing of reforms? Are there actions that need to be taken initially to prepare the way for later reforms?

What role should the Australian Government have in urban water reform? Should the Australian Government make financial payments to states and territories that reach reform milestones? If so, what would be the rationale for such payments? If not, is this because such payments might actually hinder efficient reform?

What quantitative and qualitative indicators should be used to monitor efficiency gains in the urban water and wastewater sectors?

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Attachment A: Terms of Reference

Productivity Commission Inquiry into examining the case for microeconomic reform in Australia's urban water sector

I, Nick Sherry, Assistant Treasurer, pursuant to Parts 2 and 3 of the *Productivity Commission Act 1998* hereby request that the Productivity Commission undertake an inquiry into examining the case for microeconomic reform in Australia's urban water sector.

Background

The urban water sector is responsible for providing sustainable, secure and safe drinking water and wastewater services. These services include: water harvesting; water manufacturing (e.g. desalination); storage; treatment and distribution; and wastewater removal and treatment. At times urban water utilities are also responsible for stormwater and flood mitigation services. Additionally, the sector has a role in encouraging the responsible use of water and water conservation. Urban water services are generally provided by state and territory government owned entities or by local councils.

In recent times, the ability of our urban water systems to meet demand for water in our cities and towns has been challenged by severe droughts, climate change, increasing urban populations and ageing water infrastructure. Ensuring long term water security requires effective arrangements that encourage timely investment in diversified water supplies and improve the efficiency of water use.

Reforms aimed at improving efficiency in the urban water sector began in the 1990s following the adoption of a water framework by the Council of Australian Governments (COAG) in 1994, which elevated better management of Australia's water resources to achieve positive social, environmental and economic outcomes to a national issue. Reform was further encouraged through the Intergovernmental Agreement on a National Water Initiative in 2004. In recognition of growing urban water supply challenges, the COAG national urban water reform framework was enhanced in November 2008.

While the urban water sector has made progress towards reforms, there is scope for further changes. This inquiry will assist COAG to advance urban water reforms in Australia by identifying pathways to achieve improved resource efficiency through reforms in arrangements that govern the urban water sector.

Scope of the inquiry

The Commission is to report within twelve months on:

1. Opportunities for efficiency gains in the structural, institutional, regulatory and other arrangements in the Australian urban water and wastewater sectors;
2. Options to achieve the efficiency gains identified in point 1. The options are to be subjected to a rigorous cost benefit analysis, including using quantitative assessments to the fullest extent possible, to identify:
    a. the economic, social and environmental impacts;
    b. the impacts on Australian governments, business and consumers; and
    c. the propensity to facilitate supply and demand planning and decision-making in the medium and long term.
3. A proposed work program including implementation plans for the options, identifying:
    a. practical actions that the Commonwealth, state and territory governments and local councils can undertake to implement options for reforms, including any transitional arrangements;

b. priority areas where greatest efficiency gains are evident and where early action is practicable; and

c. quantitative and qualitative indicators for efficiency gains in the urban water and wastewater sectors.

Considerations

In conducting the inquiry, the Commission is to have regard to:

1. A definition of urban that encompasses cities, towns and regional centres / villages;
2. The importance of long term water security — taking into account changes in climate, population and economic activity — without compromising social, health and environmental outcomes;
3. The roles of the Commonwealth and state and territory and local governments with respect to urban water and wastewater policy, supply and management;
4. The different circumstances across Australia, including:
    - Variability between water catchments, supply alternatives and demand;
    - Relationships between urban water users and other water users, including consideration of water resource planning and allocation frameworks;
    - Committed and planned investment to augment urban water supplies;
    - Current urban water reforms, such as planning, pricing and third party access; and
    - Emerging competition, including in the provision of water supply services.
5. Emerging water management practices, such as the integrated management of water, wastewater, recycled water and stormwater;
6. Lessons from reform in the rural water and natural resource management sectors and from overseas reform;
7. Lessons learnt from reforms in other utility sectors in the Australian economy. This should take into account differences in the intrinsic values of water compared to other products and operational differences between the industries, including product storage, availability, and transport costs;
8. The COAG 1994 reform outcomes, the national competition policy arrangements, the National Water Initiative provisions applying to urban water, the third party access provisions of the Trade Practices Act Part lIlA, competition and access regimes and the 2006 intergovernmental Competition and Infrastructure Reform Agreement; and
9. Current and recent review activity relating to urban water issues in Australia, including those undertaken by regulatory bodies.

In undertaking the inquiry, the Commission is to advertise nationally inviting submissions, hold public hearings, and consult with relevant Australian Government, state and territory government agencies, local government, water utilities, other key interest groups and affected parties.

The Commission is to provide both a draft and a final report. Both reports are to be published.

NICK SHERRY

[Received 22 July 2010]

Attachment B: How to make a submission

This is a public inquiry and the Commission invites interested people and organisations to make a written submission.

There is no specified format for a submission. Submissions may range from a short letter outlining your views on a particular topic to a more substantial document covering a range of issues. Where possible, you should provide evidence, such as relevant data and documentation, to support your views.

As this is a public inquiry, all submissions should be provided as public documents that can be placed on the Commission's website for others to read and comment on. Each submission will be published on the Commission's website shortly after receipt, and will remain there indefinitely as a public document. Copyright in submissions sent to the Commission resides with the author(s), not with the Commission.

Under certain circumstances the Commission can accept sensitive material in confidence, for example, if it was of a personal or commercial nature, and publishing the material would be potentially damaging. You are encouraged to contact the Commission for further information and advice before submitting such material. Material supplied in confidence should be provided under separate cover and clearly marked 'IN CONFIDENCE'.

Each submission should be accompanied by a submission cover sheet, which is available on the inquiry webpage and attached to this issues paper (attachment C). For submissions received from individuals, all personal details (including home and email address, phone and fax number) will be removed before it is published on the website for privacy reasons.

The Commission prefers to receive submissions as a Word (.doc) file attachment to an email. PDF files are also acceptable. To ensure your PDF is as electronically readable as possible, the Commission recommends that it is derived from word processing software (eg Microsoft Word or Lotus notes) and not from a scanner, fax or photocopying machine. Submissions can also be accepted by fax or post. All contact details are provided at the front of this issues paper and on the cover sheet.

Please ensure that the version sent to the commission is the final version and that you have removed any rack changes, editing marks, hidden text and internal links from submissions before sending to the Commission.

Please send submissions to the Commission by Friday 5 November 2010.

Attachment C

Productivity Commission
SUBMISSION COVER SHEET
(not for publication)

Australian Government
Productivity Commission

Please complete and submit this form with your submission to:

Urban Water Inquiry
Productivity Commission
LB 2 Collins Street East
MELBOURNE VIC 3165

or

By facsimile (fax) to:
Carole Gardner (03) 9653 2302
By email: urbanwater@pc.gov.au

Name:			
Organisation: (**individuals please write** *'self'*)			
Position:			
Street address:			
Suburb/City:		**State & P'code:**	
Postal address:			
Suburb/City:		**State & P'code:**	
Email address:		**Phone:**	
Mobile:		**Fax:**	

Please note:

- For submissions made by individuals, all personal details other than your name and the State or Territory in which you reside will be removed from your submission before it is published on the Commission's website.
- Copyright in submissions resides with the author(s), not with the Productivity Commission.
- Submissions will be placed on the Commission's website, shortly after receipt, unless prior contact has been made concerning material supplied in confidence, or to request a delayed release for a short period of time. **Submissions will remain on our website as public documents indefinitely.**

Please indicate if your submission:

☐ contains NO material supplied in confidence and can be placed on the Commission's website

☐ contains SOME material supplied in confidence (provided under separate cover and clearly marked COMMERCIAL IN CONFIDENCE, or PERSONAL IN CONFIDENCE)