Investigation into Water and Wastewater Service Provision in the Greater Sydney Region

Draft Report

INDEPENDENT PRICING AND REGULATORY TRIBUNAL
of New South Wales

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S9-14

ISBN 1 920987 39 8

September 2005

Request for submissions

Submissions are invited from interested parties. Unless confidentiality is sought, the submissions are generally available for public inspection at the Tribunal's offices and will be available on-line in PDF format from the time of processing of the submission until 3-4 weeks after the release of the final report of an inquiry. The Tribunal may exercise its discretion not to exhibit any submissions based on their length or content (containing material that is defamatory, offensive, or in breach of any law).

Submissions should have regard to the specific issues that have been raised. There is no standard format for preparation of submissions but reference should be made to relevant issues papers and interim reports. Submissions should be made in writing and, if they exceed 15 pages in length, should also be provided on computer disk in word processor, PDF or spreadsheet format.

Submissions from stakeholders must be received by 30 September 2005.

All submissions should be sent to: **Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Draft Report**
Independent Pricing and Regulatory Tribunal
PO Box Q290
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If you want your submission, or any part of it, to be treated as confidential, please indicate this clearly. The Tribunal may include in its publications a list of submissions received during the course of a particular review or inquiry. It may also refer to submissions in the text of its publications. If you do not want your submission or any part of it to be used in any one of these ways, please indicate this clearly. A request for access to a confidential submission will be determined in accordance with the *Freedom of Information Act* and *section 22A of the Independent Pricing and Regulatory Tribunal Act*.

Privacy

All submissions will be treated in accordance with the *Privacy and Personal Information Act 1998*. Any personal information you give us will not be reused for another purpose.

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1 INTRODUCTION AND OVERVIEW

The supply of water is a key issue for the greater Sydney area. Over the past 20 years, the demand for water in the region has regularly exceeded the current estimate of the long-term sustainable supply from existing infrastructure (the 'sustainable yield'). In addition, severe drought conditions in recent years have significantly lowered the levels of water supply storages throughout the area, and highlighted the need to address the issue of sustainable water supply and demand.

In October 2004, the NSW Government released its Metropolitan Water Plan for Sydney,[1] which sets out actions required over the next 25 years to ensure sustainable water supplies for Sydney. These actions involve addressing the balance between water supply and demand through a variety of responses, such as enhancing demand management programs, increasing the emphasis on water recycling, and securing additional water supplies. A key aim of the plan is to encourage the involvement of the private sector in developing innovative methods of service provision, particularly the provision of recycled water services. The Government is also developing a metropolitan strategy for recycled water, which aims to encourage the use of recycled water to replace potable water where feasible.

The Metropolitan Water Plan has important implications for the pricing of water and wastewater services, and for the structure of the water and wastewater industry in Sydney. Along with other factors – such as Services Sydney's proposal to enter the wastewater service market[2] – these implications have created an impetus to examine the merits of industry reform.

To provide some guidance for this process, the Government asked the Independent Pricing and Regulatory Tribunal of New South Wales (the Tribunal) to review and provide advice on pricing principles and alternative arrangements for the delivery of water and wastewater services in the greater Sydney region, including possible private sector involvement. It also asked the Tribunal to make recommendations for providing these services in the most efficient, effective and sustainable way. (See Appendix A for the full terms of reference.)

The Tribunal has completed the first stage of its review.[3] This Draft Report presents and discusses its findings and recommendations to the Government. The report's purpose is to provide an opportunity for all interested parties to comment on these findings and recommendations before the Tribunal makes its Final Report by 31 October 2005.

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1 NSW Government, *Meeting the challenges: Securing Sydney's water future, The Metropolitan Water Plan*, October 2004.

2 Services Sydney, a private sector firm, approached Sydney Water with a proposal to enter the wastewater service market. When the proposal was not successful, it pursued the matter with the National Competition Council and, more recently, the Australian Competition Tribunal. Under Services Sydney's proposal, it "would compete for retail customers in the provision of sewerage collection services, obtain sewerage transportation and interconnection services from Sydney Water, and then provide its own sewage treatment services and as a second element, supply bulk water for various purposes" (Services Sydney, submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region", May 2005).

3 In May 2005, the Tribunal released an Issues Paper for this review. The Tribunal subsequently received submissions from interested parties.

1.1 Reform in other industries and jurisdictions

Over the last two decades, many OECD countries have undertaken regulatory reforms that have fundamentally changed the scope for competition in regulated network industries. Through a combination of structural reforms and regulatory controls, industries previously served through vertically integrated regulated monopolies (like Sydney's water and wastewater industry) have been opened to competition. In telecommunications, electricity, natural gas, railways and postal services, new entrants are competing in parts of these industries that were previously closed to competition. The OECD (2001) suggests that, in most cases, this has resulted in clear benefits, including higher levels of innovation, customer responsiveness and productivity, and lower prices.[4]

In general, the experience in other jurisdictions suggests that, where it is feasible, competition encourages efficiency and innovation, and is preferable to regulation. More specifically, research into recent competitive market reform in Australia indicates that it has yielded net economic benefits.[5]

However, in the water industry, the introduction of competitive market reforms has lagged behind other utility sectors (such as energy), both in Australia and overseas. This means there is limited experience of competition in water services and hence, limited evidence to draw upon. Thus the debate in water is still about the *potential* efficiency gains achievable from reform.

What experience there is suggests that the benefits of increasing competition are more likely to be in terms of dynamic efficiency and innovation, than of productive or allocative efficiency (see Appendix B for an explanation of these concepts). For example, in the United Kingdom, legislation has been introduced recently with the aim of increasing market competition in both the privatised water industry in England and Wales and the publicly owned water industry in Scotland. The anticipated benefits include:

- Increasing choice of supplier for non-domestic customers (the competitive market has been limited to this market segment)
- More efficient use of water resources
- Greater innovation in the abstraction and treatment of water
- Greater innovation in services for customers.[6]

1.2 Overview of Tribunal's recommendations

Based on its review, the Tribunal considers that the potential benefits of increasing competition in Sydney's water and wastewater industry are also likely to be dynamic efficiency gains, including increased innovation and more efficient use of water resources. Given the current context, where the primary need is for innovation and the provision of new supply sources, it believes a series of competitive reforms should be introduced.

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4 OECD, *Restructuring Public Utilities for Competition*, Paris, Organisation of Economic Cooperation & Development, 2001.

5 ACIL-Tasman, *COAG Energy Market Reforms*, Report Commissioned by COAG Energy Market Review, December 2002.

6 DEFRA *Extending opportunities for competition in the water industry in England & Wales: Consultation Paper*, London, Department of Environment, Food and Rural Affairs, 2002.

Sydney Water's current prices do not reflect the cost of service provision by location. Prices are based on the average cost of supply, and are uniform throughout the region even though the cost of providing water services varies throughout the greater Sydney area. (This arrangement is sometimes referred to as 'postage-stamp pricing'.) Some alternative service delivery arrangements (for example, the disaggregation of Sydney Water), may involve a move away from postage-stamp pricing to more fully cost-reflective pricing. This would raise social equity concerns – for example, it could impact negatively on some customers, particularly low-income households.[7] In considering competitive reforms, the Tribunal has been mindful of the need to maintain equitable pricing of retail water and wastewater services.

The Tribunal is of the view that, given the limited experience of competition in water and wastewater, an adaptive management approach should be taken in pursuing the introduction of new arrangements. Rather than defining a preferred 'end state' for the industry, Government policy and industry arrangements should be allowed to evolve, as parties develop a better understanding of the value of water resources and the most efficient means of delivering services.

The Tribunal considered three main approaches for reforming Sydney's water and wastewater industry – including:

- increasing the scope for competition, private sector involvement and innovation in the industry through the greater and more effective use of competitive procurement by the incumbent water authorities
- further increasing this scope by enabling third party access to water and wastewater infrastructure
- restructuring the entire industry by disaggregating Sydney Water Corporation (Sydney Water).

It found that the primary focus should be on the first two approaches – making better use of competitive procurement and enabling third party access to infrastructure. These approaches will help create a more dynamic market in which private sector participants compete to identify opportunities to provide innovative water and wastewater services that meet customers' needs within an environment of increased water scarcity. Radical restructuring of the industry is not required to create such a market, and should not be undertaken, at least in the short to medium term.

In addition, the Tribunal found that its recommended reforms would necessitate a range of changes to the existing legal and regulatory framework for the water and wastewater industry, to remove barriers to competition and innovation, and to ensure the continued protection of consumers and the broader public interest.

The Tribunal's recommendations seek to create an environment in which it will be possible for the proponents of practical proposals to enter the water and/or wastewater market. In

[7] These social equity concerns could be addressed in a number of ways, including adjusting cost-reflective prices (for example, by retaining a degree of averaging, and thus uniformity, in prices), providing for non-distorting internal cross-subsidies (for example, lump sum transfers within or between regions), and/or providing for targeted subsidies to customer groups where cost-reflective retail prices raise concern for affordability. Also, price shocks from an immediate move to cost-reflective prices could be managed through rebalancing of prices over time.

this way, they complement the Tribunal's recent pricing determination, which set metropolitan water prices with reference to a rising Long Run Marginal Cost of water supply in line with Sydney's current water demand and supply balance.[8] Combined with the recommendations in this report, this pricing determination should increase the scope for the private sector to compete for the provision of some water and wastewater services.

An overview of the Tribunal's findings is presented below.

1.2.1 Making better use of competitive procurement practices

The Tribunal believes the first step towards opening up Sydney's water and wastewater market to greater competition should be to require the water authorities to make better use of outcomes-based competitive procurement practices. In particular, Sydney Water (and other water authorities operating in the Greater Sydney metropolitan area) should be required to make greater use of competitive sourcing to procure additional water supplies. This approach involves the water authority clearly defining the outcome it seeks to achieve (such as a certain quantity of water for a particular use at a particular location) then calling for proposals from potential providers to deliver this outcome – without prescribing the delivery approach.

To assist the governance of competitive sourcing arrangements, the Tribunal recommends that Sydney Water (and other water authorities in the Greater Sydney metropolitan area), internally separates its competitive sourcing activity from the rest of its operations.

In addition, Sydney Water should also be required to consider whether more innovative, outcomes-based procurement approaches such as competitive sourcing could be applied to other aspects of its service delivery (such as wastewater management), and whether the scope of its current competitive procurement program could be expanded.

1.2.2 Introducing open access to infrastructure

The Tribunal believes the second step towards opening Sydney's water and wastewater industry to greater competition should be to introduce open access to infrastructure. New entrants should be permitted to seek access to monopoly water infrastructure to inject water and compete in retail services, initially for large customers. They should also be permitted to seek access to wastewater infrastructure to withdraw wastewater for treatment and sell retail wastewater services, again initially to large customers. The extension of open access competition to other customers should be considered once experience has been gained, and a greater understanding of the potential for competition has been reached.

To best support the Government's objective to increase the efficiency, effectiveness and sustainability of water and wastewater service delivery, the access regime should be:

- State-based, to provide the efficiency of a single regulator for pricing and service standards (the Tribunal), and maintain a simple and flexible process.

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8 Independent Pricing and Regulatory Tribunal, *Sydney Water Corporation, Hunter Water Corporation, Sydney Catchment Authority – Prices for Water Supply, Wastewater and Stormwater Services - Final Report and Determination – From 1 October 2005 to 30 June 2009 for SWC and SCA, From 1 November 2005 to 30 June 2009 for HWC*, September 2005.

- Initially based on a negotiate-arbitrate model, and a future review point should be established to assess the adequacy of the access arrangements and the need for more detailed regulation.

1.2.3 Pricing infrastructure access

To support the preservation of the current postage stamp pricing arrangements and the implementation of a relatively simple and inexpensive approach to facilitating access, the Tribunal recommends that access to water and wastewater infrastructure be priced according to the Efficient Component Pricing Rule (ECPR).

The price paid for infrastructure access will be a major determinant of the success of open access in creating a more competitive market for water and wastewater services. While the Tribunal believes a (state-based) negotiate-arbitrate access regime should be established, it recommends that negotiations be constrained by specific access pricing principles, to ensure no single access agreement impinges on the feasibility of future access schemes.

The Tribunal assessed three possible approaches for determining access prices:

- using the long run marginal cost (LRMC) of access and consumption
- the average cost allocation, or building block methodology
- the Efficient Component Pricing Rule (ECPR).

The Tribunal's preferred approach is the ECPR methodology. The Tribunal prefers the ECPR approach, largely based on the retail pricing outcomes it yields. Another advantage is that it can be implemented in the absence of information about the unbundled costs of Sydney Water's services. Because retail prices will continue to be regulated, use of the ECPR will not result in monopoly rents for Sydney Water.

1.2.4 No major industry restructuring, at this time

Based on its analysis of the information and evidence currently available to it, the Tribunal believes disaggregating Sydney Water horizontally has the potential to provide opportunities for productive efficiency gains. However, as it cannot be reasonably confident that that the benefits would outweigh the costs, it considers there is insufficient justification to pursue this approach at this stage. In addition, given that Sydney's most pressing problem at present is water scarcity, it seems more appropriate to focus efforts and available resources on improving the dynamic efficiency of the industry, which can help to address this problem.

The Tribunal also considered whether the horizontal disaggregation of Sydney Water might to be used to ensure that the Growth Centres Commission water authority operates at an efficient scale (this would involve transferring assets, functions and customers from an existing Sydney Water service area to the new water authority, effectively disaggregating Sydney Water and creating two similar sized water authorities for the greater Sydney area). It found that while this approach could be used to help achieve a financially viable Growth Centres Commission water authority, several complex issues would need to be addressed. A 'River-Ocean' (or East-West) split of the greater Sydney area would mean that the newly formed businesses would have significantly different cost structures, which would have implications for pricing and cost recovery. Under a 'North-South' split, the cost differentials

between the two businesses would be lower, but the technical issues would be more complicated as major infrastructure would need to be shared between the North and South businesses.

In addition, the Tribunal considered whether Sydney Water could be 'unbundled' vertically to aid the development of open access competition. It found that, while this approach has been used successfully in other industries where open access has been introduced, it is not warranted at this time.

1.2.5 Removing barriers to competition, private sector participation and innovation

To support the development of a dynamic market for water and wastewater services, the Tribunal believes certain aspects of the existing legal and regulatory arrangements for the industry need to be changed. These changes include:

- Improving arrangements for the collection and dissemination of information about the water and wastewater market, to better support private sector participation and innovation
- Establishing property rights for all water resources, to encourage innovative services using alternative water sources
- Ensuring that clear and robust guidelines and rules are in place for recycled water, to facilitate the matching of water quality to end use
- Ensuring that environmental impacts are adequately accounted for and factored into decision-making.

1.2.6 Ensuring continued protection of consumers and the broader public interest

Experience in other industries suggests that the introduction of competitive reforms is likely to necessitate change in the existing legal, regulatory and policy framework, to ensure that this framework continues to provide adequate protection to consumers and to the broader public interest. Even when private sector players enter Sydney's water and wastewater market, and a variety of new services are on offer, the Government will retain ultimate responsibility for providing this protection and generally ensuring that the community's economic, social, health and environmental needs are met.

The Tribunal believes the following steps should be taken to ensure this continued protection:

- the prices of services to both small and large customers should continue to be regulated and the need for this regulation should be reviewed when a third-party access framework is established and competition in the provision of services to large customers emerges
- the legal and regulatory framework should be reviewed to ensure appropriate obligations are placed on incumbents and new entrants in relation to security of supply, water quality, environmental impacts, developing, maintaining and extending water and sewerage services, customer contracts and managing emergencies and matters of national security.

1.2.7 Implementing regulatory change

The Tribunal believes an 'adaptive management' approach to regulatory change is likely to be most effective, given the limited experience of competition in the water and wastewater industry. This approach would involve first establishing a set of basic principles and features for the revised regulatory framework, and using the principles to guide and direct short-term decisions made under the existing framework. The next step would be to use the principles and features to guide a review of the existing framework and the subsequent development of a revised regulatory framework that is robust, flexible and overarching.

The Tribunal has developed a set of basic principles guiding short-term decision making, and considered the additional principles, features and characteristics that should guide the development of the revised regulatory framework.

1.2.8 Managing the reform process

If the Government decides to accept the Tribunal's recommendations, their implementation will involve significant change to the market for water and wastewater services in the Greater Sydney area, and to the regulatory and other arrangements for these services. Experience in other industries suggests that the effectiveness of this type of reform depends significantly on the approach to implementation. For instance, establishing clear commitments and timelines for change can minimise the risks of regulatory uncertainty, stifled innovation and investment, or inappropriate investment and risk allocation.

Given the large number of government agencies with some responsibility for water services, the Tribunal believes a central implementation unit should be established. This unit should report to a Cabinet Committee, and be accountable for co-ordinating the involvement of government agencies and industry players, reviewing proposals before they are recommended to government, and monitoring progress. It should be established for a period of one year, initially, and be tasked with achieving specific milestones. Implementation should proceed in accordance with a pragmatic approach and timetable, which recognise the magnitude of potential improvements that may be gained, the relative ease of effecting change, and a logical sequencing of decisions.

1.3 The Tribunal's recommendations

The Tribunal's specific recommendations to the NSW Government are set out below.

Recommendation 1

That the Government require water authorities in the Greater Sydney metropolitan area to use competitive sourcing to procure additional water supplies.

Recommendation 2

That the Government require each water authority in the Greater Sydney metropolitan area to separate its competitive sourcing activity from the rest of its operations.

Recommendation 3

That the Government require Sydney Water to consider using more innovative, outcomes-based competitive procurement in other areas of service delivery, and expanding the scope of its current competitive procurement program in general.

Recommendation 4:

That the Government establish a state-based access regime for water and wastewater infrastructure, and that the regime is initially based on a 'negotiate and arbitrate' model.

Recommendation 5:

That the Government incorporates the Tribunal's recommended framework in the access regime. This framework comprises:

1. *A regulatory mechanism that enables:*
   - (a) *designated people, who could be:*
     - *any person,*
     - *a market participant, or*
     - *a prospective users*
   - (b) *to seek access to all water and wastewater infrastructure:*
     - *that may be specified at the inception of the access regime, or*
     - *that meets certain criteria (based on the current Trade Practices Act 1974 tests).*
   - (c) *Contracting freedom for the access seeker and asset owner, provided system integrity, operation, health, etc not jeopardised*
     - *Also, possibly, a statutory contract override mechanism if the Tribunal considers contracts to be inconsistent with the Tribunal's regulatory guidelines on access pricing*
   - (d) *The access seeker and asset owner subject to arbitration by the Tribunal if agreement cannot be reached*
   - (e) *regulatory guidelines or other instrument to be prepared by the Tribunal that:*
     - *set out its interpretation of relevant infrastructure asset tests that will be used in deciding whether or not assets should be subject to access*
     - *establish relevant pricing principles that should be applied in calculating access prices*
2. *A request or requirement for Sydney Water (and possibly any other access provider) to publish indicative access prices and services.*
3. *A possible contract monitoring program (under which the Tribunal would monitor and audit the access prices in access agreements entered into).*
4. *A future review point for the Tribunal to assess adequacy of access arrangements/regulation (including the scope for extending access-based competition to smaller customers), and inform Government of findings*

Recommendation 6:

That access to water and wastewater infrastructure be priced according to the Efficient Component Pricing Rule (ECPR).

Recommendation 7:

That the Government not undertake structural disaggregation of Sydney Water, at this time.

Recommendation 8:

That the Government review current legal and regulatory arrangements to identify all statutory impediments to private sector involvement and competition in Sydney's water and wastewater markets, and, where warranted, remove these impediments.

Recommendation 9:

That the Government improve arrangements for the collection and dissemination of information about the water and wastewater market to better support private sector participation and innovation, and that the Tribunal have regulatory oversight of information arrangements.

Recommendation 10:

That the Government establish property rights for sewage and stormwater, and consider establishing property rights for the injection and withdrawal of water from storage facilities such as natural aquifers.

Recommendation 11:

That the Government ensure that clear and robust guidelines and rules are in place for all potential sources and applications of recycled water, including for:

- *the harvesting and use of urban stormwater*
- *the use of recycled water for a range of key industrial applications*
- *the use of grey water at both the household level and for larger scale applications and uses.*

Recommendation 12:

That guidelines and regulations for the use of recycled water be subject to ongoing review and development to ensure that they are comprehensive, clear and outcomes-focused and that they keep pace with the evolution of the market.

Recommendation 13:

That the Government develop guidelines for valuing environmental impacts associated with the provision of water services in Sydney, and require that these guidelines be applied across all decision makers and government agencies (including DEC, DIPNR, IPART and Sydney Water).

Recommendation 14

That the prices of water, wastewater and other related services to small customers continue to be regulated by IPART.

Recommendation 15

That where regulated services are not provided by a government agency, the legal basis for price regulation be established.

Recommendation 16

That the prices of water, wastewater and other related services to large customers continue to be regulated, but reviewed if an infrastructure access framework is established and competition for provision of services for large customers emerges.

Recommendation 17:

That the Government ensure appropriate regulatory obligations are placed on incumbents and new entrants to protect consumers and the public interest in relation to ensuring security of supply, ensuring water quality, managing environmental impacts, developing, maintaining and extending water and sewerage services, addressing potential effects on customer contracts, and allocating responsibility for managing emergencies and national security matters.

Recommendation 18:

That the Government adopts the Tribunal's suggested basic principles for the revised policy and regulatory framework, and use those principles to guide and direct:

- *short-term decisions in the water and wastewater industry made under the existing framework*
- *a comprehensive review of the existing framework and subsequent development of the revised regulatory framework.*

Recommendation 19:

That the Government, in reviewing the existing framework and developing the revised legal regulatory framework, also take into account:

- *principles of best practice regulation*
- *national competition reform principles*
- *desirable features and characteristics such as consistent application throughout the state; clear principles for decision-makers; flexibility and adaptability to apply readily to any new entrant; seamless application to all activities and functions; and provision for exceptions that are in the public interest*

Recommendation 20:

That the Government establishes a central agency for one year, initially, which will report to a Cabinet Committee and be accountable for co-ordinating implementation of reform and reviewing and monitoring progress.

Recommendation 21:

That the Government develops an implementation plan that includes a clear vision for reform, an outline of the immediate next steps and appropriate sequencing for subsequent areas of work.

Recommendation 22:

That the Government progresses implementation in accordance with a pragmatic approach and timetable that recognises the magnitude of potential improvements that may be gained, the relative ease of effecting change, and a logical sequencing of decisions.

1.4 Structure of this report

The following chapters discuss each of the components of the Tribunal's proposed competitive reform program in detail:

- Chapter 2 discusses some the key strategic issues the Tribunal took into account in considering the options for industry reform and forming its recommendations
- Chapters 3 and 4 set out the Tribunal's findings and recommendations in relation to making better use of competitive procurement practices and introducing open access to infrastructure
- Chapter 5 looks at the various options for pricing access to infrastructure, and explains why the Tribunal prefers the ECPR approach
- Chapter 6 sets out the approaches to and goals for disaggregating Sydney Water, and explains the Tribunal's analysis and conclusions on each
- Chapters 7 and 8 discuss the legal and regulatory changes required to remove the barriers to competition and innovation, and to ensure the continued protection of consumers and the broader public interest
- Chapters 9 and 10 set out the Tribunal's findings and recommendations in relation to the approach to regulatory change and the management of the reform process.

The Tribunal particularly seeks comments on the recommendations made in this report. However, it also welcomes submissions on all issues relevant to the review and the assessment of potential options for water and wastewater service delivery. Details on how to make submissions are provided at the front of this report (opposite the table of contents).

2 THE TRIBUNAL'S APPROACH TO THIS REVIEW

In forming its recommendations, the Tribunal considered the submissions from and consultations with stakeholders, the experience in other industries and jurisdictions, and the findings of its own extensive analysis. It also took into account a number of important strategic issues, which affect the feasibility of some of the options it considered. These issues include:

- community attitudes to the use of recycled water
- the arrangements for service provision in new growth areas of Sydney.

Each of these issues is discussed below.

2.1 Attitudes toward recycled water use

Research commissioned by the Department of Utilities, Energy and Sustainability[9] suggests that while the community generally supports the idea of using of recycled water for non-potable purposes, there is currently a high degree of discomfort with the concept of recycling water for potable uses. Recycling wastewater for re-injection back into the potable water supply system would require community support for, and acceptance of, such a change. International experience suggests that long lead times are required to achieve this and even then the volume of recycled water relative to non-recycled water is typically limited.

While tertiary treated effluent is discharged into the rivers supplying water in many parts of the world, recycled water is generally not fed directly back into the potable water supply. Singapore currently undertakes indirect potable reuse, blending recycled water with the water in its reservoirs. At present only one percent of daily usage is recycled water, and this is expected to rise to only 2.5 per cent in the future.

The Tribunal recognises the Government's view that there is currently limited public acceptance of the recycling of wastewater for potable uses. While public opinion can shift over time, the Tribunal acknowledges that community attitudes toward recycled water will limit recycled water use to replacing potable water where it is not being used for drinking purposes. However, preliminary estimates suggest that the level of recycled water use may reach around ten per cent of the current estimate of the sustainable yield from existing water storages. Displacing this amount of potable water use would go a long way to meeting the requirement for drinking water of the growing population in the Greater Sydney area.

2.2 Water and wastewater service provision in new growth areas

The Government is undertaking a program of initiatives to address forecast growth in the Greater Sydney metropolitan area. Planning is being undertaken for around 23,500 dwellings per year. Growth precincts of around 6,000 to 9,000 dwellings will be progressively released to give a total of 100,000 new dwellings in the South West, and 60,000 dwellings in the North West over the next 25 to 30 years.[10]

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9 UMR Research PTY Ltd, "*Community Attitudes to Water Supply in Sydney*", July 2005.

10 Plan for Managing Sydney's Growth Centres – Sydney Metropolitan Strategy – Department of Infrastructure, Planning and New Resources (DIPNR) 2005.

A Growth Centres Commission is being established under the *Growth Centres (Development Corporations) Act (1974).*[11] The Commission's role is to coordinate the orderly rollout of land release and infrastructure, so it has a direct bearing on the provision of water and wastewater services in the growth areas. The Commission is also to be established as a water supply authority under the provisions of the *Water Management Act 2000*. The Government has stated that it will be issued with an operating licence, which will be subject to audit by the Tribunal.[12]

In addition, the Western Sydney Recycled Water Initiative will be undertaken under the Metropolitan Water Plan. This initiative aims to achieve recycling of up to 80 billion litres of wastewater each year from the new growth centres and surrounding areas in Western Sydney by 2029. Detailed engineering and environmental investigations have been commissioned by the Government to develop a recycled water strategy, and have confirmed that 80 billion litres of wastewater can be provided from a combination of the existing treatment plants in Western Sydney and new plants to be built to service the new growth areas. The Growth Centres Commission will be directed to implement stage one of the Western Sydney Recycling Initiative.[13]

The Government has identified potential for Public Private Partnerships (PPPs) for the design, delivery and possibly the operation of infrastructure servicing the new growth areas. On 11 June 2005, the Premier announced that the Government had decided to seek expressions of interest in the delivery of the Western Sydney Recycled Water Initiative.[14]

11 Managing Sydney's Growth Centres, NSW Government Metropolitan Strategy, 2005.
12 Ibid.
13 Ibid.
14 Announcement made by Premier at 2005 NSW State Labor Party Conference.

3 MAKING BETTER USE OF COMPETITIVE PROCUREMENT PRACTICES

Based on the findings of its review, the Tribunal believes the first step towards opening up Sydney's water and wastewater market to greater competition should be to require the water authorities to make better use of outcomes-based competitive procurement practices. In particular, Sydney Water (and other water authorities operating in the Greater Sydney metropolitan area) should be required to make greater use of competitive sourcing to procure additional water supplies. This approach involves the water authority clearly defining the outcome it seeks to achieve (such as a certain quantity of water for a particular use at a particular location) then calling for proposals from potential providers to deliver this outcome – without prescribing the delivery approach.

More generally, Sydney Water should also be required to consider whether more innovative, outcomes-based procurement approaches such as competitive sourcing could be applied to other aspects of its service delivery (such as wastewater management), and whether the scope of its current competitive procurement program could be expanded.

The Tribunal's findings and recommendations in relation to competitive sourcing of additional water supplies and Sydney Water's general approach to competitive procurement are discussed in detail below.

3.1 Use competitive sourcing to procure additional water supplies

The Tribunal's review indicates that the use of competitive sourcing to procure additional water supplies has the potential to increase the level of competition and innovation in Sydney's water and wastewater industry. This approach has been used successfully in other industries to create opportunities for new players to participate in the industry and strengthen incentives for innovation. It can be implemented in Sydney's water industry without significant change to the current industry structure. Therefore, it is a logical first step towards opening the industry up to competition. It also provides a logical transition path towards higher levels of competition, such as establishing an open access regime (discussed in Chapter 4). In addition, it is consistent with the Tribunal's adaptive management approach to reform of the water industry (discussed in Chapter 1).

The following sections provide more detail on:

- what is meant by competitive sourcing
- the experience with this approach in other jurisdictions and industries
- the potential benefits of requiring Sydney's water authorities to make greater use of competitive sourcing to procure additional water supplies
- the key issues that would need to be addressed to implement this approach.

3.1.1 What does competitive sourcing mean?

The term 'competitive sourcing' covers a wide range of approaches. However, in the context of this review, the Tribunal uses it to mean competitive procurement of a clearly defined service outcome where the processes or approaches to be used to deliver this outcome are not specified in detail. To use competitive sourcing to procure additional water supplies, a water authority would define the outcome it seeks – for example:

- supply of a certain volume of bulk water for potable use, at a particular location and for a particular time period
- supply of a certain volume of bulk water for non-potable use, at a particular location and for a particular time period
- supply of 'end use' water to a new population centre of 20,000 households, with the flexibility for the solution to include a combination of potable water and non-potable water, subject to this solution being acceptable to customers and being in compliance with health and environmental requirements.

It would then call for proposals to deliver this outcome, and leave it to potential providers to identify how this can be done. In response, one private sector proposal may, for example, involve large-scale sewer mining, treatment and the provision of distribution infrastructure to provide non-potable water for industrial, irrigation and/or environmental use. A water authority may also develop its own proposal in-house or in conjunction with other Government agencies, and evaluate this proposal alongside those submitted by private sector firms. The evaluation process would seek to identify the proposal that represents the most efficient, effective and sustainable means of delivering the outcome.

Competitive sourcing differs significantly from Sydney Water's current competitive procurement arrangements. Under these arrangements, the water authority (often in conjunction with other Government agencies) determines the approach to be taken to deliver the required outcome and plans a project to implement this approach, which can include specifying the details of the engineering solution required. It then competitively procures various inputs to the project, or tenders for private sector provision of the entire project (eg, via a build-own-operate or build-own-operate-transfer scheme). Typically, it is also responsible for sourcing the water or wastewater resource (or prescribing the means by which this will occur) and prepares a contract specifying the details of the plant to be constructed and how it is to be operated and so on.

The current approach can produce a level of competition that minimises the cost to Sydney Water and exposes it to a range of technological options.[15] However, greater use of competitive sourcing can facilitate a much greater level of private sector innovation in the supply of water resources and thus increase the potential for efficiency gains.

For example, under the current approach, to realise the objective of an increase in water supply, a water authority (probably in conjunction with other Government agencies) may decide on a particular project (eg, building a pipeline so that water can be pumped from a dam outside the metropolitan area) and call for bids to construct this specific infrastructure. Under a competitive sourcing approach, it would call for bids for bulk water supply, and let the 'market' come forward with proposals for delivering this outcome, without placing

[15] For example, see discussion on page 1 of Chapman R & Cuthbertson S, "Sydney's Water – A Suitable Case for Private Treatment?", *Public Policy for the Private Sector*, Note No.80, April 1999.

unnecessary constraints on the delivery approach. It might then receive proposals that include a range of options for achieving the outcome – such as pumping water from other locations/storages, constructing a desalination plant, establishing sewage recycling schemes (for non-potable use), capturing and reusing stormwater (for non-potable use), or re-configuring existing infrastructure (eg, storages, pumping stations) to increase capacity.

In evaluating the alternative proposals, the water authority would seek to identify the most efficient, effective and sustainable means of delivering the required outcome. The issues it might consider include the cost-effectiveness of proposals, the reputation and track record of the potential providers, the risks associated with the proposed technology, environmental and health requirements and objectives, the appropriateness and reliability of the proposed water source, and the extent to which it can be confident about the timing and delivery of outcomes.

3.1.2 Experience in other jurisdictions and industries

Competitive sourcing techniques have been used in other utility sectors for a long time. For example, in the electricity sector, it is common practice in other countries and in some States in Australia for a utility to define future electricity supply requirements and then call for tenders, leaving it up to potential providers to define the details of the proposed fuel supply, generation technology, location, and procurement processes, etc.

In the water sector, competitive sourcing of water supplies is being adopted in a limited way in Western Australia (see Box 3.1). The success of this approach appears to depend on clearly defining the outcomes required, and ensuring sufficiently long lead times for potential providers to discover, assess and develop a range of possible options.

Singapore's national water agency, the Public Utilities Board (PUB), has recently moved to a "Best Sourcing" approach to contracting with the private sector for the provision of water services. To date, this has involved engaging the private sector in Design-Build-Own-Operate (DBOO) arrangements for a recycled water plant (at Ulu Pandan) and a desalination plant (at Tuas). Under these arrangements, PUB specifies its performance requirements (i.e. water quantities and qualities required for indirect potable use and industrial use), leaving it up to the private sector to determine the most efficient way to design, build and operate the plant to meet these requirements. The "Best Sourcing" approach in relation to the Ulu Pandan recycled water plant is discussed further in Box 3.1.

The Tribunal also notes that the NSW Government has introduced an outcomes-based approach to other areas of water policy. For instance, the Government's recently announced Demand Management Fund will provide $30 million per annum to the most efficient water conservation programs put forward by businesses and Councils, which is in addition to existing programs for business demand management already provided by Sydney Water.[16] BASIX (the Building Sustainability Index) requires that all new residential dwellings meet the NSW Government's target of a 40 per cent reduction in water consumption, without prescribing how this should be achieved (that is, it is left up to the 'market' to determine the most efficient means of achieving this outcome).

16 NSW Government, *Meeting the challenges: Securing Sydney's water future, The Metropolitan Water Plan*, October 2004, p 16.

Box 3.1 Source development proposals in Western Australia and 'Best Sourcing' in Singapore

Source development proposals in Western Australia

In addition to the options proposed in its Source Development Plan, the Water Corporation in Western is considering a range of other potential water sources and augmentation activities, including those put forward by independent parties.[17] To date, it has received and considered several proposals from the private sector.[18] Its key considerations in assessing these projects include:

- cost-effectiveness
- social and environmental impacts
- the speed that potential sources can obtain the required approvals
- reliability of the water source
- certainty of the project based on complexity and the degree to which planning, investigation and approval has been advanced.[19]

"Best Sourcing" water services in Singapore

Currently, there are three existing NEWater plants in Singapore, with a combined production capacity of 96,000m^3/day ('NEWater' is recycled or reclaimed water, which is used for indirect potable and industrial purposes). Two of these plants were delivered through the 'build to design' delivery concept. This involves the engagement of consultants to develop the detailed design of the NEWater plants, followed by the engagement of contractors to build the NEWater plants in accordance with the design. To leverage on the innovation of the private sector, the third NEWater plant was designed and built by the contractor. Such a design and build package enhances the synergy of the design and construction processes.

With experience gained from these three plants, Singapore's Public Utilities Board (PUB) has moved a step further with the fourth NEWater plant by adopting a "Best Sourcing" approach, which structures the project based on a Design-Build-Own-Operate (DBOO) arrangement. It is thought that such an approach will provide even greater scope for synergies (in design, construction and maintenance) and private sector innovation.

In January 2005, PUB entered into a 20-year NEWater agreement with Keppel Seghers NEWater Development Co Pte Ltd (Keppel Seghers). Under the agreement, Keppel Seghers will design, build, own and operate Ulu Pandan NEWater plant and sell reclaimed water to PUB for indirect potable and industrial use. Keppel Seghers' main obligation is to produce water which meets the product water qualities specified in the agreement, at the warranted capacities of 116,000m^3/day for indirect potable water and 46,000m^3/day for industrial water. PUB's obligation is to provide feedwater in the form of secondary treated effluent (which meets the quality specifications). In order to give the public assurance that the qualities of both these types of water, produced by a private company, will not be compromised, a comprehensive monitoring and audit system will be put in place to allow PUB to regularly check on the water quality and operation and maintenance of the plant.[20]

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17 Economic Regulation Authority, *Inquiry on Urban Water and Wastewater Pricing – Draft Report*, Western Australia, March 2005, pp 38-41.

18 ibid Appendix 5, pp 187-189. Proposals received include: United Utilities Australia to meet the potable water needs of the Goldfields by desalinating seawater in Esperance and transporting it via a pipeline to Kalgoorlie-Boulder; Agritech Smartwater has proposed a scheme to supply potable water to the Water Corporation based on the desalination of water from Wellington Dam; Tenix Group has proposed a scheme to transport water from the Fitzroy River to Perth by means of a 3,700 km canal.

19 A 'certainty rating' has been developed ranging between high and low to guide as a guide to the level of project progression.

20 Siong Teck and Hian Hai, "Ulu Pandan NEWater – Design Build Own and Operate (DBOO) Project", paper presented at the 1st IWA-ASPIRE Conference and Exhibition, Singapore, July 2005.

3.1.3 Benefits of competitive sourcing

The Tribunal's review of the use of competitive sourcing in other industries and jurisdictions suggests that its greater use in Sydney's water industry can potentially provide a range of benefits. For example, it could:

- Help to create a more dynamic market by providing an opportunity for new parties to be involved in the industry, and strengthening incentives for innovation by focussing on outcomes and price (rather than on the detailed inputs and costs of supply).
- Expose greater information about the economics of various supply and service options, thereby facilitating a more optimal use of water resources.
- Allow the water authority and Government to focus on managing risks, uncertainties and trade offs that need to be considered in planning.
- Potentially increase the diversity of supply options, and thus make the management of security of supply more robust.

By calling for proposals to deliver the required outcomes (rather than prescribing the specific delivery approach), competitive sourcing can allow the least-cost combination of measures required to provide additional water supplies (and meet health and environmental requirements) to be 'discovered'. It provides incentives for potential service providers to identify and solve the economic and technological challenges to exploiting water and wastewater resources and providing water services.

Requiring Sydney's water authorities to make greater use of this approach to procure additional water supplies recognises that the market for water services is evolving – in response to the increasing scarcity and cost of water from conventional sources, and technological developments (such as new treatment technologies and methods of hydraulic, hydrological and geo-hydrological management), which are increasing the scope for alternative sources of water via, for example, water reclamation and water recycling schemes.[21] This market evolution makes it difficult for any one agency to prescribe the most efficient and effective means of providing water services, and also increases the scope for competitive sourcing of water services.

The stakeholders who commented on the use of competitive sourcing in submissions to the Tribunal's review appear to support the Tribunal's recommended approach. For example, PIAC noted that competitive sourcing "could draw on the principles of the Electricity Demand Management Code of Practice, in which businesses identify constraints or demand and supply imbalances and seek tenders for solutions." It also noted that the benefit of competitive sourcing is that it retains the existing industry structure, therefore minimising the transaction costs and risks associated with industry reform.[22]

AGL put the view that a "considered evolutionary approach" to reform of Sydney's water industry is preferable, and that the "establishment of a policy and commercial environment which facilitates greater private sector involvement in the provision, management and

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21 CSIRO, *Wastewater Re-use, Stormwater Management and the National Water Reform Agenda*, CSIRO Land and Water Research Position Paper 1, Report to the Sustainable Land and Water Resources Management Committee and to the Council of Australian Governments National Water Reform Task Force, 1997.

22 Public Interest Advocacy Centre (PIAC), submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region", June 2005.

operation of infrastructure for water services (including water reclamation and recycling), should be the first priority."[23]

3.1.4 Implementation issues

The Tribunal has not identified any significant barriers to increasing the use of competitive sourcing for procuring additional water supplies – either in the existing Sydney Water service area or in the new growth areas.[24] This approach can be implemented within the current industry structure. It can also be implemented in a way that is consistent with an adaptive management approach to industry reform. For example, Sydney Water could initially use the competitive sourcing approach to meet some of its required service outcomes, while continuing to develop its own project proposals to meet others. Also, when using the competitive sourcing approach, it could develop its own proposals, and evaluate these alongside those it receives from potential private sector players. [25]

However, appropriate methodologies, analysis tools and commercial processes would need to be developed to support competitive sourcing. The implications for governance and regulatory arrangements would also need to be addressed.

Developing appropriate methodologies, analysis tools and commercial processes

To make effective use of competitive sourcing, and outcomes-based procurement in general, utilities typically need to acquire new expertise and significantly change their approach (or 'culture') to planning, delivering services and solving problems. Traditionally, water authorities have required technical and engineering expertise. Greater use of competitive sourcing will mean that they also require expertise in clearly defining service requirements and outcomes within the overall portfolio of supply resources, and managing 'smart' competitive processes.

In addition, to effectively evaluate the alternatives 'discovered' during the competitive proposal process, they will need to develop a transparent and objective way to assess the delivery risks associated with various solutions, and trade off timeframes, the certainty of demand projections and the flexibility of the project. In traditional project approaches, these trade-offs are addressed during the detailed planning process, and decisions are taken about the risks involved (such as stranding assets, and over capacity). Where the volume and location of a supply source is known and there is little uncertainty around demand, these trade-offs are relatively simple. But where there is greater uncertainty, more complicated analysis is required.

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23 AGL, submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region", June 2005, p 2.

24 The Tribunal understands that further development and implementation of competitive sourcing would essentially require a strategic decision by Sydney Water's board, management and shareholders. In discussing "competitive contracting" in its submission to the Tribunal's Issues Paper, Sydney Water (p.26) suggests that the vehicle for greater use of competitive processes could be through its Statement of Corporate Intent, which is negotiated annually with Sydney Water's shareholding Ministers.

25 In calling for bids for a privately built, owned, and operated (BOO) system for water treatment, Sydney Water's Board "prepared its own reports and design plans, giving it a fallback option should the BOO approach have to be abandoned for some reason." (Chapman R & Cuthbertson S, "Sydney's Water – A Suitable Case for Private Treatment?", *Public Policy for the Private Sector*, Note No.80, April 1999, p 1).

Evaluation tools such as 'real options' analysis can be applied to assist planning and decision-making.[26] These tools are particularly valuable where there is a high degree of uncertainty and a range of alternative scenarios. They can be applied at a detailed planning level (as part of more traditional planning approaches), and also provide an objective way to assess proposals received as part of a competitive sourcing process.

Greater use of competitive sourcing is also likely to require water authorities to make changes to their commercial and contracting processes. For example, to ensure that potential providers and the water authority have a clear, mutual understanding of the required outcome, and the degree of flexibility in how this requirement could be delivered, they will need to allow for considerable dialogue between the parties in the planning stage. Several iterations may be required before the definition of the required outcome is finalised. In addition, water authorities will need to develop evaluation processes that enable a fair comparison of the different alternatives, which may have different price structures and risk profiles. They will also need to ensure that their contracting processes are flexible, to enable contracts to be developed that address the specific risks associated with each project.

Precedents for more flexible and innovative competitive contracting processes exist in government, as well as the private sector. For instance, the Australian Department of Defence has experience using more flexible tender processes – particularly for large-scale projects where it may have a defined requirement, but no detailed solution or statement of work. Under these circumstances, it may first call for expressions of interest, before identifying a preferred tenderer and working with that company to develop and agree upon a statement of work (ie, the detailed solution to meet its required outcome).

In the course of the Tribunal's review, several key stakeholders raised concerns about the need for more sophisticated planning and analysis tools if Sydney Water is to effectively use competitive sourcing. This suggests that a logical first step towards implementing this approach would be for the Government to request that Sydney Water takes the lead in developing a program of work, which may include establishing an industry working group, to develop the methodologies, analysis tools and commercial processes that will be required.

[26] The Real Options approach explicitly addresses uncertainty and the value of future information in the selection and formulation of alternatives. It is suited to situations in which a project (or some of its components) can be delayed, and where there are adjustment costs in reversing a project or its components. See, eg, Zhao, Jinhua, "Uncertainty, Irreversibility and Water Project Assessment," *Water Resources Update*, January 2002, issue 121, pp 51-57.

Addressing the implications for governance and regulatory arrangements

The governance of competitive sourcing arrangements could be assisted by separating the competitive sourcing activity from the water authority's other activities. The degree of separation could range from accounting separation to full legal separation. The Tribunal recommends that the competitive sourcing activity initially form a stand-alone operational group within a water authority, supported by accounting separation.

Competitive sourcing should not affect the water authorities' regulatory obligations. Where a water authority procures services from external providers, it retains primary responsibility for meeting its regulatory obligations. However, its contracts with its service providers should reflect those obligations. The Tribunal understands that this is what currently occurs with Sydney Water's water quality obligations and the existing build-own-operate contracts for water filtration plants.[27]

In the context of this review, the Tribunal notes that competitive sourcing could be implemented separate from or as part of other potential changes. For instance, while competitive sourcing provides a logical step towards more competitive open access arrangements, it could also be an end point for reform.

Recommendation 1

That the Government require water authorities in the Greater Sydney metropolitan area to use competitive sourcing to procure additional water supplies.

Recommendation 2

That the Government require each water authority in the Greater Sydney metropolitan area to separate its competitive sourcing activity from the rest of its operations.

3.2 Consider using outcomes-based procurement in other areas and expanding the current competitive procurement program

While the Tribunal has looked closely at the use of competitive sourcing to procure additional water supplies, it believes there may also be potential benefits in using similar innovative, outcomes-based approaches to competitive procurement in other areas of service delivery. In addition, there may be potential to expand the scope of Sydney Water's current competitive procurement program.

3.2.1 Using more innovative, outcomes-based procurement practices in other service areas

Sydney Water could potentially use other outcomes-based approaches, similar to competitive sourcing, to procure a wide-range of service requirements, and thus extend the scope for increased innovation to other areas of its operations. In doing so, it should first focus on service areas where the potential benefits from dynamic efficiency gains are likely

[27] Were external providers to deal directly with customers such that prices or service standards are affected, or third parties affected by those dealings, then the regulatory regime should expressly apply to those external providers.

to be greatest, such as wastewater management (although innovative approaches to wastewater management may also become apparent via competitive sourcing for additional water supplies).

Other innovative approaches to competitive procurement could also be considered. There are examples in other countries of water utilities not only increasing the extent to which they competitively procure services, but also becoming more innovative in how they structure contracts or calls for tenders. For example, in Toulon, France, the water utility has awarded a 5-year contract to a firm to reduce water losses from the system under which the contractor's only payment is a 50 per cent share of the value of water saved.[28]

The Tribunal believes that the implementation issues for using more innovative and outcomes-based approaches to competitive procurement in other areas of service delivery are likely to be similar to those for using competitive sourcing in procuring water supplies (discussed in section 3.1.4 above).

3.2.2 Expanding Sydney Water's current competitive procurement program

Sydney Water estimates that private sector competitive tenders currently account for approximately 35 per cent of its total operating expenditure and 90 per cent of its capital expenditure.[29] The activities carried out under contractual arrangements include construction, some maintenance, bill issuing and collection, printing, plant hire, fleet management, meter reading, the operation of some smaller sewage treatment plants (STPs) and sewerage systems, and the operation of water filtration plants (under BOO contracts). It also estimates that its current use of competitive procurement has contributed to a 37 per cent decrease in its operating costs since 1994.[30]

There may be potential for Sydney Water to achieve further benefits by extending the scope of its current competitive procurement program, to an extent determined by the relative efficiency of in-house and competitive provision. For example, some areas of field maintenance, customer interface and corporate support services could potentially be contracted out to achieve efficiency savings.

AGL has expressed support for the continuation and expansion of Sydney Water's program of outsourcing to the private sector, in a range of areas including construction and rehabilitation of Sydney Water's distribution, recycled water and sewerage networks; restorations after planned and scheduled maintenance; metering and meter reading; operation of smaller treatment plants and reticulation systems; maintenance of electrical and mechanical systems; scheduled and emergency civil maintenance; call centres and customer billing; operation of maintenance networks; and asset management.[31]

Increasing the scope of competitive procurement could produce a level of competition among bidders that would further minimise Sydney Water's costs and expose it to a wider range of technological options. Private providers may be able to provide services cheaper

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28 Webb M & Ehrhardt D, "Improving Water Services through Competition", *Public Policy for the Private Sector*, Note No.164, December 1998, p 6.

29 Sydney Water Corporation, submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region", July 2005.

30 ibid.

31 AGL, submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region", June 2005.

than a water utility for a range of reasons. For example, independent providers of specific services may reap economies of scale/scope beyond the reach of individual water authorities. Specialist companies may also have lower overhead costs, and tend to adopt new technologies faster than large utilities. For reasons such as these, there is a growing trend amongst water utilities toward expanding the scope for competitive procurement.[32]

Recommendation 3

That the Government require Sydney Water to consider using more innovative, outcomes-based competitive procurement in other areas of service delivery, and expanding the scope of its current competitive procurement program in general.

[32] Webb M & Ehrhardt D, "Improving Water Services through Competition", *Public Policy for the Private Sector*, Note No.164, December 1998.

4 INTRODUCING OPEN ACCESS TO INFRASTRUTURE

The Tribunal believes the second step towards opening Sydney's water and wastewater industry to greater competition should be to introduce open access to infrastructure. New entrants should be permitted to seek access to monopoly water infrastructure to inject water and compete in retail services, initially for large customers. They should also be permitted to seek access to wastewater infrastructure to withdraw wastewater for treatment and sell retail wastewater services, again initially to large customers.[33] In line with the approach taken to reform in other industries and jurisdictions, the Government can consider whether to extend open access competition to all customers once experience has been gained, and a greater understanding of the potential for competition has been reached.[34]

Open access competition has considerable potential to improve the efficiency and effectiveness of service provision in Sydney's water and wastewater industry.[35] Where it is feasible, competition generally provides stronger incentives for efficiency and innovation than regulation. Traditionally, water authorities have required technical and engineering expertise. With the introduction of competition, utilities generally need to acquire new expertise and significantly change their approach to planning service delivery and meeting customer needs (ie, their 'culture'). The introduction of open access competition in the gas and electricity industries in Australia and other countries has generally produced significant efficiency gains, and the water industry has similar characteristics to these industries.

The Tribunal has considered what type of access regime will best support the Government's objective to increase the efficiency, effectiveness and sustainability of water and wastewater service delivery. It found that:

- The access regime should be state-based, to provide the efficiency of a single regulator for pricing and service standards, and maintain a simple and flexible process.
- The access regime should initially be based on a negotiate-arbitrate model, and a future review point should be established to assess the adequacy of the access arrangements and the need for more detailed regulation. This approach allows open access to be introduced in a progressive and evolutionary way, consistent with the Tribunal's recommendation that an adaptive management approach be taken to regulatory change.

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33 In its submission, Sydney Water states that third parties can already seek access to the wastewater network through the allowed arrangements for sewer mining (Sydney Water, Submission to the Independent Pricing and Regulatory Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region", July 2005). The Tribunal's recommendations apply to access arrangements that involve use of Sydney Water's network for the purpose of transporting potable water or effluent from one point to another, which involve the third party having a contractual relationship with an end-use customer that includes the transportation component. Types of access arrangements are set out in Appendix C.

34 While supportive of an open access model, Services Sydney recommends that the Government establish a regime that allows private sector participants to compete for customers at the retail level. (Services Sydney Pty Ltd, Submission to the Independent Pricing and Regulatory Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region", 31 May 2005.)

35 The OECD suggests that the benefits – in the form of innovation, customer responsiveness, productivity and lower prices - of opening vertically integrated monopolies to competition via third party access have, in most cases, be clear (OECD, *Restructuring Public Utilities for Competition*, Paris, Organisation of Economic Cooperation & Development, 2001, p.52).

These conclusions and the Tribunal's considerations on the key features of the initial access regime are discussed in more detail below.

4.1 Access regime should be state-based

There are at present essentially two feasible options for establishing an open access regime for Sydney's water and wastewater infrastructure. The first is to rely on the current Commonwealth access regime under the *Trade Practices Act 1974* (the Trade Practices Act). Under this option, two federal institutions - the National Competition Council (NCC) and the Australian Competition and Consumer Commission (ACCC) - would each play a role, while the Tribunal would continue to be responsible for regulating other aspects of the water and wastewater industry (including prices, service standards, operating licences etc). The second option is to establish an effective state-based regime[36] in which a regulator would regulate access, as well as other aspects of the industry.

After considering both these options, the Tribunal believes that establishing a state-based access regime would be preferable to relying on the current Commonwealth regime. A state-based regime would have a range of significant advantages, including that it:

- Would provide for a single, experienced regulator for all water and wastewater prices, terms and conditions.
- Could be designed to provide for a more simplified, streamlined access and appeal process that is more appropriate to the current industry context.
- Would facilitate effective and efficient coordination of regulatory issues and State Government policy matters (including health and safety, planning, economic, and environmental matters).
- Would improve accountability for the cohesiveness of the overarching economic regulatory regime, which is particularly important given that water is an essential service.
- Would promote consistent regulatory decisions and regulatory efficiency, by avoiding duplication of resources and expertise within the Tribunal and the ACCC. For example, as no urban water infrastructure is currently declared under the Trade Practices Act the ACCC has limited experience in regulating water industries. As the Tribunal has extensive water industry regulatory experience, establishing a state-based regime could leverage the regulatory proficiency currently available, and provide for the future development and concentration of expertise within a single agency.
- Could be designed to promote process and administrative efficiency, for example by reducing the steps associated with declaration and/or stipulating at the outset certain assets that are deemed to meet declaration criteria. The Commonwealth regime applies a particular declaration process; a state-based regime could include a process for identifying infrastructure that is subject to access in a way that is designed to best meet the particular circumstances.

In addition, a state-based regime may not require as extensive legislative support as the Commonwealth regime, and the process for extending, varying or revoking a declaration could be more streamlined. The Commonwealth regime relies on the NCC making a

- [36] The Competition Principles Agreement sets out principles that should be incorporated in a State or Territory access regime.

declaration to a Minister, who must decide to accept or reject the recommendation. A state regime need not use the NCC or include the second tier of Ministerial involvement. Finally, a state regime would not be subject to the constitutional limitations of the Commonwealth. For example, the Commonwealth regime relies heavily on the corporations' power, so that the service provider or third party must be a corporation.

Competition law, rather than specific industry legislation, may not be the most appropriate tool for access. Except for the prohibition on anti-competitive mergers, competition law is concerned with conduct rather than industry structure. Also, the Sydney context calls for a 'bespoke' approach that recognises the particular characteristics and concerns driving water reform in Sydney – that is, a focus on developing new supply sources and efficient water usage, compared with more traditional reform objectives of improved productive efficiency, increased customer choice, lower prices and better service standards.

Also, it is unlikely there will ever be a national market for *urban* water. Under a state-based access regime, arrangements in different jurisdictions can be tailored to reflect location specific issues; a national regime could potentially stifle competition and innovation.

4.2 Access regime should be based on a negotiate-arbitrate model

Experience in other industries suggests that the model for providing access to monopoly infrastructure assets needs to be responsive to the level of demand for access, reflect the level of knowledge about the best possible access arrangements, and the potential market power of access providers. In relation to Sydney's water and wastewater infrastructure, the current level of demand for access is unclear, and there is little knowledge about the optimal content and structure of the access framework.[37] There is also a lack of direct precedents on which to draw to develop detailed access arrangements, because little competitive reform has occurred in the water and wastewater industry in any jurisdiction.[38]

Although it would be possible to develop a detailed regulatory regime for open access at the outset, this would require significant funds and resources. It may be imprudent to expend too much public effort – or lock in too much detail – until there is more certainty about the net benefits of and demand for access. Until the Government is confident of the areas in which competition will emerge, it may be better to internalise the transaction costs involved in enabling access to the parties that will benefit most from this access. This suggests that the most appropriate model is a negotiate-arbitrate model, under which access seekers who believe they can benefit from obtaining access can do so on a commercial basis, with a regulator to arbitrate access disputes and provide guidance on key issues as they emerge.

The Tribunal recognises that the vertically integrated structure of Sydney Water raises the issue of market power and the role of regulation. Where an access provider has significant

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37 Certainly, there is significantly less information and experience available for water and wastewater than was the case when Australian electricity and gas reforms took place.

38 Where practicable, an access model should draw on well-understood national and state regulatory precedents (eg, Trade Practices Act tests, licensing for service providers, contract audit models, water and wastewater industry terminologies, etc). However, regulatory precedents must be considered in light of the problems that the regulation seeks to address. It is not appropriate to simply adopt eg, NSW electricity or gas access precedents, as the competitive drivers for those reforms were quite different. Nor is the England and Wales model a 'direct fit' in that the drivers for a water access code in England and Wales are not targeted at the same water scarcity issues that drive NSW reforms.

market power, specific regulation of access terms, conditions and pricing is likely to be more effective than a negotiate-arbitrate regime. However, given the issues outlined above, the Tribunal believes a negotiate-arbitrate model should be established, at least initially.

At the same time, a future review point should be established, so that the adequacy of the access arrangements and the need for more detailed regulation can be assessed when more knowledge and experience has been gained. For example, because Sydney's water and wastewater infrastructure is a network, granting access to one party may impact on system operation and planning, and may impinge on the ability to give access to other parties in the future. If the demand for access becomes significant, it may be necessary to codify the arrangements for access (for example, by creating an access code).

The Tribunal also believes that Sydney Water's retail water prices should continue to be subject to economic regulation (discussed in Chapter 8) and that consideration should be given to separating Sydney Water's existing retail business from the remainder of the organisation (discussed in Chapter 6). These arrangements will assist in preventing the exploitation of market power.

4.3 Key features of initial access framework

The Tribunal has also considered a range of issues that will determine other key features of the initial access framework. These include questions of:

- What should be the scope of the access regime?
- Who should be entitled to seek access?
- What infrastructure should be subject to access?
- What should be the role of the regulator?
- What information should the access provider be required to publish?

Each of these is discussed below.

4.3.1 What should be the scope of the access regime?

The Government needs to consider whether an open access framework should be developed only with the greater Sydney metropolitan area in mind, or for potential application to the whole of NSW. The Tribunal sees merit in developing a framework that is capable of general state-wide application, provided the regime includes appropriate exception or exemption mechanisms to accommodate possible future developments.

It is likely that there will be areas where government policy supports exceptions or exemptions from the framework when developed – such as to grant an access holiday for a new franchise in order to support an innovative project that otherwise may not proceed. Precedents for exceptions exist in other network industries. For example, since the national gas access code has been implemented, the Productivity Commission has expressed support for access holidays for new pipeline developments.[39] There has also been national debate about greenfield pipeline developments,[40] statutory amendments in Victoria to allow new

39 Productivity Commission, *Review of the Gas Access Regime*, Report No.31, 2004.

40 See draft guidelines and comments on the ACCC's website at www.accc.gov.au.

exclusive distribution and retail area licences,[41] and exclusive franchises granted in Tasmania to help establish a new gas reticulation system.

4.3.2 Who should be entitled to seek access?

Third party access could apply to wholesale water and wastewater service providers. It could also apply to retailers, and, in the NSW context, particularly to those retailers seeking to supply water from new sources. For example, access seekers could be:

- A bulk water and/or wastewater service provider for an area (eg, Western Sydney) seeking injection, transportation and possibly treatment arrangements (where the bulk water supplier has a monopoly franchise).
- Retailers wishing to inject, transport and withdraw water and supply eligible (or contestable) customers.
- Retailers or recycled water service providers seeking to extract wastewater or provide wastewater services to customers.

One option is for open access to be available to any person. This is the case in the current Commonwealth access regime, where the declaration process under the Trade Practices Act establishes a right for any party to apply to the NCC for declaration of a service. If a service is declared and negotiations with the access provider fail, declaration also gives an access seeker the right to seek binding arbitration by the ACCC.

Another option is for open access to be available specifically to market participants. This is the case in the electricity industry, where market participants (generators, customers and network service providers) must be registered, through a formal process strictly defined in the market rules, before they are able to participate in the National Electricity Market (NEM). One feature of this option is the registration of 'intending participants'. These parties must reasonably satisfy the market registrar (in the case of the NEM, the National Electricity Market Management Company) that they intend to perform an activity that would entitle them to be a registered participant. This reflects the fact that new entrants may require certainty regarding access and access to information to help assess the economics of a particular proposal, long before they establish an entity (such as a licensed retailer) that may be eligible to seek access.

Another question related to *who should be entitled to access* is w*hen should rights to access be considered?* Innovation may be stifled if potential service providers cannot first establish eligibility to access infrastructure. In the NSW context, a logical sequencing of decisions may be:

- to first secure an 'in principle' decision on access
- then undertake detailed engineering, feasibility, design studies
- then do detailed planning and environmental analysis, seek approvals, etc.

To facilitate entry into the industry, the Tribunal believes the regulatory mechanism enabling access should be flexible enough to allow any 'designated person' to seek access, where a designated person may be any person, a market participant or a prospective market participant.

41 Section 27 of the *Gas Industry Act 2001 (Vic).*

4.3.3 What infrastructure should be subject to access?

In principle, those water and wastewater assets that exhibit natural monopoly characteristics given their size and location could be subject to open access. Potential assets include treatment plants, transportation infrastructure, dams, reservoirs, natural aquifers and storage facilities.

Assets may be stipulated at the outset (together with a mechanism for later adding or removing assets from the regime). This is the case in the national gas access regime, through the concept of 'coverage' and 'covered pipelines'.[42] Alternatively, rights of access may be determined on a case-by-case basis, by being assessed against known criteria. This is the case with the declaration process under Part IIIA of the Trade Practices Act.

The Government needs to decide who should determine whether assets should be subject to open access, and on what basis. Under the recommended state-based regime, the Tribunal considers it appropriate for access to particular assets to be granted on application, and for the state regulator (ie, the Tribunal) to be responsible for deciding whether or not those assets should be subject to open access. It believes that, unless there is sound reason to diverge, the basis for granting access should draw on the tests in the Trade Practices Act and the Competition Principles Agreement[43] – that is, access should apply to services provided by means of significant infrastructure facilities where:

- it would be uneconomical for anyone to develop another facility
- access (or increased access) to the service would promote competition in at least one market, other than the market for the service
- that access can be provided without undue risk to human health or safety
- that access would not be contrary to the public interest.

Given the above, the Tribunal proposes that access be granted upon application, assessed by the regulator against the above Trade Practices Act criteria. It also suggests that there is scope to identify government-owned assets that meet these criteria, and deem these assets as subject to open access on the introduction of an open access regime.

4.3.4 What should be the role of the regulator?

In administering an access regime, the range of decisions required of a regulator may include:

- determining which assets should be subject to open access
- administering those general regulatory obligations that will apply to new entrants (such as operating licence obligations)
- setting access prices, terms and conditions in arbitrating access disputes

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42 The Gas Access Regime applies to all pipelines that are deemed to be 'covered'. A pipeline can become covered in two ways: either it was deemed to be covered at the time of inception of the National Third Party Access Code for Natural Gas Pipeline Systems, or where it has been subject to a decision that it should be covered. Coverage decisions are made by the relevant Minister following a recommendation from the National Competition Council.

43 The Tribunal notes that access regimes certified as 'effective' by the NCC are also expected to incorporate the principles (a) to (p) set out in clause 6(4) of the Competition Principles Agreement.

- monitoring the efficacy of the regime and advising Government on future regulatory needs, and, if the need arises
- overseeing development of more detailed regulation (eg, an access code).

In addition, the regulator may issue guidelines associated with access regulation. For example, such regulatory guidelines may set out the regulator's interpretation of the relevant infrastructure asset tests that will be used in deciding whether or not assets should be subject to access. They may also set out the pricing principles that should be applied in calculating access prices.

The regulator may also have a role in monitoring and auditing access agreements. Those aspects of an access agreement that relate to access pricing could be subject to the regulator's (statutory) power to override in the public interest, when such terms and conditions contravene regulatory guidelines issued by the regulator. This is the case in the England and Wales guidelines for water access codes, in that the statutory framework enables the regulator to require the access provider and new entrant to vary or terminate contracts which do not conform to the guidelines or cost principles.[44]

4.3.5 What information should the access provider be required to publish?

Chapter 7 sets out the general need for certain information to be readily accessible in order to encourage competition and innovation. In the specific case of open access, indicative prices would assist access seekers in evaluating the viability of different projects. There is a precedent for this in the gas access regime, which establishes approved 'reference tariffs' for services 'likely to be required by access seekers'. Reference tariffs are not binding in their own right, but provide the basis around which negotiation takes place.

Given the importance of information disclosure to the development of competitive regimes, the Tribunal believes access providers should be required to publish information that enables access seekers to assess the economics of particular proposals. While they should be required to consult with access seekers and potential access seekers on the exact nature of this information, it might include indicative access prices, terms and conditions.

44 Sections 66d(7) and 66D(8) of the *Water Industry Act 1991* (UK).

4.4 The Tribunal's recommendations

Recommendation 4:

That the Government establish a state-based access regime for water and wastewater infrastructure, and that the regime is initially based on a 'negotiate and arbitrate' model.

Recommendation 5:

That the Government incorporates the Tribunal's recommended framework in the access regime. This framework comprises:

1. *A regulatory mechanism that enables:*
   - (a) *designated people, who could be:*
     - *any person,*
     - *a market participant, or*
     - *a prospective users*
   - (b) *to seek access to all water and wastewater infrastructure:*
     - *that may be specified at the inception of the access regime, or*
     - *that meets certain criteria (based on the current Trade Practices Act 1974 tests).*
   - (c) *Contracting freedom for the access seeker and asset owner, provided system integrity, operation, health, etc not jeopardised*
     - *Also, possibly, a statutory contract override mechanism if the Tribunal considers contracts to be inconsistent with the Tribunal's regulatory guidelines on access pricing*
   - (d) *The access seeker and asset owner subject to arbitration by the Tribunal if agreement cannot be reached*
   - (e) *regulatory guidelines or other instrument to be prepared by the Tribunal that:*
     - *set out its interpretation of relevant infrastructure asset tests that will be used in deciding whether or not assets should be subject to access*
     - *establish relevant pricing principles that should be applied in calculating access prices*
2. *A request or requirement for Sydney Water (and possibly any other access provider) to publish indicative access prices and services.*
3. *A possible contract monitoring program (under which the Tribunal would monitor and audit the access prices in access agreements entered into).*
4. *A future review point for the Tribunal to assess adequacy of access arrangements/regulation (including the scope for extending access-based competition to smaller customers), and inform Government of findings*

5 PRICING INFRASTRUCTURE ACCESS

How successful introducing open access to infrastructure will be in creating a more competitive market for water and wastewater services will depend largely on how access is priced. If too high an access charge is set, efficient new entrants will not be able to enter the market. If too low a charge is set, the access providers will not receive adequate compensation for new entrants' use of the network, which might reduce their incentive to invest in the network. Moreover, low access charges might encourage inefficient entry, which would raise the total costs of the industry.

As Chapter 4 discussed, the Tribunal believes a state-based, negotiate-arbitrate access regime should be established. However, the Tribunal recommends that negotiations be constrained by specific access pricing principles, to ensure no single access agreement impinges on the feasibility of future access schemes. Given this recommendation, the Tribunal has considered what methodology might be used to determine access prices. In particular, it assessed three possible approaches for determining access prices:

- using the long run marginal cost (LRMC) of access and consumption
- the average cost allocation, or building block methodology
- the Efficient Component Pricing Rule (ECPR).

Based on this analysis, the Tribunal's preferred approach is the ECPR methodology. This methodology sets the highest access charge consistent with facilitating efficient access. (However, is should be noted that continuing retail price regulation will prevent Sydney Water as a whole from earning excessive profits.) It is the approach adopted for calculating access charges in the England and Wales water industry. The Tribunal prefers the ECPR approach largely because it will facilitate the retention of the current postage-stamp pricing arrangements. Another advantage is that it can be implemented in the absence of information about the unbundled costs of Sydney Water's services.

The following sections provide an overview of:

- The Tribunal's approach to assessing the three methodologies
- Its assessment of each methodology
- Its overall conclusions

5.1 Tribunal's approach to assessing the methodologies

In assessing the three pricing methodologies, the Tribunal has assumed there will be a common carriage framework for access (see Appendix C for more detail). Usually, two access charges are levied under such a framework: one charge for injecting water or wastewater into the network, and another for off-taking water or wastewater from the network. In almost all cases, the off-take charge (referred to as a 'use of system' charge in electricity and gas distribution) recovers the average cost of building and maintaining the network (ie the access provider's sunk costs). The injection charge is usually based on the incremental cost of accepting the injection at the specific geographic location. Electricity generators and gas suppliers generally treat the injection charge like any other cost of doing business and bundle it into their wholesale price (along with fuel, operating costs, etc.). The

Tribunal can see no reason why new entrant suppliers in the water industry would not take the same approach.

For this reason, the Tribunal focused its analysis on pricing the off-take charge. Because there is limited international experience in applying the access pricing methodologies in the water industry, it assessed them by developing a number of scenarios under which new entrants might off-take water or wastewater from Sydney Water's network for the purpose of supplying retail services to one or more existing customers. It then calculated the charge for existing off-takes under each scenario using each methodology.[45]

These scenarios, which are set out in detail in Appendix D, use the prices set out in the Tribunal's recent determination for metropolitan water prices.[46] For water supply, the average retail tariff over the price determination period (1 October 2005 to 30 June 2008) is $1.51/kL for residential customers and $1.25/kL for non-residential customers (fixed charge plus usage charge). The average retail tariff for wastewater services over the period is $1.64/kL. In addition, the scenarios assume an LRMC of water supply in greater Sydney of $1.20/kL. As set out in the Tribunal's determination of metropolitan water prices,[47] this is the lower bound of the current estimated range for the LRMC of water supply of $1.20 to $1.50 per kL, based on the Government's Metropolitan Water Plan. All other figures in the scenarios have been assumed by the Tribunal. In addition, all figures are expressed on a per annum basis and the scenarios calculate an average annualised access charge (per kL) for the determination period.

Please note that the purpose of the scenarios is to illustrate the workings of the different access pricing methodologies and in particular the implications for the cash flows of new entrants – they cannot be taken to show indicative access prices.

5.2 Assessment of the LRMC of access and consumption method

The first pricing methodology the Tribunal assessed is the Long Run Marginal Cost of access and consumption method. Under this approach, the access price is based on the (long run) incremental costs associated with providing access. For example, these costs may involve the extra administrative costs associated with arranging access, the LRMC of any necessary incremental network investments (ie any modifications that have to be made to the infrastructure to allow access), and any ongoing operating and maintenance costs that arise as a consequence of access being granted.

The Tribunal's analysis suggests that using this methodology to price access for existing off-takes would result in a very low access price, because the LRMC of providing access for this purpose is minimal. As the customers the new entrants would serve are already taking supply, no new network investments would be required. Therefore the only incremental costs would be Sydney Water's costs of administering the new access regime. Under the scenarios developed by the Tribunal, this cost would be between $0.01 and $0.02 per kL.

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45 Charges for new off-takes are considered in the formulation of the Tribunal's overall conclusion (see section 5.5).

46 IPART, *Sydney Water Corporation, Hunter Water Corporation, Sydney Catchment Authority – Prices of Water Supply, Wastewater and Stormwater Services – Final Report*, September 2005.

47 Ibid, p 18.

The Tribunal considers that this methodology would not be appropriate for pricing access for existing off-takes, because the resulting price would not provide Sydney Water with adequate compensation for new entrants' use of its network (ie it would not recover any of the access provider's sunk costs). However, it notes that the LRMC methodology is likely to be appropriate for pricing access for new injections. In this case, the price would be based on the incremental network investment required to connect the new supply source (including any 'deep' connection charges)[48] and Sydney Water's costs of administering the new access regime. LRMC-based injection charges have significant advantages including:

- ensuring project proponents pay (only) the efficient costs of connection
- providing efficient locational signals for injections (while retaining geographically uniform retail tariffs)
- insulating customers from the costs of connecting new supply sources.

5.3 Assessment of average cost allocation, or building block method

The second pricing methodology the Tribunal assessed is the building block method. This involves calculating the average revenue that the access provider needs to earn in order to recover its capital and operating costs and an appropriate return on assets, and using this revenue requirement as the basis for determining average access charges. One of the advantages of the building block method is that stakeholders are generally familiar with it (as it is used for access pricing in the electricity and gas industries). Another is that it allows all network costs to be recovered (not just incremental costs).

However, the Tribunal's analysis suggests that if this method was used to price access for existing take-offs, the resulting charge is likely to be too high to allow efficient new entrants to compete with Sydney Water's water supply tariffs. The reason for this is that under the building block method, the off-take charge would be set so that it recovers the new entrant's 'share' of the average costs of Sydney Water's whole water supply network.[49] Therefore the new entrant would need to set its own retail prices to recover this 'share' plus its own cost of supply. Given that its cost of supply is likely to be significantly higher than Sydney Water's average cost of water purchases, these prices are likely to be much higher than Sydney Water's retail tariffs. The following (highly simplified) example illustrates this point.

The Tribunal's recent price determination set the price of water supply for Sydney Water's residential customers at \$1.51/kL. Sydney Water's average cost of water supply (bulk water purchases and treatment) is around \$0.50/kL, so around \$1.00/kL goes towards recovering the average costs of the whole network. If an efficient new entrant supplies water from a new water source, the average cost of this water is not likely to \$0.50/kL – it can be expected to be between \$1.20/kL and \$1.50/kL (ie within the current estimate of the LRMC of water supply). So, if the new entrant must also contribute around \$1.00/kL for average network costs through a building-block-based access charge, its total cost of supply would be at least \$2.20/kL (i.e., almost 50 per cent higher than the Sydney Water tariff of \$1.51/kL). In this

48 Deep connection charges recover the incremental costs of connecting the source even where these are remote from the source. For example, changes to reservoirs and pumps required to distribute the injected water would be included in deep connection charges.

49 The new entrant would be allocated a portion of the average network costs that is commensurate with the portion of the network that it uses.

instance, it is clearly not possible for an efficient new entrant to compete with Sydney Water's retail tariffs where access charges are based on average network costs.

The Tribunal's scenario 4 also illustrates this point (see Table 5.1 below, and Appendix D). This scenario looks at a large desalination plant producing potable water for supply to residential customers. The Tribunal calculates that using the building block method, the access charge would be $0.57/kL. This means that the plant would need to supply water at a cost of $0.94/kL to match Sydney Water's retail tariff of $1.51/kL. Given that this cost is significantly less than the LRMC of water supply, it seems that a building-block-based access charge would make it impossible for an efficient new entrant to compete with Sydney Water.

Table 5.1 Scenario 4: New entrant cash flows – access to water system for large desalination plant producing potable water for supply to residential customers

	Building Block	
Water Supply tariff	$1.51/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.57/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$0.94/kL	Retained by new entrant

The Tribunal also considered scenarios where the new entrant wanted to provide wastewater services. As for water services, the new entrant's ability to compete under a building-block-based access charge will depend on the relationship between average and marginal costs. Scenarios 1 and 2 look at new entrants that access Sydney Water's wastewater system in an ocean outfall catchment area and a tertiary treatment plant catchment area. Under these scenarios, the Tribunal calculates that using the building block method, the access charges would be $1.20/kL and $1.35/kL respectively. Given Sydney Water's wastewater charge of $1.64, the building block approach may provide some 'headroom' for a new entrant to be competitive, particularly if it on-sold the recycled water. The headroom under scenario 1 would be $0.44/kL; under scenario 2 it would be $0.29/kL.

Table 5.2 Scenario 1: New entrant cash flows - access to wastewater system in an ocean outfall catchment area

	Building Block	
Wastewater charge	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.20/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.44/kL	Retained by new entrant

Table 5.3 Scenario 2: New entrant cash flows - access to wastewater system in a tertiary treatment plant catchment area

	Building Block	
Wastewater charge	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.35/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.29/kL	Retained by new entrant

Given the current relationship between Sydney Water's average cost of water purchases and the marginal cost of water supply (ie the LRMC of water supply), the Tribunal considers that an access price based on the building block methodology is unlikely to facilitate access to the water supply system for new entrants with new water sources.

5.4 Assessment of the Efficient Component Pricing Rule method

The third pricing methodology the Tribunal assessed is the Efficient Component Pricing Rule (ECPR) method. This involves setting access charges by taking Sydney Water's retail tariff, adding the incremental costs it will incur by providing access and subtracting the costs it will avoid by providing access ('avoided costs').

This method has been adopted for calculating infrastructure access charges in the England and Wales water industry,[50] and is supported by Sydney Water.[51] The Tribunal assessed its appropriateness for pricing access for existing off-takes from the water network, and from the wastewater network.

5.4.1 ECPR-based access charges for the water network

Using the ECPR method to set charges for access to Sydney's water supply system will generally result in a lower charge than using the building block method. This is because the costs that Sydney Water will avoid by not having to purchase the water that the new entrant will supply (ie largely the LRMC of water supply of $1.20/kL) are higher than the average cost of water supply (0.50/kL). These avoided costs are also high in comparison to average retail tariffs ($1.25 for non-residential customers and $1.51/kL for residential customers).

Scenarios 3 and 4 look at large desalination plants that produce potable water to supply non-residential customers and residential customer respectively. These scenarios show that, because the LRMC of water supply is similar to the retail tariff, ECPR-based access charges for the potable water delivery network are likely to be very low (see Tables 5.4 and 5.5, and Appendix D).

50 OFWAT, *Water Act 2003, Water Supply Licensing, Guidance on Access Codes*, June 2005

51 Sydney Water, *Submission to the Independent Pricing and Regulatory Tribunal Review of the Water and Wastewater Industry in the Greater Sydney Region*, July 2005, pp 27 to 31

Table 5.4 Scenario 3: New entrant cash flows – access to water system for large desalination plant producing potable water for supply to non-residential customers

	ECPR	
Water Supply charge	$1.25/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.01/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$1.24/kL	Retained by new entrant

Table 5.5 Scenario 4: New entrant cash flows – access to water system for large desalination plant producing potable water for supply to residential customers

	ECPR	
Water Supply tariff	$1.51/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.25/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$1.26/kL	Retained by new entrant

5.4.2 ECPR-based access charges for the wastewater network

Using the ECPR method to set charges for access to Sydney's waste water supply system is likely to result in high charges. Scenario 1 shows that the ECPR-based access charge for a new entrant accessing the wastewater system in an ocean outfall catchment area would be almost as high as Sydney Water's wastewater charge (see Table 5.6 and Appendix D), largely because the avoided costs are very low. Scenario 2 shows that the ECPR-based access charge would also be high for a new entrant accessing the wastewater system in an inland tertiary treatment catchment area (see Table 5.7 and Appendix D). The main reason is that the avoided capital costs of the treatment plant would only be around $0.07/kL to $0.34/kL. Thus, the access charge under ECPR remains a high proportion of the retail wastewater tariff, even in inland parts of Sydney.

Under ECPR, a new entrant business based on treating and reselling wastewater might expect to obtain its raw material without charge, but it should not expect to obtain significant revenue from disposal of customers' waste – its business case would rely on selling recycled water for more than its processing cost.

Table 5.6 Scenario 1: New entrant cash flows - access to wastewater system in an ocean outfall catchment area

	ECPR	
Wastewater charge	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.62/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.02/kL	Retained by new entrant

Table 5.7 Scenario 2: New entrant cash flows - access to wastewater system in a tertiary treatment plant catchment area

	ECPR ($14m avoided capex)	ECPR ($65m avoided capex)	
Wastewater charge	$1.64/kL	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.38/kL	$1.11/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.26/kL	$0.53/kL	Retained by new entrant

The Tribunal's preliminary analysis suggests that ECPR will facilitate access to Sydney's existing vertically integrated water supply system in a way that is simple and inexpensive to administer. This approach has been adopted in other jurisdictions where simplicity and low costs are key objectives.

5.5 Tribunal's overall conclusion

After considering the advantages and disadvantages of each approach, the Tribunal prefers the ECPR methodology on the basis of retail pricing outcomes and administrative feasibility. It considers that using this approach to price access for off-takes will:

- facilitate efficient entry
- allow the current 'postage-stamp' approach to retail pricing to be maintained
- have a relatively low administrative burden if only a small amount of new entry is anticipated (avoiding the costs of calculating access prices for the entire network).[52]

As discussed above, the LRMC approach is likely to result in Sydney Water not receiving adequate compensation for the use of its network (ie no contribution to sunk costs), while the building block method may exclude efficient new entrants. The ECPR method of calculating

[52] For new off-takes, outcomes under the ECPR methodology will be the same as for exiting off-takes. An LRMC approach would still fail to contribute to the sunk costs of the network, and a building block approach would necessarily be the average cost of existing off-takes.

access charges specifically considers the marginal retailing costs to ensure that efficient new entrants can access the market.

Sydney Water charges retail prices based on the average cost of supply. Prices are uniform throughout the region even though the cost of providing water services varies throughout the greater Sydney area. An ECPR approach to access pricing allows this 'postage-stamp' approach to retail pricing to be preserved, as it allows the retention of existing cross-subsidies, the current allocation of sunk costs, margin and risk, and the cost recovery or equity decisions associated with uniform prices. There are no retail pricing implications for customers retained by the incumbent, if the avoided cost calculation is accurate.

Given the current uniform retail tariffs, a geographically varying access charge would result in new entrants seeing different apparent profitability based on differences in access prices. That is, new entrant suppliers would have incentives to 'cherry pick' low access charge customers.[53] The Tribunal considers that it is inappropriate to develop a geographically varying access charge regime while retail tariffs remain geographically uniform. Therefore, a single (geographic average) access charge would be required under both the LRMC and building block approaches, to mitigate the extent of cherry-picking.

The ECPR methodology subtracts avoidable costs from the current retail tariff. By far the most significant avoidable cost is the LRMC of water purchases. This cost would not be expected to vary geographically in an interconnected system. Therefore, a geographically uniform retail tariff is likely to yield a geographically uniform access charge for the water system under the ECPR methodology.[54]

While some inputs into the ECPR methodology may involve complex calculations, the costs of implementation are unlikely to be prohibitive in the event of a low demand for access. While an LRMC approach is not particularly complex there is no regulatory consensus on a calculation methodology.

The building block approach is a well understood methodology. However, Sydney Water currently charges a 'bundled' retail price for water and wastewater services. That is, retail tariffs for water services include the cost of bulk water, treatment, transportation and retailing, and those for wastewater services include transportation, treatment, disposal and retailing. A building block approach would require the unbundling of Sydney Water's costs of service. ECPR can be implemented in the absence of the unbundling of these costs.

ECPR is sometimes criticised for generating high access prices (including retention of any monopoly rents). For this reason, Services Sydney (the only potential new entrant publicly seeking access to Sydney Water's infrastructure) does not support its use. In its submission to this review, Services Sydney commented that "pricing based on an ECPR approach allows

53 Where competing suppliers are allowed, introducing differential access prices in the presence of uniform retail prices may create incentives for new entrants to 'cherry-pick' those customers that are cheapest to serve. This would have impacts on the incumbent service provider, who may be left with an 'average' retail price to cover the costs of the most expensive customers (with subsequent implications for the Government (as shareholder) and/or customers).

54 There are effectively two wastewater 'systems' serving the greater Sydney area - one serviced by ocean outfalls, the other by inland tertiary treatment plants. Access charges under ECPR are likely to be different between the two.

vertically integrated providers of monopoly infrastructure to continue to earn monopoly profits".[55]

However, the Tribunal does not consider potential retention of monopoly rents to be a significant problem in the context of calculating charges for access to water and wastewater infrastructure in the greater Sydney region, provided that the Tribunal also retains its current role of regulating retail tariffs.

Recommendation 6:

That access to water and wastewater infrastructure be priced according to the Efficient Component Pricing Rule (ECPR).

55 Services Sydney Pty Ltd, Submission to the Independent Pricing and Regulatory Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region", 31 May 2005, p 8.

6 EFFECTIVE INDUSTRY STRUCTURE

In line with the terms of reference for this review, the Tribunal examined the costs and benefits of alternative industry structures. It identified three possible approaches to and goals for changing the current structure of Sydney's water and wastewater industry. These include:

- Disaggregating Sydney Water horizontally (ie breaking it up to form two or more new water and wastewater businesses that would serve different geographical regions) in order to pursue productive efficiency gains.
- Disaggregating Sydney Water horizontally to address issues likely to be associated with a Growth Centres Commission water authority (such as insufficient economic scale and a higher cost structure).
- Disaggregating Sydney Water vertically (ie separating some of its functions, particularly those with that are potentially competitive, from those that are natural monopolies) to facilitate the development of open access competition.

Based on its analysis of the information and evidence currently available to it, the Tribunal believes that disaggregating Sydney Water horizontally has the potential to provide opportunities for productive efficiency gains. However, as it cannot be reasonably confident that that the benefits would outweigh the costs, it considers there is insufficient justification to pursue this approach at this stage. In addition, given that Sydney's most pressing problem at present is water scarcity, it seems more appropriate to focus efforts and available resources on improving the dynamic efficiency of the industry, which can help to address this problem.

In relation to disaggregating Sydney Water to address the issues likely to be associated with a Growth Areas Commission water authority, the Tribunal believes this approach could be feasible, but several complex matters would need to be addressed. In particular, the newly formed businesses may have significantly different cost structures, which would have implications for pricing and cost recovery. They would also probably need to 'share' major infrastructure assets. The Tribunal has assessed several options for addressing these matters, and found that each has disadvantages.

In regards to unbundling Sydney Water vertically to facilitate the development of open access competition, the Tribunal found that this approach has been used successfully in other industries where open access has been introduced in conjunction with 'building block' access prices. However, at this stage, it is unclear that the benefits of such structural reform would justify the costs, particularly as the level of demand for access is largely unknown. As set out in Chapter 5, the Tribunal's recommended approach to access pricing (the Efficient Component Pricing Rule) can be implemented in the absence of information about the unbundled costs of Sydney Water's services.

The Tribunal's analysis and conclusions on each of these approaches are discussed in more detail below. Based on this analysis, and in line with its adaptive management approach to industry reform (discussed in Chapter 1), the Tribunal recommends that disaggregation of Sydney Water should not occur at this time.

6.1 Disaggregating Sydney Water horizontally to pursue productive efficiency gains

Philosophically, decisions to disaggregate large, monopoly utilities such as Sydney Water can be approached in one of two ways. The first involves an in-principle decision that disaggregation is desirable and should take place unless there is evidence that it will result in significant losses of efficiency or costs (negative assurance). The second requires that there be reasonable confidence that disaggregation will result in efficiency gains, cost savings or other benefits before a decision to disaggregate is made (positive assurance).

In considering disaggregation as part of this review, the Tribunal has adopted the second approach, and formed its recommendations based on its assessment of the extent of the benefits likely to be realised through the horizontal disaggregation of Sydney Water. It believes that this positive assurance approach is more appropriate for this review, given that its objective is to identify the industry arrangements that will optimise the efficiency, effectiveness and sustainability of service delivery, and that the primary problem confronting the industry is water scarcity (not productive inefficiency).[56]

The Tribunal identified three potential sources of benefits from the disaggregation of Sydney Water, including:

- *Economies and diseconomies of scale.* Disaggregation could lead to efficiency gains if Sydney Water is currently larger than the optimal size for a water utility and thus characterised by diseconomies of scale.
- *Comparative performance and yardstick competition.* Disaggregation could lead to efficiency gains if it resulted in effective yardstick competition between the newly formed businesses.
- *Changes in management approaches and culture.* Disaggregation could lead to efficiency gains if it resulted in positive changes to management approaches and decision-making in the newly formed businesses.

It then examined the available information and evidence to assess whether there is reasonable confidence that these benefits will be realised. Its considerations and conclusions are discussed below.

6.1.1 Economies and diseconomies of scale

There is evidence to suggest that water and wastewater services are characterised by significant economies of scale, which occur when the unit cost of production decreases as the volume of output increases. However, there is also evidence to suggest that when water utilities reach a certain size (for example, in terms of number of connections served), they begin to experience diseconomies of scale – that is, the unit costs of production begin to increase as output increases.

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[56] This view was generally supported by stakeholders. See, for example, Public Interest Advocacy Centre (PIAC), *Submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region"*, June 2005, p 5; Sydney Water Corporation, *Submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region"*, July 2005, p 32; and AGL, *Submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region"*, June 2005, p 1.

Several studies have been conducted in other jurisdictions to look at economies and diseconomies of scale in the water industry (see Appendix F). These studies suggest that, in serving approximately 1.6 million connections, Sydney Water is at or approaching a size at which water utilities in other jurisdictions have been found to experience diseconomies of scale. In addition, this number of connections is significantly larger than the minimum number that some sources assert is required to achieve economies of scale.[57] However, it is difficult to generalise the results of these studies, as they are influenced by the specific circumstances of the water utilities involved, such as the technology they use, the condition of their assets, the population density of the areas they serve, and the natural terrain of these areas. For this reason, the Tribunal considers that they do not provide direct 'evidence' of the optimal size for water utilities in Sydney.

There was no specific information available to the Tribunal to determine the optimal size of a water and wastewater utility in Sydney, or where Sydney Water currently sits on the economies/diseconomies of scale spectrum. In its submission to the review, Sydney Water stated only that "the Australian industry experience implies that there are significant economies of scale, with urban utilities typically serving around 1 million people."[58]

Given all the above, the Tribunal considers there is insufficient information or evidence to determine whether Sydney Water is currently characterised by diseconomies of scale, let alone to determine the extent of any such diseconomies. It therefore believes that the potential benefits of addressing diseconomies of scale do not provide sufficient justification for pursuing horizontal disaggregation at this time.

6.1.2 Comparative or yardstick competition

Disaggregating Sydney Water horizontally could potentially allow 'comparative competition' between two or more water utilities in the Greater Sydney metropolitan area. Having two or more comparable providers of water and wastewater services can lead to productive efficiency gains by exerting pressure on the managers of these utilities to continually improve the performance of their businesses in key areas (such as cost, leakage levels, burst mains, water quality, customer service, and water conservation), particularly if information on comparative performance is published and readily available to stakeholders and the wider community. It can also lead to productive efficiency gains by improving the effectiveness of regulation, as having two or more 'comparable' utilities can help to reduce the incidence of asymmetric information between regulator and regulated utility.

In Melbourne, the three retail water companies are subject to 'competition by comparison'. The regulator, the Essential Services Commission (ESC), reports annually on each company's performance against indicators that relate to quality of supply, reliability of supply, affordability, customer service and environmental performance. According to the ESC, comparative competition "provides incentives for businesses to improve their performance relative to that of other businesses and also to improve their own performance over time."[59]

However, to be effective, comparative competition requires a relatively high degree of 'comparability' between utilities. This is the case in Melbourne, where the three water

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57 See Strategic Management Consultants (2002) and World Bank (1997) in Appendix F.

58 Sydney Water Corporation, *Submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region"*, July 2005, p 18.

59 Essential Services Commission (2004, p.4), Performance of Melbourne's Metropolitan Water and Wastewater Businesses July 2003 – June 2004, www.es.vic.gov.au.

retailers are similar in terms of their system characteristics and costs. By comparison, the information available to the Tribunal suggests that were Sydney Water to be disaggregated, the disaggregated entities would probably be quite different in terms of costs and operational characteristics (see section 6.2, below). For this reason, the Tribunal believes that the potential benefits of comparative competition do not provide sufficient justification for horizontal disaggregation.

6.1.3 Changes in management approach and culture

The process of significantly restructuring an industry or business can provide an opportunity for innovation and change and hence lead to major gains in productivity. For example, disaggregation may provide the catalyst to bring in new skills and experience, change processes, systems and management regimes, and invigorate workplace 'cultures'.

Anecdotal evidence suggests that the process of restructuring the Melbourne water industry in the 1990s revealed many opportunities for improving productive efficiency and introduced a more productive workplace culture.[60] While difficult to validate, this belief is supported by continued cost reductions in the years following the disaggregation of Melbourne Water.

However, the Tribunal was not able to quantify the extent of potential benefits from a change in water utility practices or culture as a result of disaggregation. Therefore, it believes that these potential benefits do not provide sufficient justification for the disaggregation of Sydney Water a this time. It also notes that horizontal disaggregation is not the only way to achieve changes in workplace culture. For example, its recommendations for making better use of competitive procurement (discussed in Chapter 3) and introducing open access to water and wastewater infrastructure (discussed in Chapter 4) are likely to engender such changes, and so may also lead to productive efficiency gains.

6.2 Disaggregating Sydney Water horizontally to address likely issues with a Growth Centres Commission water authority

As section 2.3 discussed, the Government is undertaking a program of initiatives to address forecast growth in the Greater Sydney metropolitan area, and the newly established Growth Centres Commission is set to become a water supply authority. In considering the geographic boundaries of Sydney Water and a Growth Centres Commission water authority, two specific issues are likely to arise:

- *The financial viability of Growth Centres Commission water authority on standalone basis.* Given the initial small size of the growth centres, and the moderate pace of their expected growth,[61] a water utility established on a standalone basis to service these areas is unlikely to achieve a minimum efficient scale. In addition, a standalone business is likely to require significant financial or cash flow support, given that in the early years it will have high expenditure requirements but a limited customer base.
- *The higher cost structure of Growth Centres Commission water authority on standalone basis.* The detailed commercial and other arrangements for supply of water and wastewater

60 Meetings between IPART Secretariat and participants in the Melbourne Water restructure/reform, Melbourne, 4 July, 2005.

61 The growth centres are not expected to reach their ultimate size of 160,000 new dwellings until approximately 2030.

services to the Growth Centres Commission water authority service area have not been determined. However, it is expected that the average cost of providing water and wastewater services will be significantly higher than the average cost of services to the Sydney Water service area. This has implications for cost-recovery and pricing in the Growth Areas. As Chapter 1 discussed, Sydney Water's current prices are based on the average cost of supply throughout the Greater Sydney metropolitan area, so all customers pay the same amount for equivalent services. To achieve cost-reflective prices and recover the costs of service provision, prices in the Growth Areas would need to be significantly higher than in the rest of Sydney.

There are several ways in which the Government and the Growth Centres Commission might decide to address these issues. For example, both issues could be managed in the short to medium term by financial support from the Government to the new water authority, funded directly or indirectly through some kind of a levy or cross subsidy. Some of the difficulties associated with insufficient scale could also be addressed by the new water authority contracting out service provision (or parts of service provision).[62] In addition, both issues could potentially be addressed by transferring assets, functions and customers from an existing Sydney Water service area to the new water authority. As the latter option would involve effectively disaggregating Sydney Water, the Tribunal has considered how it might work.

After discussions with Sydney Water, the Tribunal considers there are two ways to disaggregate Sydney Water horizontally:

- *A River-Ocean split.* The first option is to 'split' the utility along wastewater catchment lines, which Sydney Water indicated is a logical boundary. Under this scenario, a 'Sydney-River' business would service those customers whose wastewater was inland draining (ie those areas with tertiary treatment and river discharge). A 'Sydney-Ocean' business would service those customers whose wastewater was coastal draining (ie those areas with primary treatment and discharge into the ocean). As water reservoir zones do not exactly match wastewater catchments, interface arrangements with respect to the water system would be required.
- *A North-South split.* The second option is to split the utility into a northern business and a southern business (essentially north and south of the Harbour/Parramatta River). Under this scenario, a 'Sydney-North' and 'Sydney-South' business would each be responsible for part of the 'ocean-discharge' area as well as part of the higher cost 'river-discharge' area. Each business' area of operations would contain a Growth Centre.

The Tribunal undertook a preliminary assessment of each option. It found that under both options, both businesses would reach sufficient scale. In terms of technical viability and operational issues, discussions with Sydney Water suggest that under a River-Ocean split, a minimum sharing of assets would be required. A North-South split would be more complicated technically, as major infrastructure would be shared between the North and South businesses. In particular, a single, significant water main is likely to supply regions in both entities.

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62 One of the advantages of establishing a Growth Centres Commission is the ability for the Commission to direct and co-ordinate infrastructure investment across the new growth areas. For example, the Growth Centres Commission could contract out the supply of water and wastewater services to Sydney Water, but contract out the provision of recycled water to a new entrant.

In terms of the resulting cost structures, the businesses formed under the River-Ocean option are likely to be quite different. Data from Sydney Water indicates that the costs of a Sydney-River business would be around 1.6 times those of a Sydney-Ocean business (for water and wastewater services combined).[63] This is essentially due to differences in the wastewater treatment technologies each business would use (and their different costs) but also reflects differences in population density. The costs of the businesses formed under the North-South option would also be different, but to a lesser extent.

These cost differences mean that disaggregation (particularly under the River-Ocean option) would involve making the cross subsidies within the current postage stamp pricing arrangements in Sydney explicit. (Under these arrangements all customers within a customer class pay the same price for a service regardless of where in the Greater Sydney area they are located, even though the underlying costs of service delivery vary across geographic areas.) In addition, the Tribunal considers it unlikely that the Government would support pricing on the basis of the *full* cost differentials.

The Tribunal considered how issues associated with shared assets and differences in cost structure could be addressed. It found that:

- The issues of shared assets could be addressed through commercial agreement between the newly formed entities. This option is used (albeit supported by regulation) in electricity distribution to deal with 'cross border flows etc'. Alternatively, the shared assets could be transferred to a new company or to the Catchment Authority. The latter option is explored in section 6.2.1 below.
- Differences in cost structures could be addressed through non-structural means. These means are discussed in section 6.2.2 below.

In any case, if the horizontal disaggregation of Sydney Water is to be further considered, the Government will need to decide whether it wants to achieve completely uniform water prices across the disaggregated businesses, or whether it is prepared to have some divergences in prices, provide these are 'reasonable'. This issue is discussed in section 6.2.3.

6.2.1 Transferring shared assets to the Catchment Authority

The current boundary for the Catchment Authority is the inlet to the water filtration plants – that is, at the 'upstream' extreme of the water supply chain (from a potable supplier perspective). The Tribunal understands that the problem of 'shared assets' could largely be addressed by transferring treatment plant, large water mains and, potentially, pumping station assets to the Catchment Authority. This would effectively change the Catchment Authority's role from being the supplier of '*raw*' water to Sydney to being the supplier of *potable* water.

Transferring these assets to the Catchment Authority could also help to address the issue of differences in cost structures, by enabling some averaging of water treatment costs within this entity. However, the Tribunal's analysis (based on Sydney Water data) suggests that under a River-Ocean split, the differences in the two businesses' costs of providing water

[63] Note that this figure is an estimate of direct service costs – it does not include corporate overhead and customer service costs. However, it is not expected that the inclusion of those costs would significantly change the differential.

services would still be significant, even after the costs of water treatment are averaged across the metropolitan region.

This option would necessitate changes in governance and regulation – for example, shifting some current water quality regulations from Sydney Water to the Catchment Authority, and changing the contractual parties to current build-own-operate projects for water treatment plants. It would also require steps to ensure that the Catchment Authority has sufficient expertise to take on its new role (such as the transfer of staff from Sydney Water).

Overall, the Tribunal considers that transferring assets to the Catchment Authority to address the issue of shared assets is likely to involve high transaction costs, including changing the Catchment Authority's role and functions, so that it is more like Melbourne Water, and would need to be supported by close examination of governance arrangements. The transfer of water treatment assets to allow averaging of these costs across 'River' and 'Ocean' areas would only go some way to addressing the significant cost differentials that exist between the two areas (cost differentials between the North and South areas are less significant).

6.2.2 Addressing differences in cost structures through non-structural means

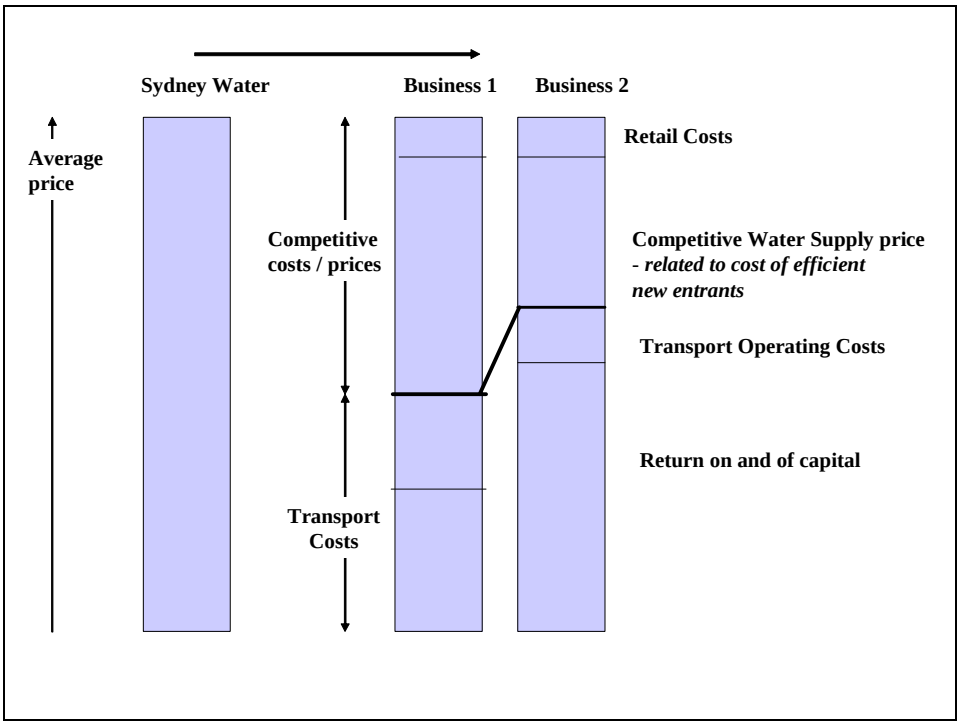
The differences in cost structure in a disaggregated Sydney Water identified above, and the pricing 'problems' these difference would create could be addressed through non-structural means that would essentially transfer costs between the entities. The key options include:

- Setting/adjusting the Initial Capital Base (ICB) for the two businesses to 'capitalise' cross subsidies. This involves adjusting the value of the ICB for regulatory purposes downwards (and subsequently lowering the return on and of capital) until the overall cost of service is the same for both businesses. The principle for setting the ICB for government-owned monopoly assets is that it can be anywhere between the Optimised Depreciated Replacement Cost (ODRC) (or the Optimised Deprival Value (ODV)) and scrap value. If the lower end of the range is chosen, the business needs to be financially viable. This option is illustrated in Figure 6.1 below, where the return on and of capital for Business 1 is lower than for Business 2 to account for Business 1's higher costs and equalise the prices of both businesses.[64]
- Establishing direct subsidies or levies between businesses. A further option would be to establish some form of equalisation payment, subsidy or levy arrangement. This could be used to ensure acceptable differentials between retail prices in the disaggregated areas. To provide appropriate incentives, these payments would need to be seen as transfers between customer groups, and they should be set on an ex ante

64 This option has been applied in Victoria:
Victoria Electricity. The Victorian electricity industry was restructured in 1994. In order to achieve acceptable differentials between retail electricity prices charged by the two rural distribution businesses (DBs) and the three urban DBs; urban Initial Capital Bases (ICBs) were written up and rural asset ICBs were written down. This was combined with other subsidy mechanisms (see below). After around six years, divergences between rural and urban retail prices started to emerge. This was due to gradual depreciation of the adjusted ICB and the addition of unadjusted new capital expenditures to the ICB.
Victoria water business. As part of the recent introduction of economic regulation, the government has set ICBs for all water business (rural and urban) based on the Discounted Cash Flows of each of the business so as to achieve a price path consistent with current prices. This has been to avoid price shocks. The Essential Services Commission provided advice to the Minister based on a Terms of Reference setting out the government's policy objectives.

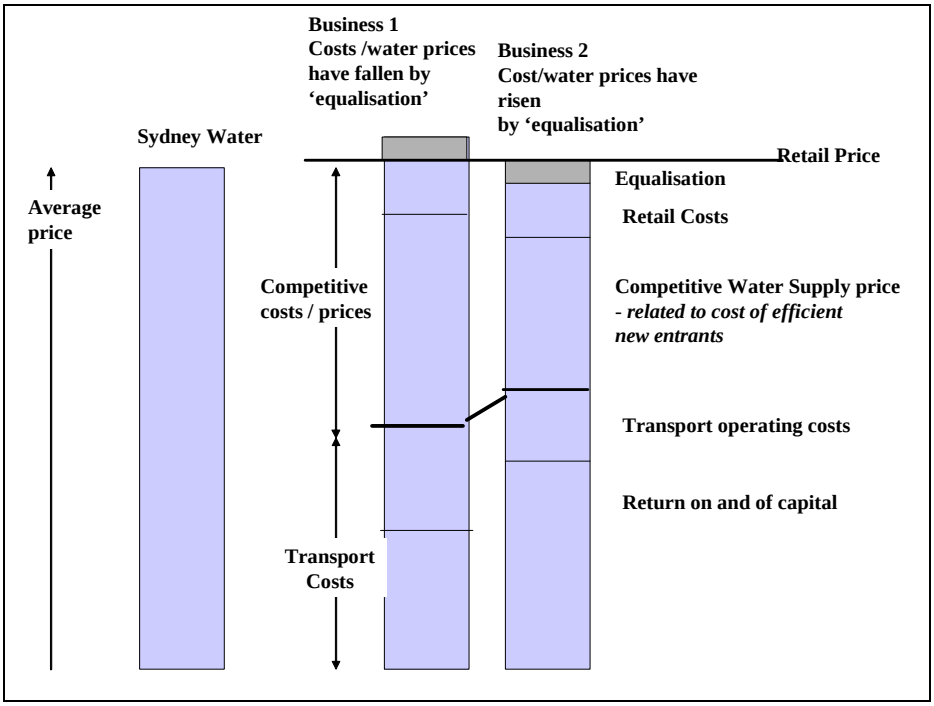
basis. Equity and efficiency considerations may result in the subsidies being targeted at specific groups of customers, such domestic customers only. One simple mechanism for organising equalisation might be through equalisation transfers included in the Catchment Authority's prices. An alternative would be to make payments direct from the State budget. This option is illustrated in Figure 6.2, where customers of Business 2 effectively subsidise the customers of Business 1 by paying a higher price (via an 'equalisation' amount) than is purely cost-reflective.[65]

Figure 6.1 – Adjustment of Initial Capital Base



[65] Relevant experience on the use of direct subsidies and levies can be drawn from the Victorian electricity industry reform. In addition to adjustments to ICBs (noted above), equalisation amounts were incorporated into transmission charges such that rural distribution businesses (DBs) paid lower transmission charges than they otherwise would and urban DBs paid higher transmission charges. This was a one-off up front adjustment undertaken as part of the industry's restructuring.
As price differences emerged between rural and urban DBs due to the gradual depreciation of the upfront ICB adjustment noted above, the Victorian Government subsequently decided to introduce a rural pricing subsidy ("Special Power Payment"), administered by the rural DBs and targeted at household consumers. The Government makes on going decisions on the level and nature of these payments as part of the annual budget process.

Figure 6.2 – Levy or equalisation payment



To fully explore the viability of the first option, detailed financial modelling would be required to understand:

- the extent to which the ICBs of the businesses would need to be adjusted to deliver uniform prices, or price differentials within an assumed 'acceptable' limit (eg 10 per cent)
- whether changes can be effected while maintaining financial viability (writing down asset values reduces prices through the effect on return on and of capital, but the cash flow requirements of the business are not changed)
- whether adjusting the ICBs would have any 'enduring effect' or would unwind quickly (as assets are replaced at their 'true' replacement value, the capital base will gradually move away from the adjusted value, causing price differentials to re-emerge over time).

Even without undertaking such modelling, it is possible to draw the following preliminary conclusions:

- in concept, adjusting the ICBs is a straightforward process, although it would require significant modelling effort
- this approach has the potential to significantly reduce price differentials, but other steps may be required, particularly to ensure that the overall financial strength of the businesses are maintained and are comparable
- this approach may result in narrow price differentials in early years but, depending on differences in future costs, these differentials may gradually increase over time. The Tribunal believes that this is likely to be the case with a disaggregated Sydney Water, given that the cost differentials between the potential new businesses are significant (particularly if a River-Ocean split is used). It notes that the cost differentials in the disaggregated Melbourne Water businesses have increased over time, and that the

underlying cost differentials implied by a River-Ocean split of Sydney Water would significantly exceed those observed in the case of Melbourne Water.

In relation to the second option, introducing a levy or equalisation payment, the Tribunal notes that any form of cross subsidy (especially one that must be regularly reviewed rather than set on a one off basis) has the potential to cause ongoing dispute.

6.2.3 Considering regional differential water pricing

Based on its preliminary analysis of the cost structures of the businesses likely to be created by disaggregating Sydney Water horizontally, the Tribunal believes it is questionable whether uniform pricing can be achieved across the Greater Sydney metropolitan area (particularly if a River-Ocean split was used). If uniform pricing were to be attempted, it would almost certainly involve complicated administrative arrangements and the creation of incentive and gaming problems (eg it might create an incentives for businesses to inflate their operating cost requirements to gain higher subsidies). The more volatile and unpredictable are costs and margins, the more difficult it will be to ensure uniform pricing.

If an equalisation or subsidy arrangement is required, from an efficiency and administrative simplicity perspective, it will be preferable to set any equalisation arrangement in advance. Ideally, this would be done on a multi-year basis, as part of the regulatory approval of network costs, to allow fluctuations in retail costs and water supply prices to be reflected in pricing to end users.

A clear idea on key model assumptions/parameters and policy objectives would be required *before* any modelling work to support disaggregation could commence. For example, decisions of the following issues would need to have been made:

- the nature of the geographical split to be modelled (ie, on what basis should assets be allocated? River-Ocean, North-South or some other combination?)
- the extent to which price differentials are acceptable (eg, should modelling work assume zero price differential, a maximum of 10 per cent differential, or a 20 percent differential ?)
- whether there would be any explicit cross-subsidies/levies to assist in addressing cost differentials, and if so, how large and over what period?

Each of these factors would require policy direction from Government.

The Tribunal notes that in the Melbourne water industry, retailer water prices are not uniform due to differences in the retailers' own costs and differences in the bulk water and wastewater charges set by Melbourne Water. Melbourne Water sets bulk water and wastewater charges on a cost-reflective basis using a detailed model. Thus, each retailer pays water charges that reflect its costs of water supply and treatment. Similarly, the wastewater charges reflect the retailer-specific components of wastewater treatment costs. Information from the ESC in Victoria suggests that cost differentials between the three Melbourne retail businesses are in the region of 10 to 15 per cent.[66]

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66 The ESC's draft determination on water prices for Melbourne contains price and cost information for the three Melbourne water retailers and Melbourne Water. It is available at: http://www.esc.vic.gov.au/water955.html.

In addition, in Sydney's electricity market, there is a small difference in the distribution prices charged in Integral Energy's territory (Western Sydney) and in Energy Australia's (Eastern Sydney), due to differences in the cost of supply. These examples indicate that non-uniform pricing within a metropolitan area is accepted, if not usual.

6.3 Disaggregating Sydney Water vertically to facilitate the development of open access competition

As Chapter 4 discussed, the Tribunal recommends the establishment of an open access regime. This would allow new entrants to share access to Sydney Water's infrastructure and facilities that exhibit natural monopoly characteristics (eg, water and wastewater transportation), while competing in the areas that are potentially competitive (such as water storage and harvesting, wastewater treatment and disposal, and retail services). (See Appendix B for a more detailed explanation of this approach).

Third party access can be introduced to a vertically-integrated monopoly such as Sydney Water. Alternatively, access regulation can also be accompanied by the vertical separation (or 'unbundling') of an incumbent monopoly's non-competitive activities from its competitive activities. Progressive unbundling of the activities of an incumbent, vertically integrated service provider has been a feature of industry reforms involving third party access and 'building block' access pricing. The extent of vertical separation (or 'unbundling') has ranged from accounting separation to full legal separation or divestment.

In many industries, full legal separation (vertical unbundling) has been seen as the way to maximise the level of competition under an access regime. According to the OECD, "The primary advantage of vertical separation is that it reduces the incentive of the provider of the non-competitive activity to restrict competition in the competitive activity. This is an important advantage because it lessens the regulatory burden, enhancing the quality of the regulation and the level of competition."[67]

While the Tribunal acknowledges that vertical unbundling of Sydney Water could enhance access service and help to maximise competition under an access regime, it does not believe that this option is warranted at this stage. As discussed in Chapter 5, the Tribunal's proposed ECPR approach to access pricing can be implemented in the absence of information about the unbundled costs of Sydney Water's services. Furthermore, it is currently unclear that the cost of such structural reform would be less than the benefits – particularly as the level of demand for access is largely unknown.

The position on the vertical separation of Sydney Water could be reviewed in time, when more information is available on the demand for access and the number of new industry participants (ie, when an assessment can be made of the extent to which competition has emerged under the Tribunal's proposed access arrangements). This is in line with the Tribunal's adaptive management (or 'evolutionary') approach to water and wastewater industry reform (as discussed in Chapter 1).

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67 OECD, *Restructuring Public Utilities for Competition*, Paris, Organisation of Economic Cooperation & Development, 2001, pp 20-27.

Ibid, p.21.

Recommendation 7:

That the Government not undertake structural disaggregation of Sydney Water, at this time.

7 REMOVING BARRIERS TO COMPETITION, PRIVATE SECTOR PARTICIPATION AND INNOVATION

As the previous chapters discuss, the Tribunal recommends that steps be taken to open up Sydney's water and wastewater industry to competition, with the aim of creating a more dynamic market in which private sector participants compete to identify opportunities to provide innovative water and wastewater services that meet customers' needs within an environment of increased water scarcity. For such a market to develop and flourish, certain aspects of the existing legal and regulatory arrangements for the industry need to be changed, to facilitate competition, remove barriers to private sector involvement, and encourage the development of innovative services that use alternative water sources.

In particular, the Tribunal believes the following changes need to be made:

- Removing impediments to private sector participation created by a range of statutory provisions.
- Improving arrangements for the collection and dissemination of information about the water and wastewater market, to better support private sector participation and innovation.
- Establishing property rights for all water resources, to provide the necessary security for using alternative water sources.
- Ensuring that clear and robust guidelines and rules are in place for recycled water, to facilitate the matching of water quality to end use.
- Ensuring that environmental impacts are adequately accounted for and factored into decision-making.

Each of these changes is discussed in more detail below. The Tribunal's recommendations in relation to the overall approach that should be taken to regulatory change are discussed in Chapter 9.

7.1 Removing statutory impediments to private sector participation

Although there are no express legislative prohibitions on private sector involvement in the water and wastewater industry, several statutory provisions impede such involvement. For example:

- Statutory deemed contracts (and associated payment obligations) between Sydney Water and land owners under section 55 of the *Sydney Water Act 1994* will continue to apply notwithstanding the land owner entering a new agreement for the same services with a private sector entity.
- For potable water sourced from Sydney Catchment Authority, section 16(1) of the *Sydney Water Catchment Management Act 1998* precludes supply to anyone other than a body that is authorised under an Act to supply water for consumption. There is no such legislation in place authorising a private sector body to supply water for consumption.
- Any person who is supplied water by a private sector entity must have a 'water use approval' in place, under section 342(1) (a) of the *Water Management Act 2000*.

- To develop private infrastructure to supply recycled water or wastewater services, a private sector entity would need various planning, construction and property access approvals, licences and consents. Unlike existing water authorities, the private sector body would have no statutory rights to access or acquire property to construct and maintain works.[68]
- To utilise Sydney Water's wastewater infrastructure requires an agreement with Sydney Water, as it is an offence under section 49(1) of the *Sydney Water Act* to discharge any substance into a work owned by Sydney Water without a written agreement.

The current legal and regulatory arrangements needs to be reviewed to identify all statutory impediments to private sector involvement and competition in Sydney's water and wastewater markets, and, where warranted, statutory changes made to remove these barriers.

Recommendation 8:

That the Government review current legal and regulatory arrangements to identify all statutory impediments to private sector involvement and competition in Sydney's water and wastewater markets, and, where warranted, remove these impediments.

7.2 Improving arrangements for collection and dissemination of system and resource information

In the more dynamic water and wastewater market envisaged by the Tribunal, various participants would compete to identify opportunities to provide innovative water and wastewater services that meet customers' needs, comply with relevant environmental, health and planning requirements, and reflects the growing scarcity of water. For this kind of market to succeed, participants need to be able to efficiently access a range of information about the water and wastewater market. If the processes for accessing information are costly, or relevant information is simply unavailable, this is likely to present a substantial barrier to market participation and innovation.

Identifying and implementing investment opportunities in competitive utility markets typically requires access to a large amount of information. In Australia's National Electricity Market, the National Electricity Market Management Company (NEMMCO) has a central responsibility for providing information to assist market participants (see Box 7.1). Similar arrangements exist in competitive utility markets in other countries.

As a first step towards making appropriate information on Sydney's water and wastewater markets available, Sydney Water should be required to regularly prepare and publish a

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68 AGL's submission to the Tribunal points out that amendment of the licensing regime will be required to provide for private participation and activity-based licences. According to AGL, activities would include raw water treatment, water distribution (potable and recycled), waste water collection and treatment and, eventually, water retailing (potable and recycled). AGL also state that, where necessary, legislative changes should be made to: facilitate private sector participation in infrastructure provision, etc, such as rights to access land and lay pipe; establish clear standards for recycled water; and remove any impediments to Sydney Water entering into appropriate commercial arrangements with the private sector (eg, via Public Private Partnerships, Build-Own-Operate-Transfer and Build-Own-Operate schemes and other structures).

System Information Statement. In addition, given Sydney Water's market power, the Tribunal should oversee the development and consultation process in relation to the provision of information, and should be provided with appropriate enforcement powers. The following sections discuss:

- what information should be made available
- how this information should be managed and disseminated
- the Tribunal's suggested approach for implementation.

Box 7.1 Provision of information in the National Electricity Market

The National Electricity Market Management Company (NEMMCO) was established in 1996 to administer and manage the National Electricity Market, and is owned by the participating State governments. Each year, it publishes a *Statement of Opportunities* (SOO), which is a 10-year forecast intended to help market participants assess the future need for generation capacity, demand-side response and augmentation of the network. It contains a wide range of information, including:

- demand forecasts
- details about the capacity of existing and committed generating plant
- transmission capability advice on the impact of technical limits on the network
- various other details to assist potential investors to gain a full understanding of the National Electricity Market.

NEMMCO undertakes regular consultation with stakeholders to ensure the information provided in the SOO is relevant to stakeholders needs. It also publishes other information, including the *Projected Assessment of System Adequacy*, which provides forecasts ranging from 7 days ahead to 2 years ahead.

7.2.1 What information should be available?

Information about the water and wastewater market can be divided into three categories:[69]

- **System information,** which includes information related to existing operating systems (System Operation Information), and short to medium-term planning for these systems. It also includes information related to planning for the long-term integrity and adequacy of systems (System Planning Information). (See Table 7.2 for more detail).
- **Resource information,** which includes information on the availability, quality, reliability, security, and constraints on use of various water resources (eg, wastewater, stormwater, groundwater, irrigation water, grey water), which could have a particular focus on water resources not currently utilised.
- **Commercial information,** which includes information owned by a particular party, some of which may be commercially sensitive.

In general, all system and resource information should be available for public release.

[69] The Tribunal's open access framework envisages information disclosure by access providers. While consultation would be required on the exact nature of such information disclosure, it may include a requirement to publish indicative access prices, terms and conditions (see section 4.3.5).

Table 7.2 System information

System operation	Operating systems associated with: - Potable supply - Recycled supply - Wastewater	Short and medium-term planning, scheduling and dispatch of water including: use of storages transfers pumping transmission congestion management quality/treatment optimisation asset management (eg, redundant assets usage when primary assets fail)
System planning	Planning to ensure long-term integrity and adequacy of systems associated with: - Potable supply - Recycled supply - Wastewater - Stormwater	Long-term system planning including: forecasting maintenance scheduling infrastructure planning, augmentation major asset replacement Security of supply standards Security of supply monitoring Security of supply management (responsibilities, accountabilities)

7.2.2 How should this information be managed and disseminated?

In determining how information related to the water and wastewater market should be managed and disseminated, various interests need to be taken into account. For example, market participants (including the incumbents) have an interest in protecting legitimate commercial information. As the Auditor General has noted, the public has an interest in accessing information that underpins the Metropolitan Water Plan, given that the measures being implemented under this plan will have widespread community impact.[70] It is also in the public interest to ensure that the information released does not jeopardise the security of critical infrastructure (for example, by exposing it to a higher risk of terrorism).

As some of these interests are conflicting, clear principles and processes need to be established to ensure these interests are recognised and balanced appropriately. The Tribunal suggests that the following principles be used to guide the management and dissemination of information:

- Information should be clearly identified and categorised as *system* information, *resource* information or *commercial* information.
- In general, all system and resource information should be available for public release. Decisions to hold such information confidential should have clear public interest justification (eg, for security reasons).

70 NSW Audit Office, *Auditor General's Report Performance Audit: Planning for Sydney's Water Needs*, May 2005, www.audit.nsw.gov.au.

- Commercial information should be confidential to its owner, unless it can be shown that there is a clear public interest in making it publicly available without undue harm to the owner of this information.
- There should be regular consultation with market participants on the nature of the system and resource information they require.
- Provided there is a cost benefit justification (for example, there is sufficient demand for the information and it is not excessively costly to collect), system and resource information that is reasonably required by potential and actual participants should be kept up to date and regularly published in an accessible form.
- Costs of collecting system and resource information should be recovered from users, but should not create an undue barrier to entry.

7.2.3 Suggested approach for implementation

Several public authorities hold different system and resource information on Sydney's water and wastewater markets – including Sydney Water, the Sydney Catchment Authority, DIPNR and, in future, the Growth Centres Commission. Currently, this information is brought together in the Metropolitan Water Plan.

The Tribunal notes that the Auditor General has recommended that more detailed information underpinning the Metropolitan Water Plan should be publicly released.[71] The Tribunal suggests that a pragmatic approach for developing and publishing information relating to the Metropolitan Water Plan might be to split the process into two distinct stages.[72]

In the first stage, Sydney Water would prepare and publish a *System Information Statement*, as discussed above. This statement would be a long-term forecast of demand and supply that enables the identification of emerging investment opportunities and the possible timing for new investments.

In the second stage, the Government would prepare and publish detail on the Metropolitan Water Plan itself. This could be expanded to set out water resource information, and to include all committed projects and investigations being commenced by all participants in the market, including new entrants.

Recommendation 9:

That the Government improve arrangements for the collection and dissemination of information about the water and wastewater market to better support private sector participation and innovation, and that the Tribunal have regulatory oversight of information arrangements.

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71 NSW Audit Office, *Auditor General's Report Performance Audit: Planning for Sydney's Water Needs*, May 2005, www.audit.nsw.gov.au.

72 Currently, the Metropolitan Water Plan is scheduled to be reviewed and updated every five years. NSW Government, *Meeting the Challenges – Securing Sydney's Water Future*, The Metropolitan Water Plan 2004, October 2004, p 3.

7.3 Establishing property rights for all water resources

To facilitate the use of all potential water resources, and encourage innovative services that use alternative water resources such as stormwater and sewage, it must be clear who owns these resources. This requires the establishment of property rights for all water resources. Property rights are the basis of the market system. They are a bundle of entitlements that define the owner's right to the use of a resource or asset. For a market to be effective, property rights should be well specified, exclusive, transferable and enforceable.

The need for clear and enforceable property rights for valuable water resources is already well recognised in NSW. Property rights are in place for river surface water and groundwater, which are shared between extractive users under a licensing system.[73] However, property rights for alternative water resources, such as stormwater and sewage, and for alternative storage facilities (such as some natural aquifers and wetlands) are currently not well defined.

7.3.1 Alternative water sources

While responsibility for managing stormwater and sewage is relatively well defined, it is currently unclear who has the right to harvest and profit from use of these potentially valuable resources. For example, when stormwater in urban areas is flowing down a concrete stormwater channel to the ocean, the water is under the control of the entity that owns the infrastructure, which is typically the local council. It could be argued that this water is a public good and that the council is only controlling this potential asset. Alternatively, it could be argued that the council owns the right to harvest and profit from using this asset. There are similar uncertainties about the ownership of sewage.

Clear property rights for stormwater and sewage need to be established to encourage investment in innovative new stormwater reuse and recycling schemes. Failure to recognise the potential worth of recycled sewage and define access rights to it is likely to impede the development of many small-scale sewage treatment technologies that may be suitable for use in large cities.[74] The fact that access to recycled water does not appear to be readily tradeable may also inhibit investment.

Establishing property rights for stormwater and sewage will also avoid the potential for future disputes, which could occur if no property rights are established and investments proceed based on a presumption that the user has the right to use the resource. Such disputes would result in unnecessary costs and could undermine stable and orderly investment processes.

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73 These licences are issued under the *Water Act 1912* or the *Water Management Act 2000*. Under the *Water Management Act 2000*, access licences entitle the holder to a share of available water from a specified water source. These access share entitlements are legally separate from land, they are differentiated based on security (eg, high security and general security), they can be traded subject to the rules of the relevant Water Sharing Plan, and they are divisible (the whole share entitlement or part of it can be traded).

74 Hatton MacDonald and Dyack, *Exploring the Institutional Impediments to Conservation and Water Reuse – National Issues*, CSIRO Land and Water Client Report, 2004, p 15.

7.3.2 Alternative storage facilities

To enable the use of alternative water sources such as stormwater runoff and recycled sewage, there must be facilities to store this water. Possible storage facilities include natural aquifers, urban lakes and wetlands.

In Adelaide, aquifers are being used to store and recover stormwater for municipal irrigation use. Research proposed by CSIRO and the Corporation of the City of Salisbury aims to demonstrate that stormwater stored in aquifers can be recovered at acceptable quality on a sustainable basis.[75] In Melbourne, the potential for aquifer storage and recovery is being assessed and feasible sites for pilot aquifer storage and recovery projects are being identified. Experience in Canberra suggests that stormwater can also be stored in urban lakes and wetlands.[76]

However, in NSW, if water was injected lawfully into an aquifer, it would be unclear who owns the injected water. It could be argued that the injected water is like water held in dam where it is the property of the dam owners, or, alternatively, that it is owned by the Crown. The Government might consider water in an aquifer to be the State's, and that only a right to access the water can be granted.

To encourage investment in feasible storage projects (and hence help maximise the potential for sewage and stormwater reuse) and avoid the potential for future disputes, consideration should be given to establishing property rights for the injection of water into and extraction of water from storage facilities such as natural aquifers.

7.3.3 Suggested approach for implementation

Little work appears to have been done on developing a system of property rights for sewage and stormwater. In some rural areas of Australia, stormwater harvesting is subject to limited controls through the implementation of policies on farm dams and the proportion of catchment run-off that may be harvested. In urban areas, there appears to be some limited precedents for property rights to stormwater. For example, an agreement has been established between Salisbury Council and the Northern Adelaide Plains Barossa Catchment Management Board in South Australia to allow stored stormwater to be sold to commercial users. In Colorado, there is state legislation to administer the beneficial use of reclaimed wastewater, with surface water, groundwater and wastewater all being subject to controlled appropriation.[77]

The Tribunal considers that there is no fundamental impediment to the establishment of property rights for stormwater and sewage, but significant policy development is required. The implementation of such property rights regimes would need to take into account a range of factors, including:

- environmental impacts and the Government's environmental objectives
- the integrated nature of the water cycle (eg, discharges from sewage treatment plants can affect volumes available for "environmental flows" and for extraction by irrigators downstream)

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75 Prime Minister's Science, Engineering and Innovation Council (PMSEIC), 2003, p 6.

76 ibid, p 7.

77 Australian Academy of Technological Sciences and Engineering (AATSE), *Water Recycling in Australia*, May 2004, p 157.

- the measurement and accounting of these water resources
- the fact that the characteristics/quality of stormwater and sewage can vary
- overall consistency in the property rights framework to enable the trading of entitlements to manage region wide variability in resource flows
- security of rights
- mechanisms for allocation.

In particular, the legislation establishing the property rights regime should ensure that the licence creating the property right provides an exclusive right for the holder to fully exploit and deal in the resource, and to sell or divide the ownership, while also enabling the Government to control relevant environmental, planning and health matters.

Property rights to stormwater and sewage could be linked to environmental and health requirements, in much the same way as access licences to surface and groundwater are under the *Water Management Act 2000*. Under this Act, access licences entitle holders to a share of available water (ie, the property right to the resource), while 'works approvals' and water use licences (also issued by DIPNR) impose conditions on the use of this water. Access licences and works approvals are designed to ensure that the objectives of the local Water Management Plan (or "Water Sharing Plan') are achieved.

It would be desirable for property rights to be created before significant decisions or investments are made that may commit important resources. This timing can avoid difficulties that arise when there is private sector involvement and the risk that new legislation will affect pre-existing rights.

The Tribunal intends to further investigate what would be required to develop a robust property rights regime for sewage, stormwater and storage facilities such as natural aquifers, prior to the release of its final report. This will include a consideration of key implementation issues, for example how to adequately measure and account for these resources.

Box 6.2 outlines one proposal for establishing property rights for aquifer storage.

Box 6.2 Rights to aquifer storage

One of the most promising water reuse technologies is the use of aquifers to store water from alternative sources (such as stormwater) until it can be used again. This is done by treating water to a reasonable standard than injecting it into an aquifer, and building/accessing a pipeline to deliver the stormwater to buyers when required. For this to occur, a business that incurs the cost of preparing and injecting the water into an aquifer needs to have an incentive to do so.

One way of creating this incentive is to provide a tradeable property right to the extraction of water from that aquifer at a later point in time. For example, a pragmatic and incentive-focused approach would be to give any person or body that injects water into an aquifer in a non-harmful manner, an entitlement to extract a defined proportion of the volume injected and, if they wish, to transfer the resultant allocation to another party.[78]

78 Hatton MacDonald and Dyack, *Exploring the Institutional Impediments to Conservation and Water Reuse – National Issues*, CSIRO Land and Water Client Report, 2004, p 17.

Recommendation 10:

That the Government establish property rights for sewage and stormwater, and consider establishing property rights for the injection and withdrawal of water from storage facilities such as natural aquifers.

7.4 Ensuring clear and robust guidelines and rules for recycled water are in place

As discussed in Chapter 2, research supplied by the Government suggests that while the community generally supports the idea of using recycled water for non-potable purposes, there is currently a high degree of discomfort with the concept of recycling wastewater for potable uses. Nevertheless, there remains a variety of non-potable urban water demands that could effectively be supplied by recycled water, including outdoor residential and non-potable use (where dual reticulation systems can be incorporated into new developments), urban irrigation (sports fields, public gardens, market gardens, etc), environmental flows and a range of industrial and commercial uses.

To optimise the use of alternative water resources and ensure that the quality of water is appropriately matched to its end use, robust and clear guidelines and rules for recycled water must be place.[79] These guidelines and rules play an important role in guiding potential developers and service providers.[80] Therefore, they should be capable of being applied to a range of different recycling and reuse schemes and uses. They should also keep pace with the evolution of the market, in terms of new sources of and applications for recycled water and new treatment technologies. And they should not raise unnecessary barriers to innovation by private developers and service providers.[81]

Various guidelines for recycled water currently exist. However, they are spread over a number of NSW and national documents, and may not be applicable to all potential uses of recycled water and new treatment technologies.[82] For example, they may not be applicable to all industrial uses, some of which have strict requirements in terms of certain water quality parameters.[83] They may also not be applicable to emerging uses of recycled water (such as stormwater capture and reuse). Researchers have identified a number of gaps and

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79 For the purposes of this report, "recycled water" refers to generic water reclamation and reuse, including stormwater, sewage and greywater.

80 These guidelines also play an important role in protecting and providing assurance to end users. This issue is discussed in Chapter 8.

81 As recognised by the Government's Metropolitan Water Plan 2004.

82 NSW guidelines include DEC's unpublished guidelines for the use of effluent for irrigation; and the *NSW Guidelines for Urban and Residential Use of Reclaimed Water*, which is predominantly applicable to the development of large scale dual reticulation schemes that are centrally managed. In recognition of the need for clear direction for recycling in apartment blocks and other multi-unit dwellings, NSW Health has also recently produced NSW Health Circular 2004/71, which provides interim guidance for grey water and sewage recycling in multi-unit dwellings and commercial premises. At the national level, the National Water Quality Management Strategy document *Guidelines for Sewerage Systems – Use of Reclaimed Water*, which is endorsed by NSW Health, contains information on some other forms of reuse.

83 Due to variations in water quality requirements of different industrial uses, adequate treatment levels must be ensured to avoid problems such as corrosion, staining, scale deposition and foaming (CSIRO, *Wastewater Re-use, Stormwater Management, and the National Water Reform Agenda*, CSIRO Land and Water, Research Position Paper 1, 1997, p vii).

deficiencies in some of the current guidelines, including the national *Guidelines for Sewerage Systems – Use of Reclaimed Water*.[84]

The Tribunal understands that new national guidelines for recycled water are currently being developed,[85] which are expected to address some of these deficiencies, and that NSW guidelines for private sector recycling schemes are also being finalised. However, it believes all the guidelines and regulations for the use of recycled water relevant to NSW should be regularly reviewed, to ensure they are clear, robust and applicable to all sources of and applications for recycled water. These reviews should consider NSW guidelines and national guidelines, including those that currently apply and those being developed that are expected to be released soon. Some important issues to be considered include:

- continuing technological developments, which can contribute to a broader and safer application of reuse water
- community acceptance and attitudes to the use of recycled water, and the potential for these views to change overtime and as circumstances change
- the sensitivity of some industrial uses to particular water quality parameters
- the fact that stormwater quality in particular can vary significantly, depending on site characteristics and local environmental conditions.

Where necessary, new guidelines should be developed in order of priority, starting with those for types/applications of water recycling where there are gaps or no existing guidelines, those where health and environmental uncertainties are the greatest, where innovation is moving fast, and where the greatest potential for substituting for potable water supplies exists. To determine the highest priority options and to draft and refine guidelines accordingly, the Government should consider developing mechanisms to engage stakeholders and to 'test' the market.

Recommendation 11:

That the Government ensure that clear and robust guidelines and rules are in place for all potential sources and applications of recycled water, including for:

- ***the harvesting and use of urban stormwater***
- ***the use of recycled water for a range of key industrial applications***
- ***the use of grey water at both the household level and for larger scale applications and uses.***

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84 According to the Australian Academy of Technological Sciences and Engineering (AATSE, *Water Recycling in Australia*, 2004, 17), the national *Guidelines for Sewerage Systems – Use of Reclaimed Water* provides only limited guidance for use of recycled water in the urban environment, primarily for amenity horticulture. AATSE (2004, pp 131 and 137) also point out that these guidelines are not directly applicable to grey water or stormwater, and that the *Australian Guidelines for Urban Stormwater Management* "do not give adequate consideration to the harvesting and use of urban stormwater as an additional water resource".

85 The *National Guidelines on Water Recycling: Managing the Health and Environmental Risks*, which are due to be released for public consultation later this year.

Recommendation 12:

That guidelines and regulations for the use of recycled water be subject to ongoing review and development to ensure that they are comprehensive, clear and outcomes-focused and that they keep pace with the evolution of the market.

7.5 Ensuring all environmental impacts are adequately factored into decision-making

For the more dynamic market for water and wastewater services to result in more sustainable provision of water services, the regulatory framework needs to provide effective incentives (and no impediments) for the development of innovative water supplies that use alternative sources of water. An important way to create such incentives is to ensure that all the environmental costs of providing water services (as well as all other economic costs) are adequately factored into the production decisions of water services providers and the consumption decisions of consumers.

For example, if the price of water from conventional sources (eg, dams) does not adequately reflect the environmental costs associated with providing this water, then it is likely that this resource will be consumed at a greater than optimal level. A price lower than the true cost of supply can have a series of short and long-term ripple effects throughout the market, which can include impeding the development of alternative sources of water such as stormwater and/or sewage reuse.

The Tribunal believes that as a first step, guidelines for valuing the environmental impacts associated with the provision of water services need to be developed and that these guidelines should be applied by all relevant decision-makers and government agencies. The following sections discuss:

- the environmental costs of water service provision and the current approach to factoring in these costs to production and consumption decisions
- stakeholder views on this issue
- the Tribunal's suggested approach for developing guidelines for valuing the environmental impacts of water service provision.

7.5.1 Environmental costs of water service provision and current approach to capturing these costs

The provision of water services can impose significant costs on society via environmental degradation. In Sydney, these environmental impacts relate primarily to changes in the natural flow of rivers and water quality as a result of water extraction and wastewater discharges. For example, the Hawkesbury-Nepean River is showing signs of substantial environmental stress due to these changes, which will impact on the tourist, agriculture, fishing and recreation industries in the Hawkesbury-Nepean valley.[86]

Currently, the costs of these environmental impacts are primarily factored into production and consumption decisions via the regulatory requirements imposed on the water authorities by DIPNR and DEC. For example, the Catchment Authority is required, under its

86 *Meeting the challenges – Securing Sydney's water future, The Metropolitan Water Plan 2004*, NSW Government, October 2004, p 20.

water management licence with DIPNR, to release a minimum volume of water to the environment ("environmental flows") to help protect the ecological health of the river system.[87] The environmental flow regime is one of a number of factors that determine the amount of water that is available for Sydney's consumptive use, and therefore it can affect the Long Run Marginal Cost (LRMC) of water supply. As the Tribunal has used estimates of the LRMC of water supply as a reference point for setting water usage prices, the environmental flow regime can also affect water prices. In terms of pollutant discharges to the environment, DEC imposes requirements on discharges of wastewater from Sydney Water's sewage treatment plants. The cost to Sydney Water of compliance with these requirements is reflected in prices for its services, via the Tribunal's pricing determination.[88]

The Tribunal is currently further developing its approach to addressing environmental externalities in determining water prices. It intends to publicly release a paper explaining its approach in the near future.

The regulatory instruments used by DIPNR and DEC and the environmental issues that these instruments aim to address are closely related. For instance, both DEC's licence requirements and the environmental flow regime can impact on river nutrient levels. Discharges from sewage treatment plants can also change the natural flow of rivers and act as 'flows' to the environment and downstream irrigators.[89]

7.5.2 Stakeholder views

In recognition of these interdependent relationships, the Hawkesbury-Nepean Catchment Management Authority (HNCMA) argued in its submission to the Tribunal for a more integrated and co-ordinated approach to water management. It believes such an approach should:

- link water extraction and wastewater disposal as parts of the same management cycle
- require an integrated planning and regulatory framework applying to all policy and practice influencing water
- ensure that water pricing acknowledges the impact and cost of the water deficit in the river system and the increasing cost on the river system of the discharge of wastewater. For example, it argued that the cost of aquatic weed outbreaks in the Hawkesbury-Nepean River (a consequence of low flow levels and high nutrient levels) should be reflected in water prices. [90]

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87 As acknowledged in the Metropolitan Water Plan, environmental flows are currently insufficient to maintain river health downstream of the dams and additional water for the environment will be required in the Hawkesbury-Nepean River system to avoid ongoing ecological damage. Consequently, the Government has announced its intention to develop a Sydney Metropolitan Water Sharing Plan, which will allocate a share of available water to the environment and introduce new environmental flow regimes to the rivers surrounding Sydney.

88 The Tribunal has the discretion to determine the efficient level of expenditure necessary for meeting relevant environmental requirements.

89 See Hawkesbury-Nepean Catchment Management Authority's submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region", June 2005.

90 Ibid.

The Hawkesbury River Prawn Trawler Fishers also cited the poor health of the Hawkesbury-Nepean River system, and the impact of this on the oyster industry, as evidence of the need to change the current regulatory arrangements.[91]

7.5.3 Suggested approach for implementation

As a starting point for ensuring that the environmental impacts of water use are adequately captured by the regulatory framework, a robust and consistent approach to quantifying environmental costs and benefits should be developed. Such quantification should be an essential part of all decision-making that affects the water and wastewater industry – including assessing potential projects at the planning stage, setting environmental policy and regulatory requirements, and ensuring that prices are truly cost-reflective. Given the integrated nature of the water cycle, the environmental impacts of water services, and the regulatory instruments that are used to address these impacts, a coordinated and consistent approach across key agencies is required.

The Tribunal recognises that, while there is a range of methodologies and valuation techniques available,[92] the quantification of environmental costs and benefits can be extremely difficult and problematic. Cause-effect relationships can be complex and uncertain, and it can be difficult to translate environmental 'effects' into outcomes or values. Nevertheless, it is important that decisions are made based on methods and information that are as robust as possible. It is unlikely that decisions will be perfect, but once work has commenced on these guidelines, improvements can be implemented over time – consistent with the Tribunal's proposed adaptive management approach to industry reform.

The guidelines for valuing environmental impacts should:

- ensure that key agencies (including DEC, DIPNR and IPART) use a coordinated and consistent approach to value environmental impacts and apply these values to decision-making (including project assessment, policy and regulation setting and pricing)
- be specific to the provision of water and wastewater services in Sydney
- be open to stakeholder input and scrutiny
- be subject to review and decision making processes that are transparent
- provide guidance in identifying the full range of environmental impacts and costs associated with the provision of water services, and ensuring that double-counting does not occur
- detail appropriate valuation techniques, including their strengths, weaknesses and the circumstances in which they should be applied

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91 Hawkesbury River Prawn Trawler Fishers, submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region", June 2005.

92 In general, environmental valuation techniques include direct market methods (eg, improved water quality may result in higher crop yields, which can then be valued directly), 'revealed' preference methods (eg, the 'hedonic pricing' method and the 'travel cost' method) and 'stated' preference techniques (which involve the use of surveys to determine respondent's willingness to pay for a change in environmental quality). In recent times, 'choice modelling' is a well recognised stated preference technique that has been used to value a range of environmental impacts, including those associated with aquatic ecosystems. For example, see Morrison M and Bennett J (2004), "Valuing New South Wales Rivers for use in Benefit Transfer", *Australian Journal of Agricultural and Resource Economics*, 48(1): 591-612.

- provide guidance in applying values (eg, to the assessment of potential projects and policies and the setting of regulatory requirements)
- provide a mechanism for setting consistent parameters, where appropriate
- consolidate all current information and estimates on the environmental costs and benefits of water and wastewater service provision in Sydney, and describe how these are being applied to decision-making
- be able to be updated as new information becomes available and approaches are reviewed.

These guidelines should be developed via an inter-agency approach, with coordination being the responsibility of a single agency. This will enable pooling of existing knowledge, while ensuring appropriate co-ordination. The agencies involved would be key regulators and stakeholders including DEC, DIPNR and IPART. DIPNR and DEC in particular have experience in valuing environmental impacts, primarily as part of their 'in-house' assessment of potential environmental policies and regulations. The guidelines should also draw on other national and international resources and, where applicable, similar guidelines developed in other jurisdictions and for other issues.

Recommendation 13:

That the Government develop guidelines for valuing environmental impacts associated with the provision of water services in Sydney, and require that these guidelines be applied across all decision makers and government agencies (including DEC, DIPNR, IPART and Sydney Water).

8 ENSURING CONTINUED PROTECTION OF CONSUMERS AND THE BROADER PUBLIC INTEREST

Experience in other industries suggests that the introduction of competitive reforms (such as those recommended by the Tribunal) is likely to necessitate change in the existing legal, regulatory and policy framework, to ensure that this framework continues to provide adequate protection to consumers and to the broader public interest. Even when private sector players enter Sydney's water and wastewater market, and a variety of new services are on offer, the Government will retain ultimate responsibility for providing this protection and generally ensuring that the community's economic, social, health and environmental needs are met. [93]

If the Government decides to implement the Tribunal's recommendations on competitive sourcing and an open access regime, the Tribunal believes the following steps should be taken to ensure this continued protection:

- the price of services to both small and large customers should continue to be regulated, and the need for this regulation should be reviewed when a third-party access framework is established and competition in the provision of services to customers emerges
- the legal and regulatory framework should be reviewed to ensure appropriate obligations are placed on incumbents and new entrants in relation to a range of non-price matters, including security of supply, water quality, environmental impacts and customer contracts.

Each of these steps is discussed in more detail below. The potential regulatory implications of private participation in the market for wastewater services, given Australia's membership of the World Trade Organisations' General Agreement of Trade in Services (GATS), are also discussed.

8.1 Continue to regulate prices

In general, the introduction of competition to monopoly utility markets such as Sydney's current water and wastewater market reduces the need for price regulation (which is primarily intended to protect consumers from abuses of monopoly power and encourage efficiency by simulating the effects of competition). However, even in the more dynamic market for water and wastewater services envisaged by the Tribunal, the State-owned water authorities will continue to have significant market power. Because of this power, the Tribunal believes that price regulation will continue to be warranted in most areas. In this sense, comparisons can be drawn to the telecommunications market where Telstra, despite having substantial rivals, continues to be subject to price regulation.

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93 Several submissions made in response to the Tribunal's Issues Paper refer to the continuing importance of the role of Government, notwithstanding private sector participation in the industry. For example, the Public Interest Advocacy Group (PIAC) comments that private sector involvement does not remove a democratic government's ultimate responsibility for the risks to citizens associated with the commercial production of water and wastewater services; the community needs to be confident that Government continues to be publicly accountable for water and wastewater services; and that accountability for key decisions in the industry needs to remain with Government. The Energy and Water Ombudsman of NSW (EWON) state that "consumer protection is of paramount consideration when reviewing future regulatory frameworks and policy directions in water provision."

The Tribunal currently regulates prices for services provided by Government agencies that are declared monopoly services under the *Independent Pricing and Regulatory Tribunal of New South Wales Act 1992* (IPART Act). These services include water, wastewater, stormwater, tradewaste and, in some circumstances, recycled water services.

The Tribunal recommends that it continue to regulate prices for these services to *small* customers for the short to medium term,[94] and to *large* customers for the immediate term. This regulation should be reviewed if or when:

- an infrastructure access framework is established, competing service providers emerge and competition for large customers develops
- new services emerge for small customers, such that customers are freely able to choose the service on a commercial basis.

The current regulatory arrangements for recycled water services are different to those for other services. Where recycled water is provided to large customers on a commercial basis, the prices are not subject to regulation. However, where recycled water services are provided to small customers on a mandatory basis so that the customer is compelled to pay: for connection to the recycled water infrastructure (a daily or service charge); for a minimum volume of recycled water; or a minimum recycled water charge, the prices are regulated. The Tribunal considers that both these arrangements should continue to apply. But if recycled water services to small customers are offered as part of a genuine commercial proposition, then it may be appropriate to adopt a lighter handed approach to price regulation.

In addition, under existing legal and regulatory arrangements, the Tribunal regulates prices for water services provided by Government agencies only.[95] However, consistent with the philosophy and rationale for price regulation set out above, it believes that monopoly services provided by a private sector party (for example, through an exclusive franchise) should also be subject to regulation. As the current statutory framework does not provide for price regulation of services provided by private sector firms, the legal basis for this would need to be established.

Recommendation 14

That the prices of water, wastewater and other related services to small customers continue to be regulated by IPART.

Recommendation 15

That where regulated services are not provided by a government agency, the legal basis for price regulation be established.

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94 Note that regulation of prices may involve setting prices or, as is the case for developer charges, setting a pricing methodology.

95 See Section 11 of the *Independent Pricing and Regulatory Tribunal Act 1992*, which provides the Tribunal with a standing reference to conduct investigations and make reports to the Minister on the determination of the pricing for a government monopoly service supplied by a government agency specified in schedule 1 of the IPART Act.

Recommendation 16

That the prices of water, wastewater and other related services to large customers continue to be regulated, but reviewed if an infrastructure access framework is established and competition for provision of services for large customers emerges.

8.2 Review the legal and regulatory framework to ensure incumbents and new entrants have appropriate obligations

Because water and wastewater services are essential services, the introduction of private sector participation into the market for these services gives rise to a range of concerns for consumers and for society in general. The Tribunal has developed an indicative list of areas where additional protections may be warranted, based on a review of the matters regulated under the current NSW water industry regulatory arrangements, the concerns identified by the UK Government in introducing its competitive water reforms, and the experience of reform in the Australian energy markets. These areas include:

- ensuring security of supply
- ensuring water quality
- managing environmental impacts
- developing, maintaining and extending water and sewerage services
- addressing the potential implications for customer contracts
- allocating responsibilities for coordinating and managing emergencies and matters of national security.

The Government will need to understand the potential impacts of the Tribunal's recommended competitive reforms on each of these areas, and adjust the legal and regulatory framework to ensure that appropriate obligations are placed on both incumbent providers and new entrants. The following sections set out some indicative examples of the issues that may arise in each of the areas.

8.2.1 Ensuring security of supply

Water is an essential service. While the community understands and accepts the need for water restrictions in the event of drought, governments have overall responsibility for ensuring security of supply is managed within clearly defined parameters.

In introducing open access to water and wastewater infrastructure, a series of interrelated questions need to be addressed. The central question is who should be accountable for matching the long-term demand for water with the available supply. Related questions include how should the failure of new entrants be dealt with, and whether customers who leave a new entrant should be entitled to be offered supply by the incumbent service provider.

Current position

Currently, DIPNR leads activity in planning to ensure that long-term water demand and supply are in balance. For example, it was the lead agency in the preparation of the

Metropolitan Water Plan 2004. However, as noted by the Auditor General, no agency has a statutory responsibility to ensure the long-term matching of demand and supply.[96]

Arrangements in England and Wales

In England and Wales, open access based competition in water services has been under consideration since the late 1990s. In this market, new arrangements in relation to security of supply have been developed to protect customers. These arrangements include:

- Each entrant is required to ensure that its inputs into the system and customer demands are matched. The incumbent operates the system in accordance with its overall network operating strategy.
- In some cases, the incumbent may need to control a new entrant's inputs in order to balance the network. This is acceptable, as long as supplies are not interrupted.
- The incumbent is responsible for any supply reliability problems that it causes (eg, through mechanical breakdown). New entrants must ensure that their water resources are sufficient to provide a sustainable supply to their customers. Backstop arrangements oblige the incumbent to supply all customers in its service area if requested.

Experience from other competitive utility sectors

Experience in other competitive utility sectors indicates that the introduction of an open access regime necessitates the allocation of clear 'backstop' responsibility for matching demand and supply in the event of inadequate investment by the market or to address any failure by a new entrant. It is also important to address the issue of 'free riding', which involves a new entrant making insufficient provision for drought conditions and thus obliging the Government to step in to protect customer interests, for example in the event of severe drought.

Experience indicates that establishing appropriate regulatory and pricing arrangements to ensure security of supply is likely to raise complex issues. These issues are also likely to be more complex for the water industry than for the electricity and gas industries, because of the uncertainties associated with drought and the high costs of managing drought risk.

Options

There are several options for establishing 'backstop' responsibility for ensuring security of supply. One approach, which is used in competitive utility sectors such as electricity, is to manage this backstop responsibility centrally. One advantage of this approach is that it creates competitive neutrality between the incumbent and new entrants. However, it also creates the need for new organisational arrangements, and therefore can be complex.

Another approach is to impose 'security of supply' obligations on all market participants.[97] For example, in the Greater Sydney region, the separation of the bulk water supplier (the Catchment Authority) from the water retailer (Sydney Water) would make it possible to create tradeable Bulk Water Entitlements. For example, tranches of high security bulk entitlements to the Catchment Authority's storages could be established, and all participants

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96 NSW Auditor General, *Planning for Sydney's Water Needs*, Auditor-General's Report, Performance Audit, May 2005.

97 In gas and electricity in the United States, it is common to impose a security of supply obligation on individual players. In electricity, this is known as a "Capacity Obligation".

could be obliged to hold a certain percentage of high security entitlement that matches their customer profile or pay a high penalty if they fail to do so. This approach would enable security of supply to be taken into account when trading in Bulk Water Entitlements.

A third approach may be possible following the construction of a desalination plant by the Government. It might then be appropriate for this plant to form the basis of 'security of supply' contracts between each participant and the party that has the rights to dispatch the desalination plant.

A fourth and simpler approach would be to allocate clear backstop security of supply responsibility to the incumbent water authority (Sydney Water). The incumbent would be responsible for providing services to all customers in its service area, including when a new entrants fails or customers choose to leave a new entrant. It should be entitled to recover reasonable costs for the provision of this service through access negotiation and arbitration.

Tribunal's suggested approach

The Tribunal's current thinking is that the fourth approach described above would be most suitable in establishing the initial open access arrangement for water and wastewater services. That is, a clear backstop security of supply responsibility should be allocated to the incumbent water authority.

This approach is the same as the one adopted in England and Wales. Its main advantages are that it is relatively simple, and avoids any immediate requirement to establish new organisational arrangements. Given the lack of experience with open access regimes in the water and wastewater industry, and the current uncertainty about the demand for open access, it seems premature to consider establishing a more complicated arrangement. Further, provided the incumbent recovers reasonable costs for the provision of this service through the access negotiation and arbitration process, this approach guards against the risk of 'free riding'.

If there is clear evidence that there will be significant demand for open access and that it is likely to play a significant role, then security of supply responsibilities should be reviewed. This review should be undertaken in light of experience and changing circumstances (for example, decisions on a desalination plant). This review would consider alternative approaches such as those noted above.

The Tribunal intends to do further work to consider any legislative and statutory implications of security of supply arrangements prior to publishing its Final Report. It will also explore how such arrangements may fit with the current approach to security of supply management by government agencies.

8.2.2 Ensuring water quality

The establishment of more competitive arrangements may lead to the introduction of new water sources, the mixing of water of different qualities at different points of the water system, and an increase in the use of recycled water. This means that close attention will need to be paid to water quality, to ensure that customers are protected.

If there is a risk that poor quality water will enter the potable system and be delivered to customers, the legal and regulatory framework may need to be adjusted to ensure that:

- new entrants inject water that meets statutory standards
- there is clear accountability for ensuring that mixing of waters does not result in lower water quality for customers and is acceptable to customers
- new entrants bear the reasonable costs of prudent monitoring and sampling of the quality of water they inject into the incumbent service provider's system
- the respective liability of incumbent providers and new entrants are clear. (For example, in England and Wales, incumbents bear primary responsibility for the quality of water supplied. To the extent that a new entrant injects water that gives rise to problems, the access contract should include appropriate penalties.)

8.2.3 Managing environmental impacts

Chapter 7 discussed the need to ensure that environmental impacts are adequately accounted for and factored into decision-making.

The overall regulatory framework for the water industry should support future decisions and trade-offs made by Government in relation to the environment, and oblige all service providers to give effect to the Government's environmental decisions.

It is also important that the regulatory framework recognises the integrated nature of the water cycle and the environmental impacts of water services; and that regulatory agencies adopt a coordinated approach to environmental issues. In its submission to the Tribunal, the Hawkesbury-Nepean Catchment Management Authority stressed the importance of adopting an integrated water cycle management approach to addressing "key issues challenging the sustainable management of the Hawkesbury-Nepean River." It also argued that while DIPNR water sharing plans, DEC pollution licensing, IPART pricing policies, DIPNR extraction licences and water supply authority operations all impact on river conditions, "there is currently no regulatory framework which takes these interrelationships into consideration across the different service providers."[98]

As discussed in Chapter 9, the Tribunal suggests that basic principles to guide the regulation of new private or public sector entrants and activities in Sydney's water and wastewater industry should include that "no service provider or activity should have an adverse impact on public health, safety or the environment" and that "risks should be identified and managed effectively".

8.2.4 Developing, maintaining and extending water and sewerage services

Currently, Sydney Water (as provider of the existing water infrastructure) has 'public benefit' regulatory obligations in relation to system planning and operation. Decisions will need to be made about whether these obligations should continue when new retailers enter the market, or whether they will be limited to contractual obligations to new entrant retailers.

98 Hawkesbury-Nepean Management Authority, submission to the Tribunal's "Investigation into Water and Wastewater Service Provision in the Greater Sydney Region", June 2005.

8.2.5 Addressing potential effects on customer contracts

The experience of competitive reform in the Australian energy sector suggests that the introduction of competition has some potential implications for customer contracts that will need to be considered and addressed. For example:

- Customers and water companies will need to understand the direct implications for them of changed contractual arrangements and risk allocations. For instance, where competition allows a customer to change retailer, are there any continuing rights and obligations owed directly between the customer and network company in relation to asset maintenance and access?
- How are the costs for any 'public benefit' obligations allocated and recovered?
- Should a supplier of last resort scheme be established, given that water and wastewater services are essential?

8.2.6 Allocating responsibility for managing emergencies and national security matters

In energy reforms, and in UK water reforms, it has been necessary to create additional regulatory and contractual obligations to allocate primary responsibility for co-ordinating and managing emergencies, and to require new entrants to co-operate, provide information and participate in emergency planning and co-ordination exercises.

Recommendation 17:

That the Government ensure appropriate regulatory obligations are placed on incumbents and new entrants to protect consumers and the public interest in relation to ensuring security of supply, ensuring water quality, managing environmental impacts, developing, maintaining and extending water and sewerage services, addressing potential effects on customer contracts, and allocating responsibility for managing emergencies and national security matters.

8.3 Potential regulatory implications of reform and GATS

The General Agreement on Trade in Services (GATS) is a multilateral treaty to which the Commonwealth of Australia is a party. GATS came into force on 1 January 1995, and is subject to ongoing negotiations between member states, with a view to developing the treaty and widening its application. GATS is focused on market access in services trade and removing unnecessary barriers to trade.[99]

In its submission to the Tribunal, PIAC pointed out that Australia's membership of GATS may have implications for plans to introduce competition in Sydney's wastewater industry (see Box 8.1). The Tribunal has considered the issues raised by PIAC and notes that water and wastewater services are not subject to the requirements of GATS to the extent that they remain "services supplied in the exercise of government authority"; and that under Australia's (as yet non-binding) offer, "the supply of water for human consumption" shall remain a service that is excluded from Australia's GATS commitments – regardless of the degree of private sector involvement that may occur in the future". By contrast, should the NSW Government decide to allow private sector participation in the delivery of Sydney

[99] Australian Department of Foreign Affairs and Trade, Fact Sheet: Services Trade in Multilateral Negotiations, http://www.dfat.gov.au/trade/negotiations/gats_factsheet.pdf.

wastewater services, then that service may no longer meet the definition of a "service supplied in the exercise of governmental authority" under Article 1 of GATS, and if so would fall within the scope of the treaty. The wastewater sector could then become subject to binding commitments on market access and national treatment under GATS, if both of the following situations occurred:

- Australia does not withdraw its 'Revised Offer'[100] prior to the conclusion of the current round of negotiations.
- The conditions specified in Australia's 'Revised Offer' are fulfilled.

Once they are binding, GATS commitments cannot be modified without providing compensation to affected trading partners. Should Australia's Revised Offer become binding, GATS will constitute an additional, overarching component of the legal/regulatory landscape for wastewater regulation and Australia would be obliged to ensure that any 'measures' taken by central, regional or local governments and authorities observe applicable GATS requirements.

The Tribunal's current thinking is that Sydney's wastewater market would remain heavily regulated if it were opened to private sector involvement. GATS could conceivably reduce the discretion that the NSW Government may otherwise have to regulate this market – in that it would be indirectly obliged to implement legal or administrative 'measures' that were consistent with GATS principles, including the 'Market Access' and 'National Treatment' provisions of Part III of GATS.[101]

For example, certain legislative or administrative (including licensing) measures designed to serve environmental, social or other policy objectives could become the subject of 'consultations' between an objecting foreign Member State and the Australian Government, or elevated to the Word Trade Organisation dispute resolution mechanism pursuant to PART V of GATS.

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100 On 26 May 2005 the World Trade Organisation recorded Australia's "Revised Services Offer", whereby the Australian Government offered to extend the coverage of GATS for the purposes of the Doha round of negotiations. This "Revised Offer" states: "Australia reserves the right to withdraw, modify, or reduce this revised offer in whole or part, at any time prior to the conclusion of the negotiations. In the areas of environmental services, legal services and freight logistics, the Australian offer draws upon recent proposals for greater liberalisation and/ or for a revised approach to the classification of services. It is noted that these aspects of the Australian offer are conditional upon the degree of liberalisation proposed in the same sectors in the offers of other WTO Members. In addition, their final form may vary depending on progress in the Doha Round on consideration of classification issues." Australia's Schedule (Sector 6, "Environmental Services") to this Revised Offer includes the following: **6A Wastewater management** – "This covers removal, treatment and disposal of household, commercial and industrial sewage and other waste waters including tank emptying and cleaning, monitoring and removal of solid wastes." **6B Waste Management** – "This covers hazardous and non-hazardous waste collection, treatment and disposal (including incineration, composting and landfill) sweeping and snow removal, and other sanitation services." Australia's Schedule for sector 6 notes that "The Australian offer on environmental services excludes the provision of water for human use, including water collection, purification and distribution through mains".

101 Part three of GATS contains two important treaty provisions that effect the liberalisation of trade in services. Article 16: Market access – Members must not maintain or adopt quota limitations, other value or numerical limitations on service transactions, economic needs tests and shareholding limitations. Exceptions are permitted if measures are listed in the schedule of specific commitments. Article 17: National treatment – the national treatment principle requires that Members accord to services and service suppliers of other countries treatment no less favourable than that accorded to its own services and suppliers. Laws and regulations must not be used to make foreign firms less competitive in the domestic market.

In that forum, Australia would have to rely on exceptions under GATS and/or principles of international trade law to justify its departure from (for example) PART III principles. Were the Commonwealth minded to remedy a conflict (or potential conflict) with Australia's GATS obligations, it could rely upon the external affairs power of the Commonwealth Constitution to support Commonwealth legislation overriding State measures and giving domestic effect to Australia's GATS obligations.

Box 8.1 PIAC's submission in relation to Australia's membership of the World Trade Organisations' General Agreement of Trade in Services (GATS)[102]:

"Australia agreed to include sewerage services and wastewater management in the GATS, but 'water for human use' and 'public services' are both exempt under Australia's GATS commitment (Trade Minister Vaile, media release MVT 42/2005). Australia's GATS commitment excludes the provision of water for human use, including water collection, purification and distribution through mains. The reason for this exclusion is that both Federal and State Governments recognise that governments must have full flexibility to regulate water services to ensure both equitable access and environmental sustainability. If water services were included in the GATS, government regulation would be subject to international trade law, and could be challenged by other government on the grounds that it was burdensome to business or a barrier to trade.

"However, the definition of a 'public service' under GATS includes services carried out in exercise of governmental authority and provided neither 'on a commercial basis nor in competition with a service provider' (GATS Article 1.3). In other words, wastewater services remain outside the reach of GATS so long as they remain a strict 'public' service. If the NSW Government permits greater private sector involvement in wastewater treatment, it could be exposed to the limitations of international trade law and reduce its ability to regulate this industry."

102 PIAC, submission to the Independent Pricing and Regulatory Tribunal "Review of the Water and Wastewater Industry in the Greater Sydney Region", June 2005, p 9.

9 IMPLEMENTING REGULATORY CHANGE

As the previous chapters discuss, the Tribunal recommends a range of changes be made to the existing legal and regulatory framework for the water and wastewater industry. Some of these changes flow from the Tribunal's other recommendations, such as the recommendation to establish State-based access regime for infrastructure (see Chapter 4). Others are needed to facilitate the market changes envisaged by the Tribunal, and to ensure that when these changes occur, consumers and the broader public interest continue to be adequately protected (see Chapters 7 and 8).

The Tribunal has considered several possible approaches for implementing the required regulatory changes. It believes that an 'adaptive management' approach is likely to be most effective, given the specific context of Sydney's water and wastewater industry. Under an adaptive management approach, the first step would be to establish a set of basic principles and features for the revised regulatory framework, and use the principles to guide and direct short-term decisions made under the existing framework. The next step would be to use the principles and features to guide a review of the existing framework and the subsequent development a revised regulatory framework that is robust, flexible and overarching.

It is important to note that when existing regulated entities (such as Sydney Water) procure services from external contractors, the integrity of the existing regulatory regime is not threatened, because the regulated entity retains primary responsibility for meeting all its regulatory obligations related to the contracted services. (It can also require its contractor to meet these obligations, by reflecting them in the terms and conditions of their commercial contract.) However, when private players deal directly with customers (for example, where a recycled water provider signs a contract with a large industrial customer), then the regulatory regime should expressly apply to those private players.

The following sections describe the Tribunal's recommended approach to implementing regulatory changes, and its recommended principles and features for a robust and flexible revised regulatory regime.

9.1.1 Adaptive management approach to regulatory change

The Tribunal identified three possible approaches that could be taken to implement its recommended regulatory changes. The first is to undertake piecemeal, ad hoc amendments to the existing regulatory framework, to facilitate individual developments on a case-by-case basis. The second is to conduct a rigorous review of the overarching legal and regulatory framework, and defer all decisions until comprehensive reforms are completed. The third is to apply an adaptive management approach by first establishing the basic principles and features of the revised legal and regulatory framework, then:

- using the principles to guide short-term decisions on the water and wastewater industry made under the existing framework
- using the principles and features to guide and direct a comprehensive review of the existing framework and the subsequent development of a robust and flexible revised framework.

The Tribunal considered each of these options. In relation to the first approach, it found that implementing regulatory changes in a piecemeal way, using successive 'add-ons' to specific

areas of the regulatory framework would pose significant risks – particularly as the regulatory framework for water management in Sydney is complex, and involves several ministerial portfolios spanning health, safety, planning, the environment, economic regulation and shareholder interests.[103]

Accommodating new players and activities through add-ons to the existing framework would present real challenges in ensuring that changes do not create new conflicts, or work at cross-purposes, omit important links or requirements, or result in inefficient duplication. In addition, ad hoc changes that increase complexity or ambiguity can create additional public costs and risks, and the Government rather than the private sector will be required to take measures to address these risks. The potential costs include inefficient regulation, regulatory uncertainty, stifled innovation, stifled or inappropriate investment, or inappropriate risk allocation.

In relation to the second option – conducting a rigorous review and deferring all decisions until comprehensive reforms are complete – the Tribunal found that this approach would not provide guidance for necessary short-term decisions about the water and wastewater industry—such as decisions about desalination or the new growth areas. This creates the risk that decisions made in the short term will be inconsistent with the revised regulatory arrangements when they are complete. This inconsistency may lead or contribute to:

- failure or reduced ability to achieve the objectives of efficiency, effectiveness and sustainability
- distortions, conflicts or inequities between current and future industry participants
- investor confusion or lack of confidence
- customer inequities and differences in pricing
- property rights that are inconsistent
- process inefficiency (duplication, inconsistency, compliance complexity or costs)
- long-term contracts that cannot be accommodated readily within revised regulatory arrangements or that could undermine water objectives.

New players are already entering the water and wastewater market. Desirable regulatory amendments may not be in place when decisions are made and investments committed. In addition to the risks outlined above, the Tribunal notes that changing regulatory obligations or risk allocation *after* private sector involvement can be more complex and problematic, especially where changes affect private sector interests and rights. Those risks can be mitigated by a clear advance indication from Government of the nature of proposed changes. (Although the Tribunal does recognise that Government policy can change and that therefore there are may be some instances where it is appropriate or unavoidable for regulatory requirements to change *after* private sector involvement).

For all of the above reasons, the Tribunal believes that that the third option, applying an adaptive management approach to regulatory change, will be the most effective. This

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[103] It also has many specific purpose acts and regulations, different instruments and different decision makers and administrative processes. For example, in its submission to the Tribunal's Issues Paper, the Hawkesbury-Nepean Catchment Management Authority points out that that DIPNR water sharing plans and extraction licences, DEC pollution licensing, IPART pricing policies and water supply authority operations all impact river conditions.

approach will allow the Government to send directional signals on the legal and regulatory framework as soon as possible, which is important for the long-term coherence and effectiveness of industry arrangements. These signals, or regulatory principles, should inform private sector participants and, in the short term, provide an overarching guide to decision-makers in Government agencies, pending finalisation of reforms. An adaptive management approach will also allow the Government to define the key features and characteristics of the future regulatory framework in a relatively short time. Along with the principles, these features should be used to guide and direct a comprehensive review of the existing framework and the subsequent development of the revised framework.

9.2 Principles and features of a robust and flexible regulatory framework

The Tribunal has considered what basic principles should be used to guide short-term decision making in relation to the regulation of new private or public sector entrants and activities in Sydney's water and wastewater industry, and guide the review and development of the revised regulatory framework. It has also considered what additional principles, features and characteristics should guide the development of revised regulatory framework.

9.2.1 Basic principles

The Tribunal reviewed Government objectives, recent experience in the reform of the United Kingdom's water industry and Australia's energy sector. Based on this review, it developed a set of basic principles aimed at supporting competitive neutrality, protecting the public interest and promoting regulatory efficiency. These principles are that:

- *No service provider or activity should have an adverse impact on public health, safety or the environment.*
- *No service provider or activity should have an adverse impact on the overall integrity of water or waste water systems, system operation, or security of supply.*
- *Risks should be identified and managed effectively.*
- *All regulated entities should be subject to the same transparent rules, regulations and policy objectives.*
- *The above principles should apply unless there are sound public policy reasons to the contrary.*

Recommendation 18:

That the Government adopts the Tribunal's suggested basic principles for the revised policy and regulatory framework, and use those principles to guide and direct:

- ***short-term decisions in the water and wastewater industry made under the existing framework***
- ***a comprehensive review of the existing framework and subsequent development of the revised regulatory framework.***

9.2.2 Additional principles, features and characteristics

The Tribunal believes that, in addition to the principles discussed above, the review and development of the revised regulatory framework should be guided and directed by the principles of best practice regulation, the National Competition Reform principles, and a range of desirable features and characteristics.

Principles of best practice regulation

In review and developing the revise regulatory framework, the Government should aim for consistency with the accepted principles of best practice regulation. These principles include transparency, accountability, targeted regulation, consistency, and proportionate regulation.

For new statutory requirements, and in evaluating the existing regime, it will be important not to simply follow precedents. Instead, the best long-term results will be achieved by systematically working through the principles of good regulatory design.

Indicatively that process would entail:

- Testing the need for regulation in each instance (or whether alternatives to regulation would be more efficient and effective).
- Determining who is best placed to act as regulator, and then ensuring.
  - an efficient allocation of roles and responsibilities
  - appropriate powers and governance arrangements to support those roles
- Testing the best instrument and decision-making processes in each instance, and using regulatory precedents only where appropriate in the particular water and wastewater circumstances.
- Concentrating on the first order issues necessary to establish and structure the framework. Many details will be more appropriately addressed later by delegated decision-makers within the context of the broader regulatory framework. Examples of such details include IPART guidelines and (regulated) industry contracts.

National Competition Reform principles

It will also be important to adhere to the accepted principles of National Competition Reform. These principles relate to separation of regulatory functions from service provision, and use of regulation that is not restrictive of competition.

Desirable features and characteristics

The Tribunal considers that the review of the overarching regulatory framework should seek to establish a regulatory regime that has the following specific features and characteristics:

1. Consistent application throughout the state

Though some regional and metropolitan organisational differences will continue, there are many areas where measures to improve efficiency, effectiveness and sustainability can and should be applied consistently across the State. Consistency should be promoted unless there are sound public policy reasons for divergence.

2. Clear principles for decision-makers

There should be clear objectives and priorities to assist decision-makers and stakeholders in resolving any conflicts between competing objectives. Regulatory objectives may be streamlined to reduce ambiguities that give rise to legal challenges of regulatory decisions.[104]

3. Flexibility and adaptability to apply readily to any new entrant

A dynamic regime should not require new legislation each time a new entity wishes to provide water or wastewater services, or to perform a new activity in the industry. All aspects of the regime should provide appropriate, flexible regulatory mechanisms to regulate the activities of private service providers (including private networks), new statutory authorities, or any other type of entity that may in the future be able to provide water and wastewater services. Generally, it will be preferable to regulate activities, rather than named persons.

Similarly, administrative mechanisms should be responsive to change and development, including changing physical conditions over time, changing public preferences for water quality and resource management, and new technical options. Flexible instruments should create regulatory 'hooks', which empower an appropriate decision-maker to impose targeted regulatory obligations on a prospective service provider.

The Tribunal has recommended an adaptive management approach to reform of the water industry. In the legal and regulatory framework context, this approach would be supported by building future review points into the framework and specifying at the outset criteria that would suggest the need for change.

4. Seamless application to all activities and functions

Any ambiguities, inconsistencies or gaps in regulation are more likely to be exploited in the commercial interests of private sector participants, than is the case for government-owned entities. A holistic approach is necessary to ensure consistency across health, planning, environmental and economic regulation. There must be clear and explicit assignment of responsibilities, accountabilities, and administrative processes.

5. Exceptions or exemptions in the public interest

The regulatory framework should allow for exemptions or exceptions from strict requirements, but only in clearly defined, public interest circumstances. It is difficult to apply a rigid set of regulatory arrangements that will be efficient and effective in all instances. Experience in other industries suggests that an exemption or exception mechanism can best balance the need for certainty and flexibility, while meeting accepted standards for regulatory best practice such as transparency, consistency and proportionality.

The principles set out in section 9.2.1 above imply that the rights and obligations of new service providers should be the same as those that apply to an incumbent in relation to a specific activity, unless there are sound public policy reasons to the contrary. In the water and wastewater industry, possible public policy reasons for variations from generic rights and obligations include:

- risk allocation decisions, such as a policy decision to retain primary responsibility or accountability for overall system integrity, security of supply or other matters with a government–owned entity

104 For example, Government may consider revising the IPART Act s15(1) objectives.

- unsuitable rights and powers, such as land acquisition or access rights, or enforcement rights against private citizens, that may be inappropriate for private entities
- regulatory cost/ benefit impact analysis of a particular circumstance supports an exemption.

Indicatively, exemptions from economic regulation in the water and wastewater industry could apply to allow new franchises, mechanisms other than regulation to set retail prices, or 'access holidays'.

Recommendation 19:

That the Government, in reviewing the existing framework and developing the revised legal regulatory framework, also take into account:

- ***principles of best practice regulation***
- ***national competition reform principles***
- ***desirable features and characteristics such as consistent application throughout the state; clear principles for decision-makers; flexibility and adaptability to apply readily to any new entrant; seamless application to all activities and functions; and provision for exceptions that are in the public interest.***

10 NEXT STEPS

If the Government decides to accept the Tribunal's recommendations, their implementation will involve significant change to the market for water and wastewater services in the Greater Sydney area, and to the regulatory and other arrangements for these services. Experience of competitive reform in other industries suggests that the effectiveness of this type of reform depends significantly on the approach to implementation. For instance, establishing clear commitments and timelines for change can minimise the risks of regulatory uncertainty, stifled innovation and investment, or inappropriate investment and risk allocation.

The Tribunal believes that a well-managed and effective implementation process will involve:

- coordinating key participants in the water industry, reviewing reform proposals before they are put to government, and monitoring the progress of implementation
- ensuring that the implementation decision-making processes are open, transparent and effectively manage vested-interest positions
- establishing a central agency or unit for initially one year that is responsible for managing and driving the reform process, and is accountable to a Cabinet Committee
- preparing a reform implementation plan, which addresses issues such as the sequencing of reform, and which should be reviewed and updated by the central agency as appropriate.

Each of these matters is discussed in more detail below.

10.1 Coordination, review and monitoring

As part of an effective process, the implementation of the Tribunal's recommended reforms should involve the coordination of Government agencies and industry players to carry out a range of tasks, the review of reform proposals before they are formally recommended to Government, and monitoring of the progress of implementation.

Coordination responsibilities would include:

- facilitating Government decisions on the appropriate prioritisation and sequencing of implementation steps and decisions
- identifying responsibilities, accountabilities and resource implications for undertaking various implementation tasks, and
- establishing timelines and deadlines for decision making.

Review responsibilities in relation to the new legislative and regulatory arrangements would include:

- ensuring that appropriate consultation and communication occurs with industry, stakeholders and the community
- considering whether various detailed proposals are sufficiently robust and whether further work or expert review is required

- ensuring that work is undertaken to identify and develop appropriate responses (and obligations) to manage operational impacts of new developments.

Monitoring of progress would include:

- reporting to Government on progress against implementation timelines
- identifying and facilitating resolution of difficult issues and problems
- anticipating and addressing implementation delays.

10.2 Open, transparent and independent decision-making

Implementation decision-making processes need to be open and transparent, particularly with the introduction of private sector players.

Regulatory obligations will need to be imposed on new players, and the responsible agencies need to work closely with the private sector players to ensure the effectiveness of detailed implementation of these obligations. Private sector players have a legitimate interest in being involved in commenting on the details of the new arrangements.

Decision making also needs to be balanced and independent, and guard against 'capture' by the vested interests of either incumbents or new entrants.

10.3 A central agency to implement reform

Currently, Sydney Water and the Catchment Authority are the two main players in the Greater Sydney metropolitan water industry, although a Growth Centres Commission water authority may evolve to become a third major player. In addition, a range of Government bodies are involved in providing policy advice and regulating the water industry. These include IPART, DIPNR, DEC and NSW Health. Treasury, The Cabinet Office and Parliamentary Counsel would also be involved in any decisions about regulatory reform.

Implementation could be carried out through cooperation between the various bodies. However, the Tribunal considers there is a significant risk that this option would result in:

- a lack of clear accountabilities for driving the reform process
- insufficiently open and transparent decision making
- a perceived (or real) lack of balance and independence in decision making.

The Tribunal believes that a better option is for the Government to assign responsibility for implementation to a central agency reporting to a Cabinet Committee. Experience in implementing reforms in other jurisdictions and industries indicates that there are real benefits in establishing a central agency to coordinate implementation (Box 10.1).

Box 10.1 Experience in implementing reforms

Electricity
Electricity sector reform was complex, but is widely considered to be successful. All State governments (including NSW) have at different times established central agency responsibilities to coordinate electricity reform programs. An important benefit of this approach was that it:

- facilitated clear accountability for driving reform
- enabled implementation decision-making to more effectively draw on the limited available industry expertise – for example, through secondments of industry experts to the central agency and the establishment of industry committees and working groups.

National Water Reform
The Commonwealth and State Governments recently established the National Water Commission (an independent statutory body in the Prime Minister's portfolio) whose role is to "drive the national water reform agenda". While it is too early to determine the success of the National Water Commission, it illustrates that there are perceived advantages of establishing a central reform coordination and leadership organisation that does not have 'line' responsibilities in day-to-day policy advice, regulation or service delivery.

The Tribunal envisages that the agency would be staffed by a mix of personnel with relevant general experience and seconded staff with appropriate water industry expertise, supported by consultants where appropriate. The agency would be accountable for co-ordinating the implementation program and reviewing and monitoring progress. The bulk of the detailed development work would probably be allocated to the relevant agencies and water bodies. The central agency should have a life of one year, initially, and be dissolved once its responsibilities have been completed.

Recommendation 20:

That the Government establishes a central agency for one year, initially, which will report to a Cabinet Committee and be accountable for co-ordinating implementation of reform and reviewing and monitoring progress.

10.4 Reform implementation plan

If the Government decides to accept (or substantially accept) the Tribunal's recommendations, the Tribunal believes that one of the logical next steps is to prepare a *Water and Wastewater Service Reform Implementation Plan for the Greater Sydney Region* (Reform Implementation Plan). This plan would form the basis of the management arrangements discussed above. The central coordination agency (discussed above) would then progressively review and update the Reform Implementation Plan as appropriate.

A range of factors would need to be addressed in developing this plan, including the following:

- The key components of the recommendations accepted by Government should be 'locked in' as soon as possible. A clear, shared vision and committed timeline for changes can minimise the risks of regulatory uncertainty, stifled innovation, stifled or inappropriate investment, or inappropriate risk allocation.

- If the Government wishes to consider particular areas further, then these should also be clearly identified. As decisions are made, the strategy vision should be progressively clarified.
- Implementation should proceed in accordance with a pragmatic approach and timetable that recognises the magnitude of potential improvements that may be gained, the relative ease of effecting change, and a logical sequencing of decisions.
- Those initiatives that have the potential to achieve material improvements and involve less effort should be prioritised for implementation as soon as practicable. An example is competitive sourcing.
- Those initiatives that are important long-term enablers, but which may take longer to develop (for example, a State-based access regime), should be scheduled for development and subsequent implementation.

One logical sequence would be to:

- First, establish the basic principles and features of the policy and regulatory framework (see Chapter 9)
- Second, progress initiatives that can make material improvements for little effort (eg, Sydney Water competitive sourcing)
- Third, progress matters that are important long-term enablers, but which take time to develop (for example, a State-based access regime).

Recommendation 21:

That the Government develops an implementation plan that includes a clear vision for reform, an outline of the immediate next steps and appropriate sequencing for subsequent areas of work.

Recommendation 22:

That the Government progresses implementation in accordance with a pragmatic approach and timetable that recognises the magnitude of potential improvements that may be gained, the relative ease of effecting change, and a logical sequencing of decisions.

APPENDIX A TERMS OF REFERENCE

Sydney Water Corporation is the statutory State-owned corporation responsible for delivering water and wastewater services to customers in Sydney, the Blue Mountains and the Illawarra. Since corporatisation, Sydney Water has made significant efficiency gains, leading to lower prices for its customers. At the same time, Sydney's demand for water now exceeds the sustainable yield of its catchment. The Government has developed the Metropolitan Water Plan which outlines a mix of actions which will deliver a long-term balance between supply of and demand for water. A key element of the Plan is encouraging the involvement of the private sector in developing innovative solutions to Sydney's water problems. These developments have important implications for the pricing of water and wastewater and for the structure of the water and wastewater services industry.

1) The Independent Pricing and Regulatory Tribunal (IPART) is requested, under section 9 of the *Independent Pricing and Regulatory Tribunal Act 1992,* to investigate and provide advice on possible pricing principles and alternative arrangements, including possible private sector involvement, for the delivery of water and wastewater services in the greater Sydney metropolitan area, with a view to making recommendations for providing these services in the most efficient, effective and sustainable way.

2) In conducting the review and developing recommendations, IPART is to

   I. Have regard to:

      i. The principles of integrated water cycle management;
      ii. The roles and responsibilities of participants in the industry, both Government and private sector;
      iii. Approaches taken in other jurisdictions to the pricing and delivery of water and wastewater services;
      iv. Recent reforms in other industries with similar characteristics;
      v. The costs and benefits of alternative industry structures, including transitional costs that may be incurred in changing to a new structure;
      vi. The principles for pricing, including pricing for recycled water, that should be associated with existing and alternative industry structures;
      vii. The principles for access that should be associated with alternative industry structures;
      viii. Mechanisms for implementation of the pricing and access principles;
      ix. Any impacts (including service provision, operational or financial impacts) on existing asset owners and operators;
      x. Any impact on customers and in particular any differential impact on large families or low income households, and how these may be addressed;
      xi. Any impact on human health; and
      xii. Any impact on the environment.

   II. Consult with Government, the water and wastewater industry, water and wastewater customers, and other interested parties.

3) IPART is to provide a final report to the Minister for Energy and Utilities within 9 months of receipt of these Terms of Reference.

APPENDIX B EFFICIENCY, COMPETITION AND UNBUNDLING

In general, the experience in other jurisdictions suggests that, where it is feasible, competition encourages efficiency and innovation, and is preferable to regulation. In evaluating the various options for the structure of the water and wastewater industry in Greater Sydney, the Tribunal has considered the trade-off between the productive efficiency that can result from the economies of scale and scope associated with one vertically integrated service provider, and the dynamic and productive efficiency gains that can be achieved through increased competition (net of any transaction costs and transition costs). Box B.1 below explains these concepts.

Box B.1 The role of industry reform and competition

According to economic theory there are three types of efficiency – technical or productive efficiency, allocative efficiency and dynamic efficiency.

Productive efficiency is said to be achieved when a given output is produced at minimum possible cost, given the available production technology and input prices. This type of efficiency is relevant to the goal of delivering water and wastewater services at the lowest possible cost to the consumer. Competition, where feasible, is one means by which firms can be forced to produce and price goods and services at the least possible cost to consumers. Incentive-based regulation is another means for encouraging productive efficiency for services provided by a monopoly business.

Allocative efficiency is maximised where resources are allocated so that the value in the use of the product at the margin is equal to the increment in the cost of supplying the product at the margin, including any external costs and benefits from the activity. The necessary rule can be summarised as the application of marginal cost pricing. Competition, where feasible, is one means of encouraging allocative efficiency, as firms that can use resources more productively bid them away from others. Allocative efficiency for monopoly services can be encouraged through the process of setting regulated pricing structures.

Dynamic efficiency relates to processes of technological and managerial innovation – the ability of producers to improve the quality and cost of their goods and services and to respond to emerging market developments. Such efficiency gains are particularly attractive when dealing with an increasingly scarce and valuable resource such as water. Removing artificial regulatory barriers to entry may be important in promoting the investigation and commercialisation of new water sources, or the more efficient use of current water stocks including water conservation.

Competition is not an end in itself – it is merely a means to the end of increasing consumer welfare. For some activities, which are generally characterised as natural monopolies,[105] it is not appropriate or possible to introduce competition. When competition is not feasible, or is not considered worthwhile, then effective regulatory and institutional arrangements for protecting the interests of customers and promoting efficiency need to be established. Experience in other network industries indicates that competition is a matter of degree, varying in extent from industry to industry.

The estimated benefits from introducing competition should be compared to the costs of its implementation. These implementation costs fall into two categories – the costs of transition to the new arrangements and the increase in transaction costs associated with an increased number of

105 Natural monopolies occur when the market is served most cheaply by a single firm rather than a number of competing firms and are characterised by economies of scale, which means that unit costs decline throughout the relevant range of production as output increases. They can also be characterised by economies of scope, which means that it is cheaper for one firm to provide two or more related products and services together, than for each of them to be provided by a separate firm. Economies of scope typically arise from the use of common assets to produce separate products (eg, cable television networks delivering both broadcast entertainment services and telecommunications services, utilising much of the same infrastructure). Significant sunk costs are also a feature of natural monopolies. These costs cannot be recovered if an entrant leaves the market. They also act as a barrier to entry.

market participants. The term 'transaction cost' refers to the cost of providing for some good or service through a market (ie, a number of firms offering the good or service) rather than having it provided by one firm. (In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to conduct negotiations leading up to a bargain, to draw up the contract and to undertake the inspection needed to make sure that the terms of the contract are being observed.)

If a decision is taken to introduce greater competition for certain functions involved in water service delivery, the most important requirement would be to establish an environment where competition can take place. It is difficult to predict the extent to which competition may develop and the extent of efficiency benefits that will arise. The emphasis should be on creating a transparent and predictable environment, which separates the potentially competitive components of the industry.

The starting point for determining the potential for extending competition to different components of the water and wastewater system is to analyse the functional elements of the entire water supply service to determine which are competitive and which are natural monopolies. Box B.2 provides a preliminary discussion of the competitive and monopoly elements of Sydney's water and wastewater service.

Box B.2 Identifying the competitive and monopoly functional elements of Sydney's water and wastewater service

Water services

Water storage and harvesting

The creation of the Catchment Authority in 1998 separated water storage and harvesting from the means of transporting and distributing it. There is potential for some competition within this element. A single buyer could secure supply from the Catchment Authority, and possibly also obtain bulk water from other sources via desalination, groundwater or recycling - depending on the viability of these alternative sources.

Water treatment

Water treatment could be natural monopoly in a small market that is at a distance from other markets, but is likely to be competitive as the size and density of the market increases.

Water transportation

Water transportation (which involves two separate roles - water transport and system operation) appears to be characterised by natural monopoly. Given the economies of scale and scope associated with infrastructure networks, it is generally cheaper for water to be transported by a single transmission and distribution system rather than by two or more competing alternatives. This is also true in other utility industries (eg, energy and rail); however, unlike these other industries the costs (and prices) associated with the transport component of water and sewerage services in Sydney have not been disclosed separately from the retail component (the commodity component is the price paid by Sydney Water to the Catchment Authority).

Retail services

The retail component involves two roles – planning and risk management associated with procuring supply of the service, and all aspects of the customer interface (metering, billing and customer service). Sydney Water currently provides retailing services for all customers in the greater Sydney metropolitan area, and these are priced and sold to customers as a bundled service with the transport and bulk water components. It is possible that the emergence of multi-utility retailers providing energy and telecommunications retail services will lead to interest from potential new entrants wanting to offer retail water services.

Sewerage services

Sewage transportation

Like the water distribution network, the piped sewerage network exhibits natural monopoly characteristics.

Retail services

The arrangements for sewerage service retailing are similar to those for water services, with the additional function of effluent testing and strength measurement (particularly for the trade waste sector). Again, in common with water, the financial unbundling of the transport and treatment components from the retail component is fundamental to the development of competition. Introducing competition in retail services also has associated costs, requires the introduction of supplier-of-last-resort arrangements and increases transactions costs in the industry.

Wastewater treatment and disposal

For sewage treatment and disposal, there may be potential for the emergence of effective competition in treatment facilities (e.g., small scale, on-site treatment plants for industrial users). Alternatively, it may be desirable for Sydney Water to offer an unbundled, tariff-based service to all potential treatment plant users.

Under third-party access, a new entrant shares access to those facilities in the supply chain exhibiting natural monopoly characteristics, while competing in the areas that are potentially competitive. The notion of third-party access underpins the reforms observed in electricity and gas industries in many jurisdictions (including Australia, the UK and North America). In general, third-party access has been introduced to enable large customers to choose their supplier, with arrangements often being extended to smaller customers once they have been found to be working effectively.

Progressive unbundling of the activities of an incumbent, vertically integrated service provider has been a feature of many industry reforms. That is, to maximise the benefits associated with competition, recent reforms to energy, transport and other utility industries in jurisdictions around the world have separated potentially competitive sectors from natural monopoly elements. The extent of unbundling has ranged from accounting separation through to full legal separation or divestment.

APPENDIX C TYPES OF OPEN ACCESS

Arrangements for infrastructure access depend on the industry context and, in particular, the benefits sought from or rationale for access (the overriding objective).

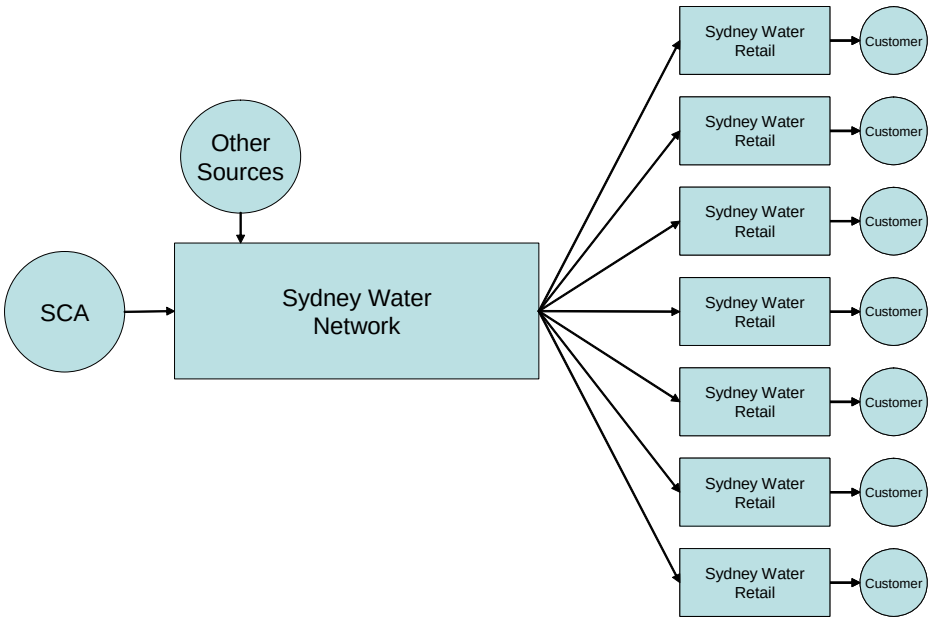
Objectives vary and include the following:

- Improve the efficiency of competitive retail elements - improve retail service / put competitive pressure on retail costs
- improve economic efficiency of monopoly parts of the industry (incentive regulation, comparison/yardstick approaches)
- enhance competition for supply and thereby enhance efficiency including supply source innovation.

In the case of water and wastewater services to the greater Sydney metropolitan area, the most pressing objective is to facilitate competition for supply, and encourage efficient and innovative development of new water sources (including better use of all resources in the water cycle). Given this objective, the Tribunal's analysis has concentrated on scenarios where access may be sought or provided to facilitate efficient use and development of water resources, rather than scenarios where access is provided to facilitate retail competition and choice.

The current integrated supply configuration is presented in Figure C.1 below (for simplicity, initially considering only potable water supply). 'Other Sources' conceptually includes demand management activities.

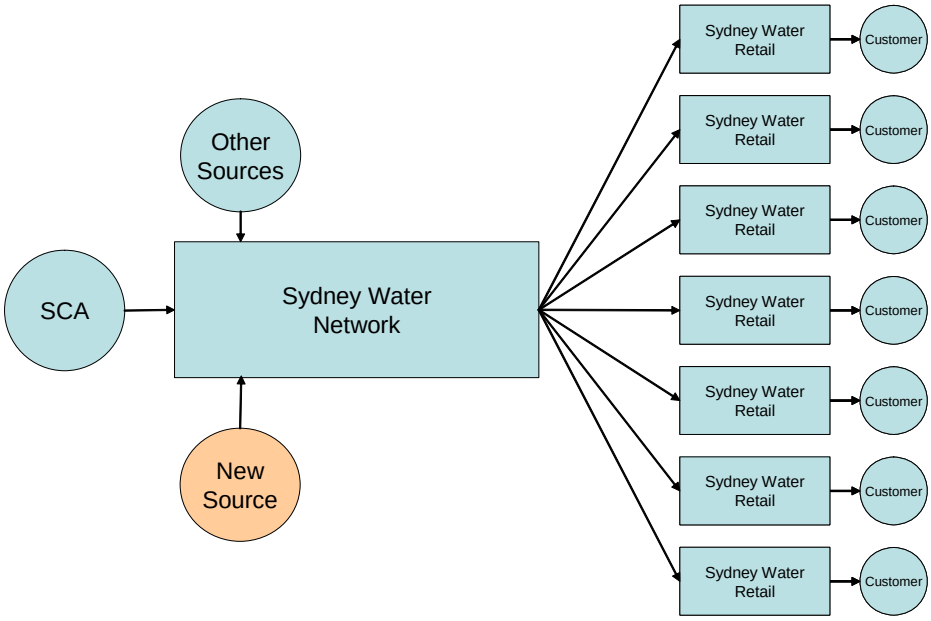
Figure C.1 - Current Supply Configuration



The first type of access configuration occurs when new entrants / third-parties develop new supply sources (Figure C.2 below) and require access at a connection point to realise the value of the resource. If the new water resource is purchased by Sydney Water, this is really just a case of competitive supply. There is no relationship between the new 'bulk' water

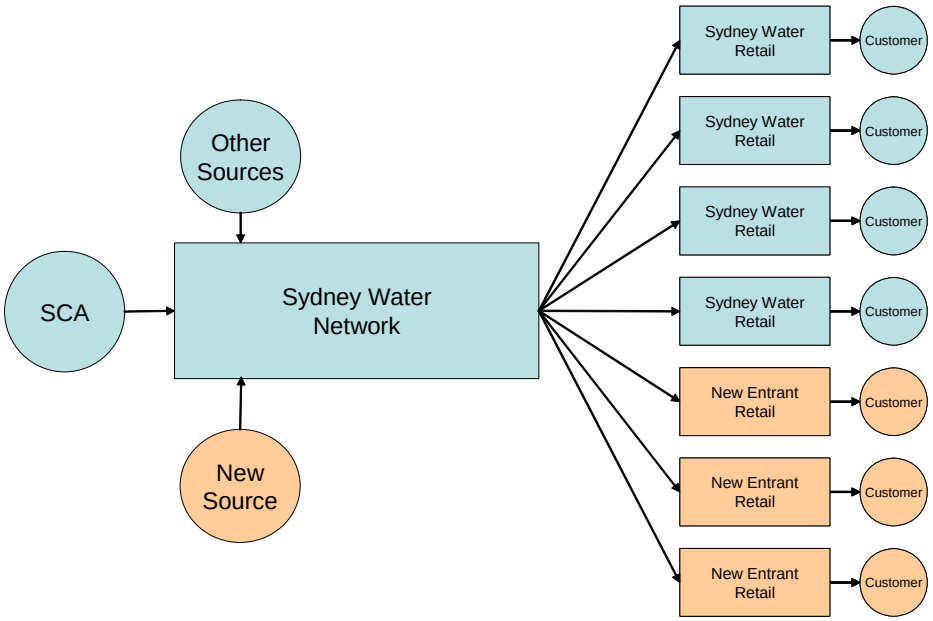
supplier and consumers. Instead, the bulk water price – at the connection point - is negotiated/agreed with Sydney Water. (Note that the cost of connection is effectively an input cost to the new supplier. As such, this cost would be taken into account in the new entrant's bulk water price).

Figure C.2 - Third-Party Supplier of Bulk Water to Sydney Water



A new entrant might inject water into one part of Sydney Water's system and off-take water at another point for the purpose of supplying one or more customers. In this case, the new entrant uses Sydney Water's network to transport[106] water from one point to another (Figure C.3). Under this scenario, an infrastructure access charge is required. This is the access configuration that the Tribunal proposes to facilitate under its recommended 'negotiate and arbitrate' access regime.

Figure C.3 - Third-Party Access for Transport Services



Other services may be required, such as:

- balancing ('top-up and spill')
- back-up.

A balancing arrangement is likely to be required where volumes injected do not match volumes withdrawn from the system, or it is inefficient to require a new entrant to balance their own supply and demand. A back-up supply may be required if the new injection is less reliable than the customer requires. These additional services have not been modelled by the Tribunal but are likely to be important.

The analogous infrastructure access for wastewater is illustrated below. Figure C.4 shows a simplified model of Sydney Water's current wastewater service. Customers 'inject' wastewater into the system, and it is transported through Sydney Water's wastewater network to sewage treatment plants for treatment and disposal. The 'Sydney Water Retail' boxes highlight that Sydney Water operates the customer interface – billing customers for wastewater disposal, etc.

106 Third-party access to the water system need not be limited to transport. For example, a new entrant could inject raw water into the system and 'toll' it through Sydney Water's water treatment facilities.

Figure C.4 – Simplified Model of Sydney Water's Wastewater System

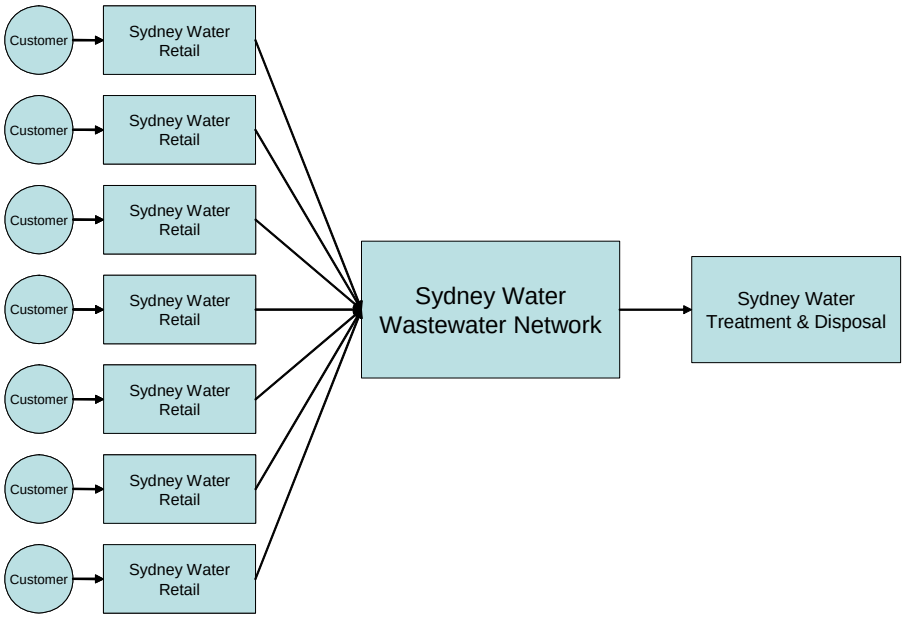
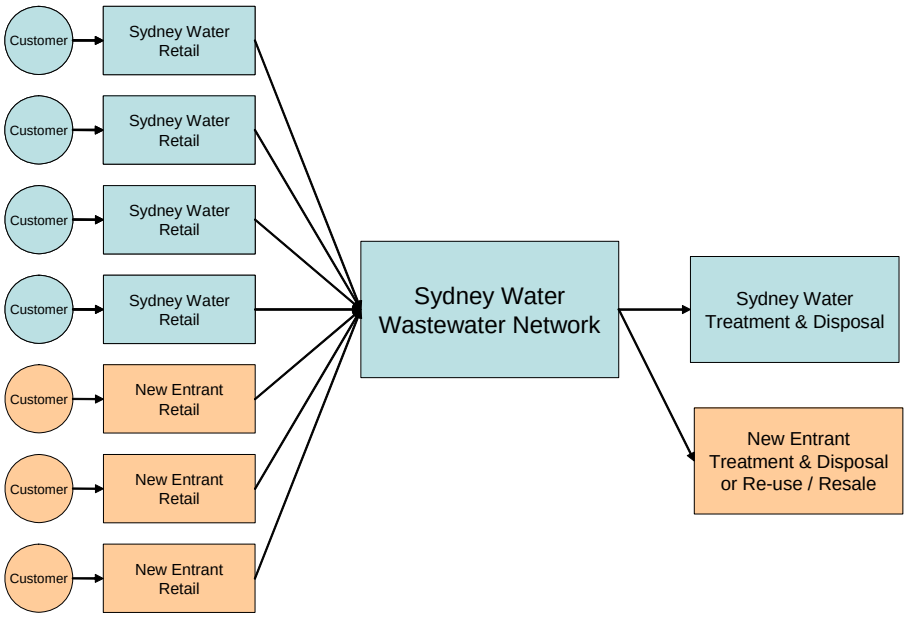


Figure C.5 illustrates a possible access scenario, where a new entrant undertakes treatment and disposal (or 'transformation' in the case of re-use) of wastewater. The new entrant would contract with customers to 'purchase' their wastewater. The new entrant would pay an infrastructure access charge to Sydney Water for using existing sewers to transport the customers' wastewater to the new entrant's wastewater treatment plant.

Figure C.5 – Transport through Sydney Water's Wastewater System



APPENDIX D ACCESS PRICING SCENARIOS

These scenarios use the prices set out in the Tribunal's recent determination for metropolitan water prices.[107] For water supply, the average retail tariff over the price determination period (1 October 2005 to 30 June 2008) is $1.51/kL for residential customers and $1.25/kL for non-residential customers (fixed charge plus usage charge). The average retail tariff for wastewater services over the period is $1.64/kL. In addition, the scenarios assume an LRMC of water supply in greater Sydney of $1.20/kL. As set out in the Tribunal's determination of metropolitan water prices,[108] this is the lower bound of the current estimated range for the LRMC of water supply of $1.20 to $1.50 per kL, based on the Government's Metropolitan Water Plan. All other figures in the scenarios have been assumed by the Tribunal. In addition, all figures are expressed on a per annum basis and the scenarios calculate an average annualised access charge (per kL) for the determination period.

Please note that the purpose of the scenarios is to illustrate the workings of the different access pricing methodologies and in particular the implications for the cash flows of new entrants – they cannot be taken to be show indicative access prices.

Scenario 1 – Access to wastewater system in an ocean outfall catchment area

Description

A new entrant company:

- collects wastewater at the residential property level across the Sydney metropolitan area and injects into to Sydney Water system, and
- withdraws wastewater at a large coastal sewerage treatment plant (STP).

The volume of wastewater to be transported through the system is assumed to be 10 GL pa, or 3% of the wastewater treated by coastal STPs.

Efficient Component Pricing Rule ($2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
Sydney Water retail charge	$16,390,000	$381	$1.64
less avoided treatment costs	-$230,000	-$5	-$0.02
less avoided disposal costs	-$100,000	-$2	-$0.01
plus incremental cost of access	$100,000	$2	$0.01
Access Charge	$16,160,000	$376	$1.62

Major assumptions:

- Avoided treatment costs of about $25/ML, based on reduced energy and biosolid treatment and disposal costs.

107 IPART, *Sydney Water Corporation, Hunter Water Corporation, Sydney Catchment Authority – Prices of Water Supply, Wastewater and Stormwater Services – Final Report*, September 2005.

108 Op cit, p 18.

- Avoided disposal costs of about $10/ML, based on reduced screenings and DEC licence costs.
- Incremental cost of regulation assumes total additional cost to Sydney Water of providing access is $1m p.a. (order of magnitude estimate only). This would be shared over customers seeking access in some way. This scenario is allocated 10 per cent of the total.

Building Block ($2005/06)

Building Block Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$7,150,000	$166	$0.72
Depreciation	$1,630,000	$38	$0.16
Operating Cost Allocation	$3,190,000	$74	$0.32
Access Charge	$11,970,000	$278	$1.20

Major assumptions:

- Total Sydney Water capital costs and reticulation (operating) cost are allocated to the different catchment areas on the basis of km of pipe used to transport wastewater. Overhead (operating) costs are allocated per property.
- Approximately 3 per cent of Sydney Water's wastewater assets in coastal catchments utilised by new entrant.

The table below illustrates the new entrant's cash flows under the ECPR and building block approaches respectively. The new entrant would bill end-use customers for wastewater services, and pay Sydney Water an access charge. The surplus retained by the new entrant would be used to cover the costs of service delivery (ie billing and collection, treatment and disposal or re-sale).

Scenario 1: New entrant cash flows - access to wastewater system in an ocean outfall catchment area

	ECPR	Building Block	
Wastewater charge	$1.64/kL	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.62/kL	$1.20/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.02/kL	$0.44/kL	Retained by new entrant

The table illustrates that, under ECPR, a new entrant would receive only a small surplus (equal to Sydney Water's avoided costs of 2c/kL) after paying for infrastructure access. In other words, a new entrant wanting to treat and re-sell wastewater should not expect to obtain significant revenue from disposal of customers' waste – its business case would rely

on selling recycled water for more than its processing cost. Under the building block approach, the new entrant would receive 44c/kL of wastewater taken out of Sydney Water's system.

Long Run Marginal Cost ($2005/06)

LRMC Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
LRMC of Capacity	$0	$0	$0.00
Avoidable Operating Cost	$0	$0	$0.00
Incremental cost of access	$100,000	$2	$0.01
Access Charge	$100,000	$2	$0.01

Major assumptions:

- No avoidable operating cost or capacity-related investment included in the LRMC.

Scenario 2 –Access to wastewater system in an inland STP catchment area

Description

A new entrant company:

- collects wastewater at the residential property level across the Sydney metropolitan area and injects into to Sydney Water system, and
- takes wastewater out at an inland STP.

The volume of wastewater to be transported through the system is assumed to be 10 GL pa, or 15 per cent of the wastewater treated by inland STPs

The ECPR infrastructure access price is calculated for two scenarios:

- where the methodology assumes that 80 per cent of the capital expenditure is funded by capital contributions; and
- where the methodology considers the entire cost of avoided investment.

Efficient Component Pricing Rule (with capital contributions $2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
with capital contributions			
Sydney Water retail charge	$16,390,000	$381	$1.64
less avoided treatment costs	-$1,590,000	-$37	-$0.16
less avoided disposal costs	-$410,000	-$10	-$0.04
less avoided capital costs	-$690,000	-$16	-$0.07
plus incremental cost of access	$100,000	$2	$0.01
Access Charge	$13,800,000	$320	$1.38

Major assumptions:

- Avoided treatment cost estimated to be $160/ML (significantly higher than for coastal treatment plants in Scenario 1).[109]
- Avoided disposal cost estimated to be $41/ML.
- Capital expenditure (net of capital contributions) of $14 million on STP capacity expansion is delayed for five years.[110] This leads to avoided depreciation and return on investment over the current period.
- Incremental cost of access is 10 per cent of the notional $1m total cost to Sydney Water.

Efficient Component Pricing Rule (no capital contributions $2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
no capital contributions			
Sydney Water retail charge	$16,390,000	$381	$1.64
less avoided treatment costs	-$1,590,000	-$37	-$0.16
less avoided disposal costs	-$410,000	-$10	-$0.04
less avoided capital costs	-$3,430,000	-$80	-$0.34
plus incremental cost of access	$100,000	$2	$0.01
Access Charge	$11,060,000	$256	$1.11

Major assumptions:

- As above except that delayed ('avoided') capital expenditure amounts to $65 million.

Building Block ($2005/06)

Building Block Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$8,090,000	$188	$0.81
Depreciation	$1,850,000	$43	$0.19
Operating Cost Allocation	$3,530,000	$82	$0.35
Access Charge	$13,470,000	$313	$1.35

Major assumptions:

- Approximately 20 per cent of Sydney Water's wastewater assets in inland STP catchment areas are utilised.

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109 Avoided treatment and disposal costs are very rough estimates only, as no accurate information was available.

110 It is assumed that 80 per cent of the total expenditure of $65 million will be funded by capital contributions.

- Inland STP catchment areas are assumed to require 15% more metres of pipe per property than coastal catchments due to lower population density.

The ECPR access price is greater than the Building Block access price when $13 million of capital expenditure is avoided, but less than the Building Block access price when $65 million of capital expenditure is avoided. The new entrant's cash flows under the ECPR and Building Block approaches are as follows:

Scenario 2: New entrant cash flows - access to wastewater system in a tertiary treatment plant catchment area

	ECPR ($14m avoided capex)	ECPR ($65m avoided capex)	Building Block	
Wastewater charge	$1.64/kL	$1.64/kL	$1.64/kL	Customer pays new entrant
less Infrastructure Access Charge	$1.38/kL	$1.11/kL	$1.35/kL	New entrant pays Sydney Water
Surplus before billing and collection costs, treatment, disposal and/or re-sale	$0.26/kL	$0.53/kL	$0.29/kL	Retained by new entrant

One of the features of an ECPR access price is that it can vary from period to period. For example, the avoided capital costs included in the calculation exist only for the period during which capital expenditure is avoided. If the delayed capital expenditure were undertaken in the next access period, the ECPR access price would rise.

Long Run Marginal Cost ($2005/06)

LRMC Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
LRMC of Capacity	$0	$0	$0.00
Avoidable Operating Cost	$0	$0	$0.00
Incremental cost of access	$100,000	$2	$0.01
Access Charge	$100,000	$2	$0.01

Major assumptions:

- No avoidable operating cost or capacity-related investment included in the LRMC.

Scenario 3 – Large desalination plant producing potable water for supply to non-residential customers

Description

A new entrant company:

- inputs potable water (ie no further treatment required) from desalination plant (or similar) into Sydney Water water system at a single point; and

- withdraws potable water at (say) 3 industrial sites – that is, supplies 3 large customers only.

The volume of water to be transported through the water system is assumed to be 20ML/day or 7.3GL per annum. The access price will primarily relate to the large trunk mains (rather than distribution mains).

Efficient Component Pricing Rule ($2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
Sydney Water retail charge	$9,120,000	$3,040,000	$1.25
less avoided cost of water purchases	-$8,760,000	-$2,920,000	-$1.20
less avoided treatment costs	-$350,000	-$117,000	-$0.05
less avoided transport costs	-$100,000	-$33,000	-$0.01
less avoided retail costs	-$15,000	-$5,000	$0.00
plus incremental cost of access	$130,000	$43,000	$0.02
Access Charge	$25,000	$8,000	$0.01

Major assumptions:

- Avoided cost of water purchases are based on LRMC of water supply of $1.20/kL
- Avoided treatment costs are assumed to be $48/ML and transport costs are $14/ML.
- Avoided retail costs are based on $5,000 per customer p.a. account management activity
- Incremental cost of access is again share of a notional $1m total cost to Sydney Water.

The ECPR outcomes are very sensitive to the assessed LRMC of water supply. The average tariff for non-residential customers is $1.25/kL. Setting the LRMC of water supply to $1.20 (the bottom of the estimated range given by the Government's Metropolitan Water plan) results in a very low access charge (1c/kL) while a LRMC of more than $1.21/kL would result in a negative access charge.

Building Block ($2005/06)

Two scenarios for the location of the industrial customers are considered:

- Customers close to the potable supply point.
- Customers distant from the supply point.

Building Block Access Charge (Customers close to desalination plant)	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$480,000	$160,000	$0.07
Depreciation	$110,000	$37,000	$0.02
Operating Cost Allocation	$450,000	$150,000	$0.06
Access Charge	$1,040,000	$347,000	$0.15

Major assumptions:

- Cost allocation based on using only large pipes close to desalination plant. A volume-based share of 3 per cent of total supply area network by length has been allocated.

Building Block Access Charge (Customers remote from desalination plant)	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$1,450,000	$483,000	$0.20
Depreciation	$320,000	$107,000	$0.04
Operating Cost Allocation	$1,350,000	$450,000	$0.18
Access Charge	$3,120,000	$1,040,000	$0.42

Major assumptions:

- Cost allocation based on using large pipes throughout local network. A volume-based share of 8 per cent of total supply area network by length has been allocated.

If specifically calculated building block based access charges are used, the access charge could vary greatly. However, opportunities for cherry-picking[111] are low because building block based access charges are greater than the ECPR charges, indicating that efficient new entrants are unlikely to be profitable under building block access charges even for 'close' customers, as illustrated in the following table:

Scenario 3: New entrant cash flows – Large desalination plant producing potable water for supply to non-residential customers

	ECPR	Building Block (nearby customers)	Building Block (distant customers)	
Water supply charge	$1.25/kL	$1.25/kL	$1.25/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.01/kL	$0.15/kL	$0.42/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$1.24/kL	$1.10/kL	$0.83/kL	Retained by new entrant

Adopting a building block based access charge will exclude efficient new entrants unless they can somehow deliver water for less than the minimum estimated LRMC of water supply of $1.20/kL. Under Scenario 3, a new entrant would need to deliver water for no more than $1.10/kL for nearby customers, and $0.83/kL for distant customers.

111 Introducing differential access prices in the presence of uniform retail prices may create incentives for new entrants to 'cherry-pick' those customers that are cheapest to serve.

Long Run Marginal Cost

LRMC Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
LRMC of Capacity	$0	$0	$0.00
Avoidable Operating Cost	$0	$0	$0.00
Incremental cost of access	$130,000	$43,000	$0.02
Access Charge	$130,000	$43,000	$0.02

Major assumptions:

- No avoidable operating cost or capacity-related investment included in the LRMC.

Scenario 4 – Large desalination plant producing potable water for supply to residential customers

Description

A new entrant company:

- inputs potable water (ie, no further treatment required) from desalination plant (or similar) into Sydney Water's water system single point
- takes out potable water for supply to residential customers

This is a variation on Scenario 3. It is designed to illustrate the difference between a total "transmission and distribution" water system access price and a transmission "trunk main" only access price. The volume of water to be transported through water system is assumed to be 20ML/day or 7.3GL per annum (as per Scenario 3). The residential customers are assumed to be uniformly spread across metropolitan Sydney.

Efficient Component Pricing Rule ($2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
Sydney Water retail charge	$11,000,000	$377	$1.51
less avoided cost of water purchases	-$8,760,000	-$300	-$1.20
less avoided treatment costs	-$350,000	-$12	-$0.05
less avoided transport costs	-$100,000	-$3	-$0.01
less avoided retail costs	-$150,000	-$5	-$0.02
plus incremental cost of access	$130,000	$4	$0.02
Access Charge	$1,770,000	$61	$0.25

Major assumptions are as per Scenario 3 except:

- Avoided retail costs based of $5 per customer p.a. meter reading activity.

Building Block ($2005/06)

Building Block Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$1,930,000	$66	$0.26
Depreciation	$430,000	$15	$0.06
Operating Cost Allocation	$1,810,000	$62	$0.25
Access Charge	$4,170,000	$143	$0.57

Major assumptions:

- Approximately 10% (volume weighted share) of the supply area network is allocated.

From a new entrant's point of view, the ECPR and building block methods result in the following cash flows:

Scenario 4: New entrant cash flows – Large desalination plant producing potable water for supply to residential customers

	ECPR	Building Block	
Water supply charge	$1.51/kL	$1.51/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.25/kL	$0.57/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$1.26/kL	$0.94/kL	Retained by new entrant

Adopting a building block based access charge will exclude efficient new entrants unless they can deliver water for less than $0.94/kL, which is 26c/kL below the minimum estimated LRMC of water supply $1.20/kL.

Long Run Marginal Cost ($2005/06)

LRMC Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
LRMC of Capacity	$0	$0	$0.00
Avoidable Operating Cost	$0	$0	$0.00
Incremental cost of access	$130,000	$4	$0.02
Access Charge	$130,000	$4	$0.02

Major assumptions:

- No avoidable operating cost or capacity-related investment included in the LRMC.

Scenario 5 – Small potable water plant for supply to a suburb of residential customers

Description

A new entrant company:

- inputs potable water from stormwater recovery, aquifer storage recharge or equivalent (ie no further treatment required) into Sydney Water water system single point
- takes out potable water for supply to residential customers in defined suburb (say 4,000 customers).

The volume of water to be transported through water system is assumed to be 1 GL per annum. The injection point/potable water supply is assumed to be in the suburb – that is close to the customers. The access price to be calculated will be a water system access price on a per customer and volume basis. The price will relate primarily to access to the distribution mains only.

Efficient Component Pricing Rule ($2005/06)

Efficient Component Pricing Rule	Total Revenue or Cost	Cost per Customer	Cost per kL
Sydney Water retail charge	$1,510,000	$378	$1.51
less avoided cost of water purchases	-$1,200,000	-$300	-$1.20
less avoided treatment costs	-$50,000	-$13	-$0.05
less avoided transport costs	-$10,000	-$3	-$0.01
less avoided retail costs	-$20,000	-$5	-$0.02
plus incremental cost of access	$20,000	$5	$0.02
Access Charge	$250,000	$62	$0.25

Major assumptions are as per Scenario 4.

The ECPR price is identical to Scenario 4. This highlights the fact that this methodology for calculating network access charge is independent of the characteristics of the network used to supply the customer.

Building Block ($2005/06)

Building Block Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
Return on Investment	$230,000	$58	$0.23
Depreciation	$50,000	$13	$0.05
Operating Cost Allocation	$210,000	$53	$0.21
Access Charge	$490,000	$124	$0.49

Major assumptions are as per Scenario 4 except:

- Customers in this scenario are allocated slightly less pipe (because they are assumed to use only small local pipes).

From a new entrant's point of view, the ECPR and Building Block methods result in the following cash flows:

Scenario 5: New entrant cash flows – Small potable water plant for supply to a suburb of residential customers

	ECPR	Building Block	
Water supply charge	$1.51/kL	$1.51/kL	Customer pays new entrant
less Infrastructure Access Charge	$0.25/kL	$0.49/kL	New entrant pays Sydney Water
Surplus before customer service, water and treatment costs	$1.26/kL	$1.02/kL	Retained by new entrant

Adopting a building block based access charge will exclude efficient new entrants unless they can somehow deliver water for less than $1.02/kL, which is 18c/kL below the minimum estimated LRMC of water supply of $1.20.

Long Run Marginal Cost ($2005/06)

LRMC Access Charge	Total Revenue or Cost	Cost per Customer	Cost per kL
LRMC of Capacity	$0	$0	$0.00
Avoidable Operating Cost	$0	$0	$0.00
Incremental cost of access	$20,000	$5	$0.02
Access Charge	$20,000	$5	$0.02

Major assumptions:

- No avoidable operating cost or capacity-related investment included in the LRMC.

APPENDIX E SUMMARY OF ACCESS PRICING METHODOLOGIES

The following table compares the access price approaches under possible evaluation criteria.

	ECPR	**LRMC of Network Assets plus costs of providing access (no contribution to shared costs)**	**Building Block**
Retail Pricing Outcomes	Facilitates retention of any current cross subsidies, current sunk cost, margin and risk allocation, cost recovery equity decisions, etc. If avoided cost calculation is accurate then there are no implications for retail pricing of customers retained by incumbent. ECPR has been criticised because it also allows incumbents to retain monopoly rents. However, this is not a significant problem in Sydney's water industry where the Tribunal also regulates retail tariffs.	To avoid cherry-picking and maintain geographically uniform prices, a single (geographic average) LRMC would be required. See also Financial Outcomes below.	To avoid cherry-picking and maintain geographically uniform prices, a single (geographic average) access charge would be required. See also Financial Outcomes below.
Sydney Water Financial Outcomes	If avoided cost calculation is accurate then no implications for incumbent business.	New entrants (and their customers) make no contribution to sunk costs. Therefore, general situation is that either the incumbent's remaining customers must pay more or the value of the Government's investment in sunk assets is destroyed. However, for Sydney Water LRMC access price is often greater than ECPR access price – so limited value implications.	Network costs are recovered. However retail operating cost per customer will increase with loss of customers. Therefore either the incumbent's remaining customers must pay more or the value of the Government's investment in sunk assets is destroyed. For envisaged regime where access is limited to very large customers, the change in incumbent retail operating cost per customer will be minimal.

	ECPR	LRMC of Network Assets plus costs of providing access (no contribution to shared costs)	Building Block
Third Party Entry Outcomes	Theoretically ECPR results in efficient entry. Entry will only occur when third party costs are lower than avoided costs of incumbent. However, initial modeling shows that a 'pure' ECPR basis yields negative access charges/components. If negative charges are not allowed, then some efficient potential new entrants would be excluded.	LRMC is not necessarily lower than the ECPR in Sydney. Therefore at current retail price levels, LRMC may exclude efficient potential new entrants.	Modeling shows that this option is unlikely to give enough headroom between access and retail prices to allow efficient access in water supply. May be a viable option for wastewater.
Locational Pricing Issues	Because retail prices are geographically uniform, ECPR will yield geographically uniform access prices in most circumstances.	For off-takes: To avoid cherry-picking and maintain geographically uniform prices, a single (geographic average) LRMC would be required. Concept of geographically averaged LRMC not necessarily economically meaningful. For injections: LRMC-based access charge would vary geographically. This is considered to be an advantage of the methodology - project proponents see efficient locational pricing signals.	Methodology may be implemented to provide anything from geographically averaged ('postage stamp') to customer specific access prices. One problem with a building block approach and case-by-case calculation of costs in a pipeline system is that access prices will tend to be proportional to the distance between injection and withdrawal. That means that proponents of new sources will have an economically inefficient incentive to find local users for their water. Gas concept of back-haul may be useful but that places severe pressure on geographic uniform prices.

	ECPR	LRMC of Network Assets plus costs of providing access (no contribution to shared costs)	Building Block
Administrative Feasibility	Some inputs may involve complex calculations. However, methodology achieves efficient outcome on a case-by-case basis. Costs unlikely to be prohibitive for initial small-scale access. However, initial modeling shows that a 'pure' ECPR basis yields negative access charges/components. If negative components were not allowed, some modification to ECPR (or retail price rises) would be required for implementation.	Not particularly complex but no regulatory consensus on calculation methodology. Parties can dispute methodology adopted and dispute inputs.	Well understood methodology. However allocation assumptions subject to wide discretion and may be disputed in a 'negotiate and arbitrate' framework.
Market Confidence	Supported by Sydney Water.Not supported by Services Sydney. UK water industry precedent. Too early to tell whether the methodology is successful at promoting access. NZ telecommunications precedent including Privy Council finding that it was the method most likely to facilitate entry to a vertical monopoly. However lack of success of ECPR negotiated access framework has led to further regulatory reform.	Australian electricity industry (embedded generation) precedent for LRMC-based access charges for new water sources.	Methodologies well understood from electricity and gas industry access regimes. Large body of regulatory experience and precedent for setting DORC-based access prices.

	ECPR	LRMC of Network Assets plus costs of providing access (no contribution to shared costs)	Building Block
Stability of Access Prices	LRMC of water source is potentially volatile over time. Replicates dynamic market outcomes – with associated complexity.	LRMC of network is probably quite stable except where specific areas of network congestion drive augmentation.	Very stable. Average cost changes slowly.

APPENDIX F STUDIES REVIEWED ON ECONOMIES AND DISECONOMIES OF SCALE

Study	Results
Tynan & Kingdom (2005), "Optimal Size for Utilities?" *Public Policy for the Private Sector*, Note Number 283, The World Bank Group. Using data from 270 water and sanitation providers in Africa, Indonesia, Peru, the United States and Vietnam, this study uses a 'standard econometric model' to estimate economies of scale.	• While results are mixed, this paper shows that utilities serving a population of 125,000 or less could reduce per customer operating costs by increasing their scale of operation. • In some cases, diseconomies of scale can occur when a large utility (serving more than 125,000) doubles in size. In other case, such an increase in scale does not result in diseconomies.
Stone and Webster (2004), "Investigation into evidence for economies of scale in the water and sewerage industry in England and Wales", for the Office of Water Services (Ofwat). This study employs econometric methodologies to estimate models of industry costs, for both water and sewerage companies (WaSCs) and water only companies (WoCs), over the period 1992/93 to 2002/03.	• There is evidence of diseconomies of scale for the average-sized WaSCs (about 2 million water supply connections and 2.3 million sewerage connections in 2002/03), but these diseconomies are declining over the sample period. Early in the sample period, a 1% increase in scale is associated with a 1.7% increase in long-run costs, while by 2002/03 the same increase in cost is estimated to increase costs by 1.5%. This change reflects improved efficiency in capital investment offsetting rising diseconomies of scale in operating expenditure. • The models show small economies of scale for the averaged sized WoC (about 350,000 water supply connections). However, the presence of constant returns to scale cannot be rejected, and it would therefore be inappropriate to assume that the average sized WoC is characterised by economies of scale. • Stone and Webster (2004, p.5) also note, separate to their modelling, that "Ofwat's water service opex efficiency rankings tend to show deterioration in relative efficiency above around 2.5 million connected properties".
Strategic Management Consultants (2002), *Optimal entity size in the water industry of England and Wales: a review of factors which influence the size of companies*, unpublished report to Ofwat. (Sourced from Stone & Webster, 2004)	According to Stone and Webster (2004, p.24), "The principal conclusion in this report is that technical economies of scale are exhausted at about 400,000 connected properties."
Indepen and Accenture (2002), "Water merger policy: time for review", sponsored by Severn Trent, South East Water, Swan Group and United Utilities water	• Based on a 'bottom up' assessment (i.e. looking at the potential for economies of scale in each component of a water utility – including treatment and abstraction, distribution, corporate and customers services and procurement),

Study	Results
companies, www.indepen.co.uk. Stone and Webster (2004, p.24), argue that "The findings of this study drew largely upon similar work in the electricity sector and did not derive from a robustly estimated model of water service costs."	Indepen estimate the total amount that could be saved from mergers of water companies in England and Wales, as a result of economies of scale, ranges from 5% to 11% of target company costs. It is expected that these cost savings would primarily be achieved via economies of scale in corporate and customer services. • The degree to which these figures vary between actual combinations will depend on a number of factors including the organisation, systems, processes, geographic location and the extent to which the management is capable of achieving the savings. • Actual savings (between 5% and 11%) depends on the size of the companies involved – larger companies will generally achieve larger savings in absolute terms. However, the percentage of the target company's costs that is saved increases with the relative size difference between the two companies. • According to Indepen and Accenture (2002), "A point exists at which diseconomies of scale could affect the performance of water companies. But, given the capabilities of modern technology and management, combined with the scale at which other industries successfully operate, we would argue that the majority of UK water companies are a significant distance from reaching that point. If companies do already find themselves at this point, it may be because they have not adjusted their businesses to the capabilities available in the modern business world. A merger may provide the opportunity and stimulus for them to do so."
Ashton (2003), "Capital Utilisation and Scale in the English and Welsh Water Industry", *The Services Industry Journal*, 23(5), p.137-149. This study estimates a variable cost model of the UK water industry. From this variable cost function, estimates of economies of scale and economies of capital utilisation and capacity utilisation are made (for the period 1991-1996). The data used in the study consist of 20 English and Welsh water companies (average	The results indicate that "slight, albeit significant diseconomies of scale and substantial diseconomies of capital utilisation exist in the industry."

Study	Results
population serviced of 660,000 and average length of water mains 3,726km).	
Saal and Parker (2001), "Productivity and Price Performance in the Privatised Water and Sewerage Companies of England and Wales", *Journal of Regulatory Economics*, 20, 61-90. Total costs for the 1985-99 period are estimated using a cost function model with quality adjusted sewerage and water service outputs, and labour, capital and other materials as inputs.	The study finds substantial diseconomies of scale for the mean water and sewerage company (WaSC) in England and Wales, with a scale elasticity estimate for the mean WaSC ranging from 0.83-0.88 in several alternative specifications (<1 measuring diseconomies).
Mizutani & Urakami (2001), "Identifying network density and scale economies for Japanese water supply organizations", *Papers in Regional Science* 80, p. 211-230. This study estimates cost functions, for the water industry in Japan, with three different cost models (log-linear, translog and translog with a hedonic function).	• There are economies of network density at the sample mean, however the magnitude of these economies is not large; • there are diseconomies of scale at the sample mean; • the optimal size (which is the size that attains minimum average cost) of a water supply agency is a size of 261,084 thousands m^3 and a network length of 1,221 km; and • for this output and network size, the optimal size of a water-supplied population is about 766,000.
World Bank (1997), "Toolkits for private participation in water and sanitation", http://www.worldbank.org/html/fpd/water/wstoolkits/Kit1/frame.html	This source merely states that "U.K. experience suggests that a service area of less than about 500,000 customers leads to suboptimal operation."