

Reforming Urban Water

A national pathway for change

December 2017



REFORM SERIES

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It leads reform on key issues including means of financing, delivering and operating infrastructure and how to better plan and utilise infrastructure networks.

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Executive Summary

Urban water is a critical resource that we cannot afford to take for granted

Australia's urban water sector provides an essential service to more than 20 million people and 9 million connected properties in our cities and towns. The sector has a strong track record of providing a range of high quality services to support our great way of life and to underpin economic activity.

Australians have rightly come to expect that their water will be clean, safe and available whenever they need it. For many, the only interaction we have with our water provider – beyond turning on taps and flushing toilets – is when we pay for services through our bills or council rates. Increasingly, we also expect our water services to meet a range of broader environmental outcomes in our growing towns and cities. Few give a second thought to the extensive, largely hidden water infrastructure systems required to deliver these services.

While some may take it for granted, urban water infrastructure is expensive to build and maintain, and faces a number of challenges over coming years. Much of the urban water infrastructure that has served us well in the past is ageing, or coming under increasing pressure from growing populations and a changing climate. Reform is required to ensure the sector can continue to provide safe, reliable and affordable services into the future.

Urban water should move from a sector where governments must balance roles as owner, regulator and policy-maker to a more sophisticated, well-regulated, responsive sector with stronger links between supply and demand, and clearer signals for efficient investment. This means re-shaping the urban water sector, including the range of institutions, regulatory frameworks and decision-making processes that govern them, to be more efficient, resilient, transparent and accountable.

Australia's governments and utilities have a distinct opportunity to plan and prepare for the challenges ahead in a way that will most effectively and efficiently meet the long-term needs of users. Delaying these actions means pressing concerns – such as a major drought or failing assets – could prevent clear thinking on effective, long-term solutions. Now is the time for reform.

This paper establishes a foundation and a pathway for reforming urban water. It:

1. provides the **case for reform** and the potential costs of inaction
2. establishes **national objectives** to guide reform and ensure the sector can meet future challenges
3. **benchmarks** each state and territory's urban water sector against minimum and best practice criteria
4. identifies a **pathway** with clear recommendations to guide reform efforts across the country.

We need to address mounting challenges in urban water

Our world is changing, bringing new challenges for Australia's infrastructure. A range of pressures are emerging that could challenge Australians' expectations for water supply and demand:

1. meeting the needs of a **growing population**
2. improving **resilience** and managing the impacts of climate change
3. maintaining, renewing and replacing **ageing infrastructure**
4. reflecting changing **community expectations**
5. **keeping services affordable** for customers and **minimising costs** to taxpayers.



Which types of water services does this paper cover?

This paper examines the urban water sector, which can be separated into two parts:

- **Metropolitan:** In larger urban areas, such as state and territory capitals, urban water services are typically provided by large utilities. The bulk of services in most cities are funded by user charges.
- **Regional urban:** In towns with smaller populations, urban water services are usually provided by local utilities, often run by the local council. These utilities may face a range of distinct challenges, including a lack of scale, remoteness or more extreme climatic conditions when compared to metropolitan areas. As a result, services in these areas are more likely to be at least partially funded by the broader tax base through community service obligations (CSOs).

Outside urban areas, the water sector encompasses a range of other services. These include rural water services, which involves the provision of predominantly non-potable water to customers outside of towns and cities. Rural water services include providing water for regional industries such as agriculture, where water is used to grow crops, and mining, where it is used for commodity extraction processes and dust suppression.

There is scope for further reform of the rural water sector, as indicated in the *Australian Infrastructure Plan*. However, these reform processes should be considered separately to those in urban water, which faces distinct challenges in providing water services to cities and towns. Rural water reforms should be guided by the range of government authorities charged with its oversight, regulation and review, including the Murray Darling Basin Authority, the Productivity Commission through its planned inquiry into the Basin Plan in 2018, and the Council of Australian Governments (COAG).

Our urban water sector must anticipate and respond to these challenges. Many of these were borne out over the period from 1996 to 2010, when much of southern Australia experienced severe drought conditions. The Millennium Drought exposed a number of vulnerabilities of the sector, and led to over \$11 billion of investment (in today's dollars) to augment supply through desalination plants. Many of the decisions to invest in desalination plants were a costly response to an immediate challenge – costs that continue to be met through increases in customers' bills or taxes.

The Millennium Drought illustrated the scale of challenges facing the urban water sector, and highlighted the need for sound long-term planning to ensure the urban water sector can continue to securely, flexibly and efficiently meet the needs of Australians into the future. Few issues are more important than how we secure our water supplies to meet the long-term needs of users, but this must be balanced with the need to keep water bills affordable.

However, providing safe and reliable drinking water for cities and towns is only one of the challenges facing urban water over coming decades. There are cost drivers across the water cycle, including wastewater treatment, environmental protection and stormwater management. Unless these challenges are effectively addressed, water customers could be exposed to service interruptions, a decline in water quality and availability, and rising bills. A combination of reforms is required to enable the water sector to manage emerging risks and support productivity growth through this period of change.

Unless we take action now, bills could rise substantially over coming years

Many challenges facing urban water are beyond the control of those in the sector, such as climate variability, or are the result of previous decisions, such as ageing infrastructure in our towns and cities. These factors could bring upward pressure on the costs of delivering urban water services in Australia. A snapshot of these factors is provided in **Figure A**.

In order to understand the potential impact on affordability of these cost drivers, Infrastructure Australia commissioned modelling to project how challenges facing urban water could affect household bills. This analysis is based on projections of future revenue requirements to manage future cost drivers. It indicates that, without appropriate action to address rising capital and operating expenses, a typical residential water and sewerage bill

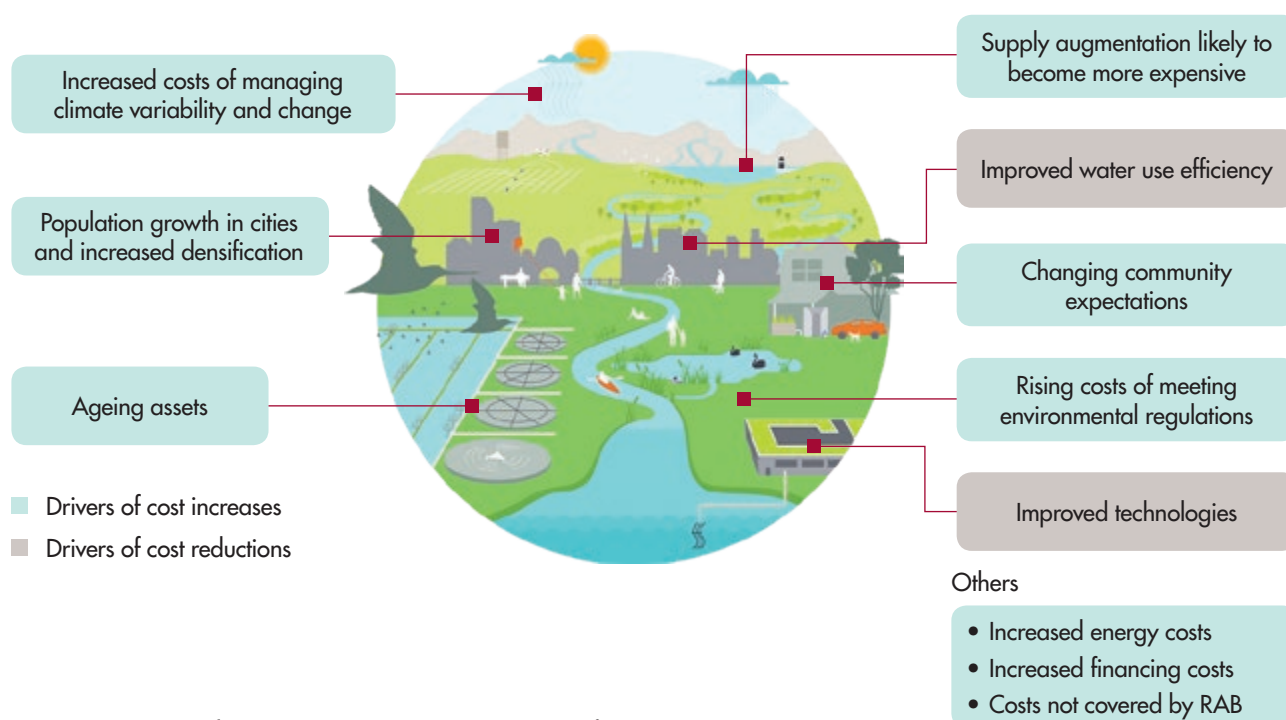
could rise by around \$600 in today's money over the next ten years. This would see the average bill increase from \$1,226 in 2017 to \$1,827 in 2027. By 2040, the average bill could be as high as \$2,553 in real terms – more than double what it is today. This potential increase is illustrated in **Figure B**.

The impact of these changes on household affordability could be substantial. For many families, growth in bills of this scale could cause significant hardship. In the context of slow wage growth and rising cost of living pressures, including increasing bills across other forms of infrastructure, it is imperative that the urban water sector ensures services remain affordable. Managing emerging cost drivers should therefore be front of mind for governments, regulators and utilities alike.

The challenges facing the urban water sector require lasting solutions that focus on efficiency as a key priority. Short-term measures such as running down legacy assets will do nothing to address long-term affordability of urban water services – in fact, such measures are likely to exacerbate cost issues. Instead, utilities – with the support of governments and regulators – should look to forward-thinking, efficiency-enhancing solutions to service delivery and network management. Advances in technologies, processes and analysis can help utilities to extract more value from existing assets, which can lead to better services at lower costs.

Addressing cost pressures over coming years and decades requires reforms of planning and regulatory frameworks across the country, as well as refinement of governance structures.

Figure A: A snapshot of factors influencing urban water bills over coming decades



Source: Aither (2017)¹ adapted from Melbourne Water (2017)²

New skills and expertise will be required across the urban water sector to guide these changes, to deliver and support service improvements, and to develop Australia as a global leader in urban water service delivery.

Past reforms provide a solid foundation, but more needs to be done

Past reform efforts have delivered widespread benefits for urban water customers. Much of the sector has been transformed since the 1990s, with improvements in efficiency, transparency and stakeholder engagement over that time. While urban water service providers remain in public ownership across the country, greater private sector involvement through outsourcing of service delivery functions has led to improvements in innovation and service quality.

These improvements did not happen by accident. Two rounds of major national reforms – the 1994 COAG Reform Framework and the National Water Initiative (NWI) in 2004 – established a foundation for reform across states and territories. These changes were driven within each jurisdiction, with the guidance and leadership of the Australian Government and independent agencies such as the National Water Commission (NWC).

However, reform efforts in urban water have largely stalled over recent years. In many ways, urban water has not kept pace with the rural water sector, which has seen more consistent application of NWI principles. Progress against urban water reform actions, such as moves towards

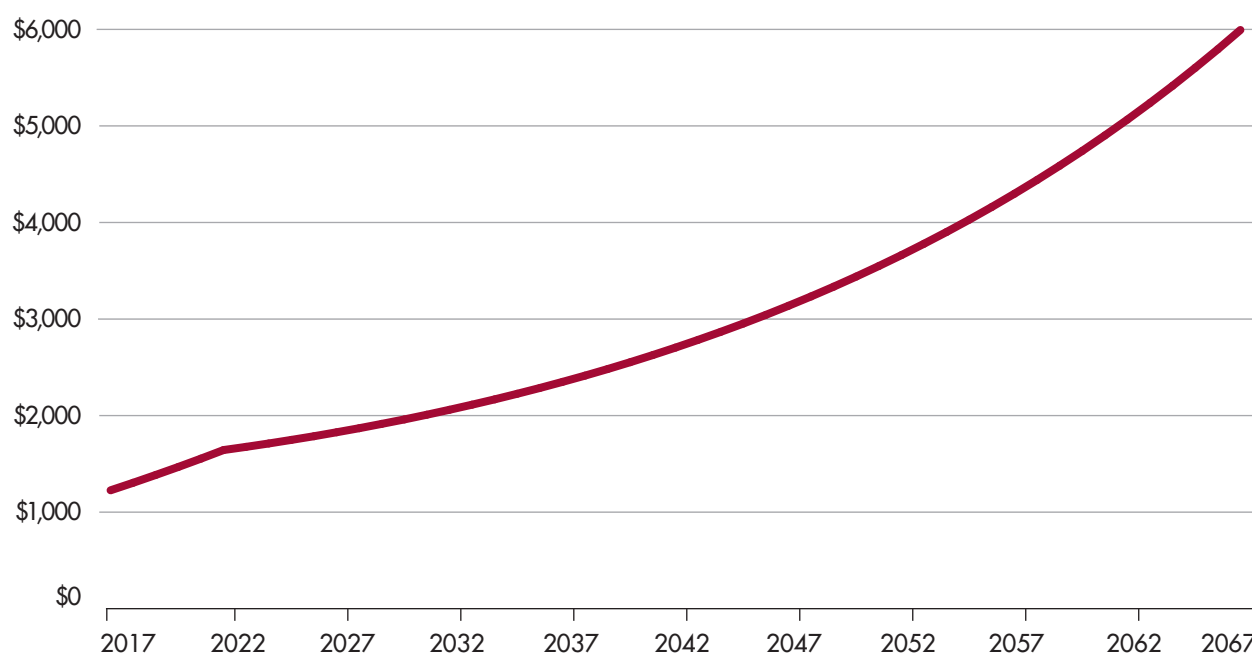
full cost recovery and independent pricing regulation, has slowed. In some jurisdictions reform progress has eroded or even reversed.

Reform efforts to create an efficient, user-focused urban water sector remain incomplete. More work is required to develop stronger market characteristics in each state and territory. There are clear benefits to creating an urban water sector that is well-regulated, open to private sector participation and that provides incentives for innovation, meeting customers' needs and planning efficiently to meet future challenges.

Many lessons on how to efficiently provide urban water services have been learned by governments and utilities in the years following the NWI agreement – most particularly during the Millennium Drought. There has not yet been an opportunity to feed the lessons from this experience into the regulatory and governance frameworks for urban water sector planning and management. The NWI was rural-focused and largely built on lessons of the twentieth century. The time is right for a renewed focus on reform to ensure our urban water sector is best prepared to meet the challenges of this century.

We know that the conditions experienced during the Millennium Drought could re-emerge in the near future. The best time to plan for Australia's water sector is when most dams are full, not empty. It is therefore crucial that water managers take this period as an opportunity to plan and invest more efficiently to meet customers' needs over the long term.

Figure B: Projected average household water and sewerage bills (\$2016)



Source: Aither (2017)³

Clear, user-focused national objectives should underpin reform efforts

Economic, social and environmental shifts present considerable challenges for the urban water sector. In order to manage these challenges, the frameworks that govern and regulate urban water must be refined. Water service providers across the country require effective oversight and guidance to ensure they continue to deliver services that best meet the needs of their customers. This means raising the bar for the institutions and frameworks that govern the urban water sector.

The urban water sector needs strong, straightforward objectives that can be applied across the sector and understood by all stakeholders, from policy-makers and politicians to water customers and taxpayers. This paper identifies four clear national objectives for the sector:

1. a focus on the **long-term interests of users**
2. **efficiency and affordability**
3. **independence, transparency and accountability**
4. **security and resilience.**

These objectives should underpin all decision making and long-term planning in urban water, and act as a touchstone for ensuring that the sector remains focused on securing the best outcomes for users over the long term. These objectives can then provide the basis for a range of reforms. Many of these will bring ‘no-regrets’ improvements to efficiency and accountability that will deliver lasting benefits for users. In some cases, these reforms will be based on principles laid out in previous national agreements. As a result, industry and the community may be comfortable with an accelerated program for implementation.

There is work to be done across all jurisdictions’ regulatory and governance frameworks

In order to advance reform of Australia’s urban water sector against national objectives, we first need to understand each jurisdiction’s starting point. This can provide a foundation for establishing a national reform agenda with clear actions for each state and territory.

Each form of regulation – environmental, health, economic and pricing – has been assessed separately across states and territories to identify those states that lead the way, and others where reform is required to raise regulatory standards. Calling out those jurisdictions that have advanced with reforming their regulatory structures can help to identify what has worked, barriers to reform, and

the benefits these reforms have delivered for operators and customers alike. These lessons can provide vital guidance for states and territories that may be further from best practice in each area of regulation, and establish links across jurisdictional borders to advance important reforms in line with nationally consistent standards.

As the detailed assessment in **Chapter 4** shows, regulatory frameworks vary greatly across states and territories. The standout performers are clearly those jurisdictions that have prioritised reforms through previous national agreements such as the COAG Reform Framework and NWI, and beyond. The experience of Victoria over recent years, and New South Wales before them, provide examples for other states to follow. Many less populous states, including South Australia, Tasmania and the Australian Capital Territory, have excelled in a number of areas of reform despite their scale.

However, no jurisdiction meets best practice across all forms of regulation. This means there is still work to be done across the country to ensure water services are delivered efficiently, securely and transparently – and most crucially, in the long-term interests of customers.

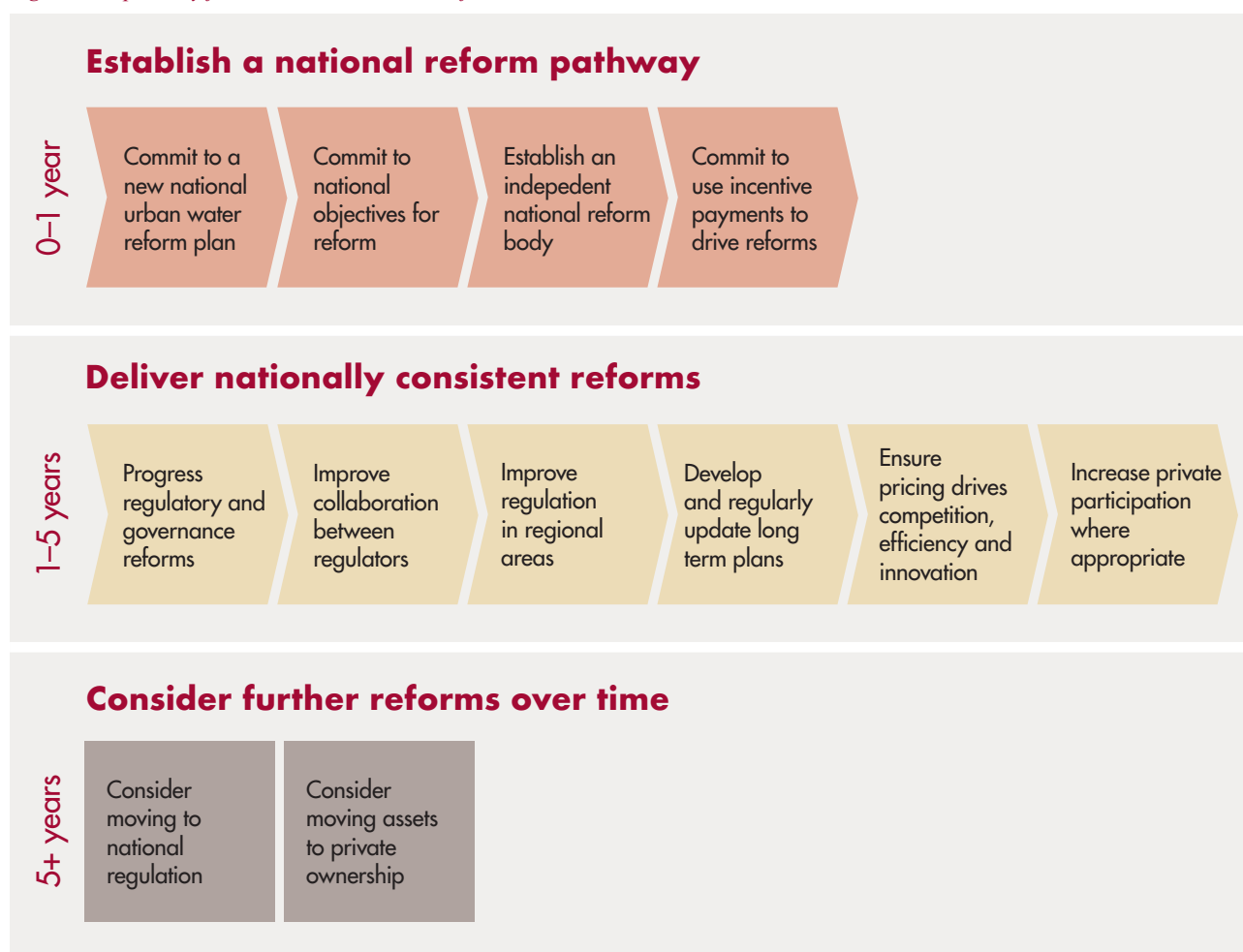
In particular, there is significant scope for progress in regional urban areas, where regulatory standards – particularly in terms of efficiency and transparency – often fall well below those in metropolitan areas. Similarly, a number of states are ripe for reforms to improve the independence, accountability and affordability of their regulatory frameworks. Across all forms of regulation, greater integration and collaboration is required to ensure outcomes align with customers’ needs and willingness to pay.

Australia’s governments need to get on with the task of establishing a reform pathway

The challenge for jurisdictions is not simply understanding what needs to be improved or what models should be adopted. Governments must also focus on how we transition from the status quo to a more efficient, sustainable future urban water sector. Governments should initiate meaningful, lasting reforms. Clear national objectives, targets and milestones over the short, medium and long term can provide a pathway for reform across the urban water sector.

Chapter 5 provides recommendations that set a pathway for reform of Australia’s urban water sector. While many of these reforms will take time to be rolled out, it is important that Australia’s governments get on with the task of initiating reforms. These reforms should proceed in three stages – as illustrated in **Figure C**.

Figure C: A pathway for national urban water reform



Source: Infrastructure Australia

As a first priority, Australia needs a **new national urban water reform plan**. Urban water reforms under the NWI have stalled, and even some reforms initiated under the 1994 COAG Reform Framework remain incomplete. It is not surprising that the NWI has lost relevance in the urban water sector – much has changed in the 13 years since it was first put in place. The NWI’s relatively soft targets for urban water have not led to the widespread and sustained reforms that the sector requires. The time is right for a new national reform plan that focuses on urban water. The important reforms to rural water under the NWI should be continued under an amended agreement that focuses on that sector.

Reform should be guided by a **set of clear national objectives** agreed by all governments. Clear national objectives can help to frame discussions about urban water reform and provide a basis for all stakeholders in the urban water sector – across governments, regulators, utilities and communities – to engage with a national reform effort.

Given the scale of change required to advance urban water reforms, there is a clear need for a dedicated **independent national urban water reform body** to provide strong

national leadership. This leadership should build on the previous successes of the NWC, and energise governments and communities to take actions needed to progress national urban water reform over coming decades. While the Productivity Commission has been tasked with undertaking triennial assessments of progress against the NWI, this does not provide the same benefits as a reform body that can provide continuous guidance to the industry and governments, and to monitor ongoing progress against national reform targets in real time.

Any national reform agenda must recognise that the bulk of reform will need to be carried out by each state and territory government. Many of these reforms will be complex and require each jurisdiction’s government to build support for change by effectively communicating to users and taxpayers the need for urban water reform, and the benefits it could bring. The Australian Government can and should use its funding position to drive the implementation of wider reforms by **providing incentive payments** – additional funding above existing projected allocations – in return for delivery of agreed reforms.

This first stage – establishing a national reform pathway – can and should be undertaken by the end of 2018, 12 months following the completion of the Productivity Commission’s inquiry report on *National Water Reform*.

The second stage – rolling out nationally consistent reforms – should be implemented over the next five years. This includes a range of **refinements to regulation and governance** in each state and territory, as well as **improvements to long-term planning and pricing frameworks**, and **enhanced collaboration between regulators**. **Regional outcomes should be prioritised** to ensure customers outside major cities also benefit from progress in urban water delivery. **Private participation should be encouraged** where there is potential for it to improve services and reduce costs.

The final stage should be considered following delivery of nationally consistent reforms. **Moving to a national regulator and privatising urban water assets** could provide substantial benefits to customers if implemented in the right way – but the sector should be reformed first. These future decisions are not inevitable consequences of broader reform, but present opportunities for future governments to consider.

This paper builds on recommendations in the *Australian Infrastructure Plan*

The *Australian Infrastructure Plan*, published in February 2016, outlined an evidence-based pathway towards more efficient and productive infrastructure for Australia’s future. The Plan made the following recommendations about the urban water sector:

Recommendation 6.10

Governments should define a pathway to transfer state-owned metropolitan water utility businesses to private ownership to deliver more cost-effective, customer-responsive services.

That pathway will:

- implement policy and institutional reforms to promote competitive neutrality in advance of privatisation, including full cost recovery pricing and commercial rates of return on capital
- introduce independent economic regulation, with the potential for the regulatory framework to be set nationally to avoid perceived conflicts of interest
- apply uniform drinking water quality and environmental regulation.

These reforms should be delivered within five years.

Recommendation 6.12

The Australian Government should work with state and territory governments to establish an independent national body to deliver a National Water Reform Plan and drive market reforms across the metropolitan and regional water sectors. Water is critical to Australia’s economic prosperity and environment, and to our social and cultural life. The plan should build on the success of the National Water Initiative, and the body which will deliver it should energise governments and communities to take actions needed to progress national water resource management over the coming decade.

This paper, as part of Infrastructure Australia’s *Reform Series*, builds on these recommendations in the Plan, providing further evidence and advice to all government on the pathways and mechanisms required to deliver enduring urban water reform. This paper is structured into five chapters:

1. **Background:** An overview of the importance of the urban water sector and a brief summary of past reform efforts
2. **The case for reform:** Outlines the various challenges facing the urban water sector, and the potential impact on customers’ bills if these are not adequately addressed
3. **National objectives:** Establishes a set of clear national objectives, and applies these to each form of urban water regulation
4. **Benchmarking:** Assessment of Australia’s urban water regulatory frameworks across each state and territory
5. **Pathway for reform:** Sets a clear pathway through which to deliver lasting urban water reforms.

Reform should build on the work of the Productivity Commission

The Productivity Commission is expected to provide its final inquiry report on *National Water Reform* to the Australian Government in December 2017. This inquiry is tasked with undertaking an assessment of progress towards achieving the objectives and outcomes of the NWI. The Productivity Commission is required to assess drivers of reform, the adequacy of NWI reforms, future challenges and the role of the NWI in improving reform outcomes.⁴



The Productivity Commission’s inquiry process provides an excellent opportunity to engage a broad set of stakeholders on the need for reform and how it should be implemented. While this inquiry does not solely focus on urban water reform, it provides a platform on which to build the case for further reforms of the urban water sector beyond those laid out in the NWI.

Infrastructure Australia’s paper does not seek to duplicate the Productivity Commission’s work but to support its core mission in building the case for reform, and establishing a viable pathway for reform. It will be essential to harness the momentum created through this inquiry, and transform this into committed actions to reform the urban water sector.

Recommendations

1. **The Australian Government should agree to establish a new national urban water reform plan with all state and territory governments.** A new national plan that focuses on urban water is required to reinvigorate reform processes that were initiated through previous broad national water agreements, but through which reform progress has stalled. Agreement to establish this reform plan should be sought through the Council of Australian Governments, and the National Water Initiative should be amended to focus solely on rural water reforms.
2. **The Australian Government should agree to a set of national objectives to guide the reform efforts of all state and territory governments.** These should be agreed to through the Council of Australian Governments and should be drawn from the following proposed objectives:
 1. a focus on the long-term interests of users
 2. efficiency and affordability
 3. independence, transparency and accountability
 4. security and resilience.
3. **The Australian Government should establish an independent national body to drive urban water reforms.** This body should be tasked with guiding reform across all states and territories, sharing lessons across jurisdictions, monitoring reform progress, and providing regular publicly available reports to the Council of Australian Governments.
4. **The Australian Government should provide incentive payments to state and territory governments for urban water reforms.** Incentive payments should be provided – above and beyond existing projected allocations – for achievement of agreed reform targets. This process should recognise the various starting points of each jurisdiction, and provide payments at milestones, with protections against back-sliding.
5. **Reforms to regulatory and governance frameworks should be progressed across all jurisdictions.** A national reform body should undertake an assessment of each jurisdiction's current frameworks, and establish clear milestones for reform actions that focus on securing better outcomes for users over the long term.
6. **Regulators should implement transparent processes to improve collaboration on urban water within their jurisdictions, establish clear delineation of regulatory functions, and drive the achievement of common objectives.** The new national urban water reform body should establish a structured framework to draw lessons from reform leaders and share them with other jurisdictions, and to monitor progress of regulatory reform across the country.
7. **Australian governments should prioritise improving urban water services in regional areas.** Reform efforts in regional areas should reflect national objectives but work with local water managers to develop reforms that suit each area's unique features and challenges. These reforms should focus on:
 - increasing scale wherever possible to improve efficiency
 - improving cost transparency and cost recovery, including a shift from grant funding to community service obligations
 - developing more transparent frameworks for monitoring compliance with health and environmental regulations.



An independent national body should undertake ongoing reviews of urban water outcomes in regional areas and monitor compliance with key performance targets.

8. Regulators should require governments and utilities to develop and regularly update plans that best meet the needs of users over the long term, with clear forward funding allocations.

Utilities should seek to minimise costs over a long planning horizon by anticipating future risks and cost drivers, making better use of existing assets, and considering whole-of-asset lifecycles.

Governments should support these outcomes by providing greater certainty over budgetary allocations. Regulators should monitor and report on the adequacy of planning and investment processes in each jurisdiction.

9. Australian governments should ensure that pricing and market rules for urban water promote competition, innovation, efficient investment and improvements in water conservation. Developments in urban water warrant a thorough, strategic review of market rules in each jurisdiction. Over time, governments should consider phasing out postage stamp pricing to a more sophisticated pricing model that delivers better outcomes for all users.

10. Australian governments and utilities should recommit to corporatisation principles and increase private participation in the urban water sector where appropriate. Private participation

through partnerships and contracts with government can bring increased focus on efficiency improvements, innovation and customer-focused service delivery. Governments should look to harness private sector expertise where there are clear benefits for urban water users and taxpayers, and ensure existing settings do not unduly restrict competition and innovation.

11. Once nationally consistent reforms have been rolled out across all jurisdictions, all governments should consider moving to a system of national regulation.

An independent national reform body should make recommendations to the Council of Australian Governments on a timeline for this transition, and provide advice on the actions required to complete it. National regulation of economic and pricing regulation should be prioritised.

12. Once national reforms have been carried out, Australia's governments should consider transitioning state-owned urban water assets to private ownership. Following improvements to the openness and stability of the urban water sector, and once its regulatory and governance frameworks are sufficiently robust, private ownership should be considered in each jurisdiction. Reforms should proceed where state and territory governments have secured community support for change. Regardless of each government's position on ownership of urban water networks, jurisdictions should continue with the reforms outlined in this paper to deliver better long-term outcomes for users.

Background

Progress in urban water reform

At a glance

- Australia's urban water sector provides an essential resource to households and businesses across our cities and towns. Safe, reliable and affordable drinking water, efficient wastewater services, as well as a range of other recycled water, stormwater and flood mitigation services are integral to supporting Australians' way of life.
- Past reform efforts have delivered strong benefits for urban water customers. Much of the sector has been transformed since the 1990s, with improvements in efficiency, cost recovery, transparency and stakeholder engagement over that time. While urban water service providers remain in public ownership across the country, greater private sector involvement through outsourcing service delivery functions has driven positive changes in innovation and service quality.
- Two rounds of major national reforms – the 1994 COAG Reform Framework and the National Water Initiative in 2004 – established a foundation for reform across states and territories. These changes were driven within each jurisdiction, but with the guidance and leadership of the Australian Government and independent agencies such as the National Water Commission.
- However, reform efforts in urban water have largely stalled across much of the country over recent years. In many ways, urban water has fallen behind the rural water sector, which has seen more consistent application of National Water Initiative principles over recent years. Progress against urban water objectives, such as cost-reflective pricing and independent pricing regulation, has slowed – and in some places may have started back-sliding.

1.1 The importance of Australia's urban water sector

Understanding the role of urban water in Australia

The urban water sector provides potable water, wastewater, flood mitigation and stormwater services for the more than 20 million Australians living in more than 9 million connected properties in cities and towns. Services are delivered across more than 200 utilities, which employ around 30,000 people.⁵

This paper focuses on the urban water sector, across its two parts:

- **Metropolitan:** In larger urban areas, such as state and territory capitals, urban water services are typically provided by large utilities. The bulk of services in most cities funded by user charges.



- **Regional urban:** In towns with smaller populations, urban water services are usually provided by local utilities, often run by the local council. These utilities may face a range of distinct challenges, including a lack of scale, remoteness or more extreme climatic conditions when compared to metropolitan areas. As a result, services in these areas are more likely to be at least partially funded by the broader tax base through community service obligations (CSOs).

Urban water assets include everything from dams to desalination plants and wastewater treatment plants, as well as all components of distribution networks, including pipes and pumping stations. Increasingly, urban water assets also include a range of measures to manage and harvest stormwater and recycled water, mitigate floods and support local biodiversity.

There is a strong degree of private participation in some jurisdictions, with services carried out by private firms through a range of partnership and contracting arrangements. Water services are regulated by a range of government-funded bodies in each jurisdiction, although – as this paper will examine in detail – the specific approach to regulating urban water differs greatly across the country.

This paper uses some terminology that is specific to the urban water sector. A glossary of key concepts discussed in this paper can be found at **Appendix A**.

Urban water forms a significant part of the economy – and household bills

Urban water services play a vital role in supporting the welfare, social progress and prosperity of Australia's urban populations. Urban water utilities also provide services to commercial and industrial businesses in cities and towns, supporting growth in productivity and employment across the country.

The quality, reliability and cost of water service delivery have a critical bearing on Australia's economic prosperity. Australia's urban water industry generates annual revenue in excess of \$15 billion and directly accounts for 0.75% of Australia's Gross Domestic Product.⁶ The *Australian Infrastructure Audit* estimated that the annual economic contribution of the urban water sector to the national economy was in the order of \$10.6 billion.⁷

Urban water services also consume a significant portion of household budgets. Inefficient expenditure can have profound impacts on bills and commercial stability, especially since water infrastructure is typically capital-intensive and long-lived.⁸ Annual residential bills covering both water and wastewater services are typically around \$1,200, having risen by an average of 8% per annum over the last five years in real terms.⁹ With increasing pressures on household and business budgets, it is important that urban water sector managers maintain a focus on keeping water bills down over coming years to support broader gains in productivity and prosperity.

This paper does not examine the rural water sector

Outside urban areas, the water sector encompasses a range of other services. These include rural water services, which involves the provision of predominantly non-potable water to customers outside of towns and cities. These services include water used for regional industries such as agriculture, where water is used to grow crops, and mining, where it is used for commodity extraction processes and dust suppression.

As noted in the *Australian Infrastructure Plan*, the rural water sector began moving toward a market-based model in the 1980s, with further substantial reform agreed by all governments through the National Water Initiative (NWI). Through this commitment, the rural water sector, especially in the Murray-Darling Basin, has been transformed from a system of water rights tied to land titles to one with separation of water entitlements from land, and the introduction of temporary and permanent trading within and between irrigation areas. While some

issues with this sector are yet to be fully resolved, water trading now enables flexible and autonomous reallocation of water based on tradeable allocations and entitlements in many parts of Australia.

Both parts of the water sector – urban and rural – provide essential services to Australian communities. There is some sharing of bulk water assets across urban and rural applications, and scope for further sharing to enable greater efficiency. However, this overlap remains relatively minor in the scale of Australia's total water sector.

There is scope for further reform of rural water, as indicated in the *Australian Infrastructure Plan*. However, these reform processes should be considered separately to those in urban water, which faces distinct challenges in providing water services to urban populations. Rather, rural water reforms should be guided by the range of government authorities charged with oversight, regulation and review of this part of the sector, including the Murray Darling Basin Authority, the Productivity Commission through its planned inquiry into the Basin Plan in 2018, and the Council of Australian Governments (COAG).

Key stakeholders in the urban water sector

The urban water sector bears many similarities to other infrastructure sectors. Services are typically supplied by businesses, regulated by governments and paid for by customers.

However, the sector is also unique in a number of ways. These differences are in part due to the physical challenges of moving water to where it is needed, and the multifaceted role water plays in delivering economic, environmental and social outcomes. Water services are delivered and managed in different ways across the country, according to the specific needs and geographical constraints of each community, and the disparate market structures in each state and territory.

The key stakeholders discussed in this paper and the different terms used to refer to them include:

- **Policy-makers:** These are the government agencies charged with developing policy and advising Ministers on rules and legislation in each jurisdiction. Each federal, state and territory government has at least one agency responsible for developing water policy, and many jurisdictions have multiple departments covering the various forms of urban water policy.
- **Regulators:** Urban water services are regulated in each state and territory by economic, health and environmental regulators. Price setting is generally undertaken by the same agency as the economic regulator, but in some jurisdictions, price setting is subject to Ministerial direction. **Chapter 4** discusses the role of regulators in more detail.
- **Users:** Also referred to as consumers or customers, these are the households, businesses and communities that receive urban water services. In metropolitan areas, users generally receive a range of water, wastewater and other services to their connected property. Some users, particularly in regional areas, may not receive the full range of services from their local utilities, either because the services are not offered or because the user chooses to supply their own.
- **Utilities:** Otherwise known as businesses or service providers, these are responsible for providing bulk and retail water, wastewater treatment and other services to customers, and typically collecting user charges. In most metropolitan areas, these are retailer-distributors, which purchase water from wholesale providers and on-sell services to consumers, although the structure differs across cities. In regional areas, the local government may own and operate the utility, and collect user charges through council rates.



1.2 Reform has delivered strong improvements in urban water

Urban water reforms have brought clear benefits to customers

The urban water sector that exists in Australia today is fundamentally different and much improved from the sector in the early 1990s. Water reforms have been driven by the need to improve economic efficiency and service provision, while also supporting improvements in environmental and broader social policy outcomes.

There are clear benefits to creating an urban water sector that is well-regulated, open to greater private sector participation and provides clearer incentives for innovation, meeting customers' needs and planning efficiently to meet future challenges. Where reforms have been undertaken over recent decades, benefits have broadly included:

- greater independence in investment decision-making and price setting
- enhanced transparency through more independent oversight and reviews
- improvements in reporting of service quality and financial performance data
- efficiency improvements through innovation and greater private sector involvement
- a move towards full cost recovery, strengthening the financial stability of water businesses
- stronger engagement with stakeholders and the community as part of planning, reviews and decision-making processes.

Australians in most cities and towns have come to expect safe, reliable and affordable drinking water through their taps, as well as efficient wastewater and treatment services. Australian users' trust in the urban water sector is characterised by the fact many customers rarely stop to consider how these services are delivered.

Two decades of reform have created an advanced, mature urban water sector

Changes in the water sector are predominantly the result of two discrete, but largely continuous, reform agendas. Both the 1994 COAG Water Reform Framework and the 2004 NWI sought to unlock efficiency gains and improve service quality through a suite of institutional, governance, pricing and regulatory reforms. Each reform agenda was designed to be implemented nationally through inter-governmental agreements.

The first suite of reforms in the Australian water sector came via the COAG Reform Framework, which was part of a broader micro-economic reform agenda known as National Competition Policy (NCP).¹⁰ The COAG Reform Framework laid the foundations for efficient and effective regulation, added clarity to roles and responsibilities, enhanced transparency and accountability, minimised conflicts of interest and encouraged market-based approaches.

Reforms aimed to foster a commercial and competitive focus by corporatising government business enterprises. It also recognised that there was an inherent conflict where a government acted as owner, operator and regulator. Reforms were stimulated by critical Australian Government NCP incentive payments, resulting in many of the COAG Reform Framework's objectives being realised.

Despite these considerable achievements, it was broadly recognised that the COAG Reform Framework required reinvigoration. The NWI was drafted and, in 2004, ratified by all jurisdictions (except Tasmania and Western Australia, which both became signatories in the following two years). The National Water Commission (NWC) was charged with driving implementation of the NWI.

Much of the focus of the NWI was on the rural water sector. For urban water, the NWI required a continuation of many of the reforms that had already been adopted under the NCP program. The NWI includes a series of key elements, objectives and actions for improving water management. For the urban water sector, the NWI required states and territories to:

- promote economically efficient and sustainable use of water resources and water infrastructure assets
- achieve full cost recovery for water services to ensure business viability and avoid monopoly rents
- introduce consumption-based pricing
- encourage innovation in water supply sourcing, treatment, storage and discharge
- use independent bodies to set or review prices or price setting processes.

Despite slow implementation, there is clear evidence that the urban water sector is in better shape as a result of reform initiatives. In particular, the NWI achieved progress in cost recovery, corporatisation of metropolitan water utilities and the establishment of economic regulators. In regional areas, reforms triggered some improvements to service delivery for water and wastewater services, increased economies of scale and resulted in greater transparency in the performance of service providers.

1.3 Understanding the work still to do

We need to build on reform efforts of the past

Two decades of reform, including the COAG Reform Framework and the NWI, have delivered improvements to pricing, institutional arrangements, governance, and service delivery. However, these reform successes should not breed complacency. Continued reform is required to ensure the urban water sector can deliver high quality services in the face of considerable challenges over coming decades.

In some respects, urban water reform processes have fallen behind the transformation of the rural water sector. Many of the rural water reforms of the NWI have been implemented through ongoing cross-jurisdictional initiatives. However, progress against urban water objectives, such as the move toward cost-reflective pricing and independent pricing regulation, has largely stalled over recent years. In many areas of Australia, urban water utilities are subject to government interventions that run counter to enduring reform principles, and can impede service providers' capacity to plan for the long-term interests of their customers.

The corporatised delivery model for urban water services, first introduced in the 1990s, brought some improvements, but productivity benefits from this reform have slowed over time. The subsequent reforms initiated and delivered through the NWI have delivered significant benefits across water resource management, trading and environmental management outcomes. While a number of reforms to water planning have improved security and efficiency across the country, the bulk of benefits from the NWI have been felt outside our cities.

The NWI worked as a nationally consistent framework for advancing reform. However, many jurisdictions have still not fully implemented objectives that were agreed to more than 20 years ago in the COAG Reform Framework. A market, regulatory and planning system that optimises the long-term interests of users while balancing economic, environmental and health outcomes remains an aspiration, rather than reality.

In part, progress on urban water reform has been constrained by soft, 'insufficiently challenging'¹¹ NWI urban water reform objectives. The NWI's broad guidance and lack of specificity toward the urban water sector has not provided an adequate platform for the scale of change that is required.¹² Conversely, where aspects of the NWI have been satisfied, such as most major metropolitan water utilities adopting full cost recovery, there has been a dampening of enthusiasm for further improvements.



This view is supported by the 2015 *National Competition Policy Review (Harper Review)*, which found that despite the reform platform from the 1990s being partially implemented, the urban water sector had been slow in unlocking its full potential.¹³ Industry groups such as the Water Services Association of Australia (WSAA), Infrastructure Partnerships Australia (IPA) and the Australian Academy of Technological Sciences and Engineering (ATSE) have also called for reinvigoration of reform momentum.

Past reform efforts have benefited from strong national leadership

National water reform requires not only agreement across governments and the support of industry and the community, but also strong national leadership. A clear lesson from the successes and failures of past reform efforts is that a national body can coordinate, monitor and report on progress across jurisdictions, and advocate for further changes.

For the NWI, the responsibility for leading reform efforts rested with the NWC. However, in 2014 the NWC was abolished. The rationale for this decision was that there was no longer a requirement for a standalone agency due to progress against NWI objectives, and fiscal constraints.¹⁴ The key functions of the NWC were allocated to the Productivity Commission, the (then) Department of the Environment, and the Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES).

In the absence of the NWC, there is no current independent body with a specific mission to advance national water reform efforts. This point was highlighted in the *Australian Infrastructure Plan*, which argued that Australia lacks the leadership structure required to energise governments and communities to take actions needed to progress national water resource management over the coming decade. This position built on the recommendations of the *Harper Review*. Specifically, the Plan called for a national body to oversee the implementation of new national water reform that would:

- identify areas where further actions are needed to complete reforms agreed under the NWI
- establish better regulations for metropolitan water supply, including a credible pathway for the privatisation of metropolitan water businesses
- determine whether existing governance arrangements are appropriate to meet long-term challenges facing metropolitan, regional urban and rural water sectors
- consider opportunities to address regional and remote safe and secure potable water supply challenges.¹⁵

This paper renews the call for an independent national body to lead reform of urban water. **Chapter 5** provides a recommended reform pathway for this body to put in place.

The case for reform

Challenges facing the urban water sector

At a glance

- Australians' expectations for urban water services are a credit to the achievements of the sector over many decades, supported by the reform efforts outlined in **Chapter 1**.
- However, the urban water sector cannot afford to rest on its laurels. This chapter highlights a range of emerging pressures that could challenge Australians' expectations for water supply, demand and other services, including:
 1. meeting the needs of a **growing population**
 2. improving **resilience** and managing the impacts of climate change
 3. maintaining, renewing and replacing **ageing infrastructure**
 4. reflecting changing **community expectations**
 5. **keeping services affordable** for customers and **minimising costs** to taxpayers.
- Many of these drivers are entirely out of the hands of water sector managers. The role of water suppliers is to anticipate the impact of these changes on their capacity to deliver services, and to put in place measures that will minimise their impact on service quality and customers' bills.
- Unless these challenges are effectively addressed, water customers could be exposed to service interruptions and rising bills over coming years and decades.
- A typical residential water and sewerage bill could rise by around half in today's money over the next decade. This would see the average annual household bill increase from around \$1,200 today to over \$1,800 in 2027. By 2040, the average bill could be more than double what it is today in real terms.
- The impact of these changes on household affordability could be substantial. For many families, growth in bills on this scale could cause significant hardship. In the context of slow wage growth and rising cost of living pressures, including increasing bills across other forms of infrastructure, it is imperative that the urban water sector ensures services remain affordable. Managing the cost drivers in this chapter should be front of mind for governments, regulators and utilities alike.



2.1 Meeting the needs of a growing population

Our urban centres are growing rapidly as Australia's economic powerhouses

The *Australian Infrastructure Plan* laid out a major challenge facing all infrastructure sectors: how to keep pace with our fast-growing cities.

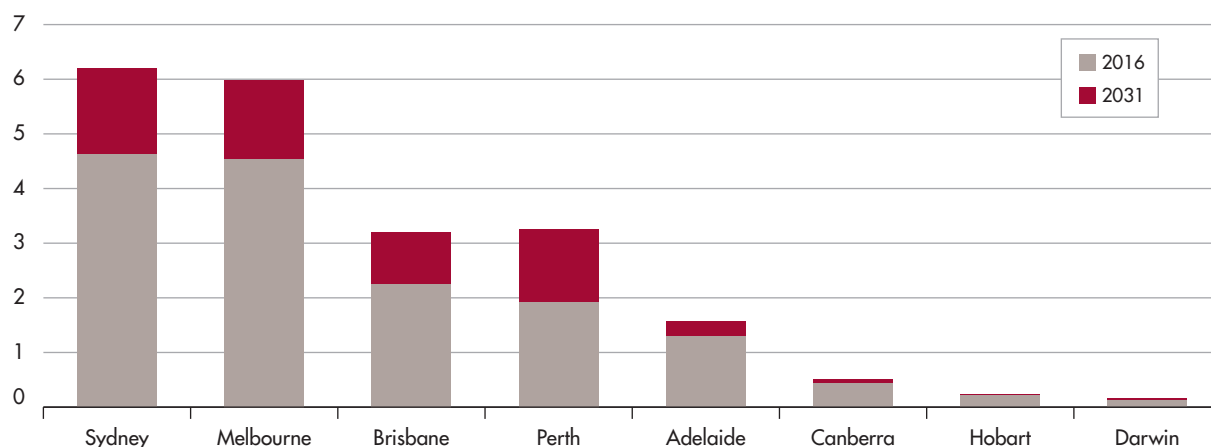
Our major urban centres are developing as Australia's sources of growth, trade and employment, further connecting our economy to the burgeoning Asia-Pacific region. While much of Australia's prosperity throughout the twentieth century was built on the strength of its manufacturing and resources sectors, changing global markets means we need to create new sources of growth and productivity to provide opportunities for all Australians.

As outlined in **Chapter 1**, the urban water sector has played a vital role in supporting Australia's strong growth over recent decades. The importance of this role is likely to develop over coming years, as our population grows and becomes increasingly urbanised.

Australia's population is projected to grow to over 30 million by 2030.¹⁶ The bulk of this growth is occurring in Australia's four largest cities – Sydney, Melbourne, Brisbane and Perth. These cities alone are expected to house an additional 5.9 million people over the 20 years to 2031. Sydney and Melbourne's populations will each swell to around 6 million, while Brisbane and Perth will both exceed 3 million. The scale of this growth is illustrated in **Figure 1**.

Beyond these major cities, a number of smaller centres are also expected to grow. In particular, the areas around the east coast capitals – including Wollongong, Newcastle and

Figure 1: Australia's urban populations in 2016 and projected to 2031 (millions)



Source: Australian Bureau of Statistics (2013)¹⁷ and (2017)¹⁸

the Central Coast, Gold Coast and the Sunshine Coast, and Geelong – will likely absorb some of the demand for their neighbouring cities. Hobart, Adelaide and Canberra will also continue to grow, albeit more slowly than the larger capitals.

Population growth is likely to bring new challenges for urban water infrastructure

The *Australian Infrastructure Audit* projected that the total number of properties supplied with water and sewerage would increase by around three million over the 20 years to 2031. Total water supplied is projected to double over this period, to over 15,000 gigalitres (GL).¹⁹ Our fast-growing cities will require an increasing supply of potable water to meet growing demand.

The vast majority of Australia's population growth will be concentrated in the south-eastern corner of the continent, placing an increasing strain on existing water infrastructure. In its analysis of urban water consumption and population growth in 2010, WSAA projected that water consumption in Australia's six largest cities would increase by around 40% to 2026 and 66% to 2056 – a total increase of around 1,000 GL each year.²⁰

Meeting the needs of a growing population is likely to come with some costs. Substantial capital investment will be required to keep pace with demand through supply augmentation. Operational and maintenance costs will also rise. While the costs of connecting new households and businesses may be offset through developer charges or levies, ultimately, all expenditure will need to be funded either by customers, or by taxpayers more broadly.

It is therefore essential that investment in urban water infrastructure to cater to Australia's growing population balances affordability with security and sustainability, and minimises costs over the long term. The challenge for governments and utilities will be to ensure this expenditure is efficient, fair, and delivers the best outcomes for water customers and taxpayers.

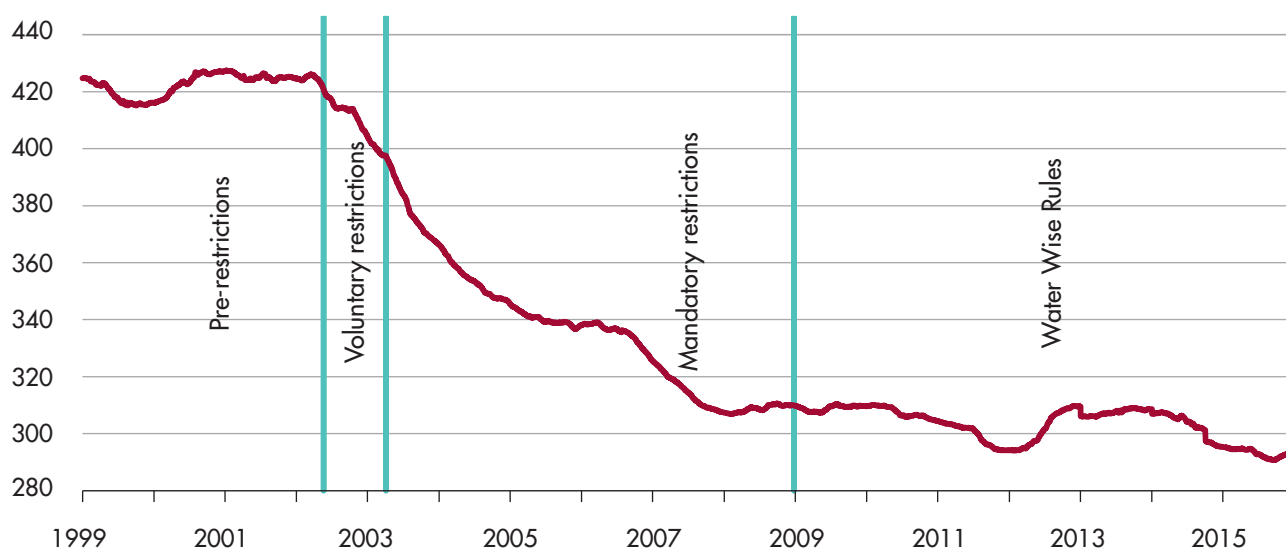
Managing population growth efficiently requires a focus on demand as well as supply

As Australia's urban centres grow, investing to supplement water supply, distribution and wastewater infrastructure is inevitable. However, increased infrastructure capacity cannot be the whole solution to managing population growth. New sources of natural water supply are limited by rainfall and a lack of appropriate sites near cities. Many forms of water supply, such as desalination plants, and other forms of urban water infrastructure are costly to build and operate.

Efficiently meeting the needs of a growing population requires a range of measures to manage demand as well as augment supply. In the water sector, demand management includes a set of powerful tools to influence customer behaviour – among them: price signals, household water efficiency improvements and, where necessary, water use restrictions.

Australian water providers and governments have been largely successful in managing demand through times of strong population growth and droughts. In many of our larger cities, total urban water use has remained relatively flat since the 1980s despite housing millions more people.

Figure 2: Water supplied per person in Sydney 1999 to 2016 (litres)



Source: Sydney Water (2016)²¹

For example, water supplied by Sydney Water decreased by around 20% between 1991 and 2016,²² a period when Sydney's population grew by 25%.²³ Although much of the decline in demand has been driven by Sydney's changing industrial mix, these water savings have also been made possible by a series of policy, pricing, institutional and commercial decisions by governments and utilities.²⁴

In particular, water restrictions have played a critical role in promoting sustainable growth and putting downward pressure on per-capita water use as urban populations have grown and incomes have risen. **Figure 2** highlights the role that water restrictions played – alongside other factors such as rising costs and community education programs – in lowering water use throughout the Millennium Drought.

Water conservation has also been improved through a range of other mechanisms. Updated building standards and government incentives have led to more aerated taps, low flow showerheads, and dual-flush toilets, resulting in substantial reductions in household water use. Notably, these innovations have delivered savings with minimal impact on customer behaviour and without significant increases to user costs.

Utility-led water measures can also help to counter rising demand from population growth. Programs to provide plumbing services to businesses and households experiencing financial hardship and water conservation education campaigns can yield substantial water savings and lower bills to customers. Other measures include reducing losses through leaks, as well as making better use of non-potable sources through systems that enable the harvesting and reuse of rainwater, stormwater or wastewater.

Despite these measures, Australians consume more water per capita than any other country, using an average of 100,000 litres of freshwater per person each year.²⁵ This figure in part represents the importance of water to Australians' way of life – including filling swimming pools, watering gardens and washing cars. It also indicates that there remains scope for changing consumer behaviour, developing innovative means of reducing demand, and driving further reductions in per capita water use.

2.2 Improving resilience and managing the impacts of climate change

Water utilities need to prepare for greater climate volatility

Over coming decades, the impacts of climate change are likely to have a growing influence on how urban water is supplied, used and managed.

Australians are no strangers to extreme weather conditions. Our water sector, particularly in regional areas, has withstood or recovered from countless extreme events such as cyclones and floods, or periods of extended drought. However, what has been considered 'extreme' has shifted over recent decades, and this trend is set to be exacerbated into the foreseeable future. Australia is set to undergo a period of significant change to its weather and climatic patterns. Our infrastructure is likely to be threatened by increasingly frequent and intense weather events, and extended periods of higher temperatures and reduced rainfall.

In particular, the Bureau of Meteorology and CSIRO forecast that over the coming decades climate change is likely to result in:

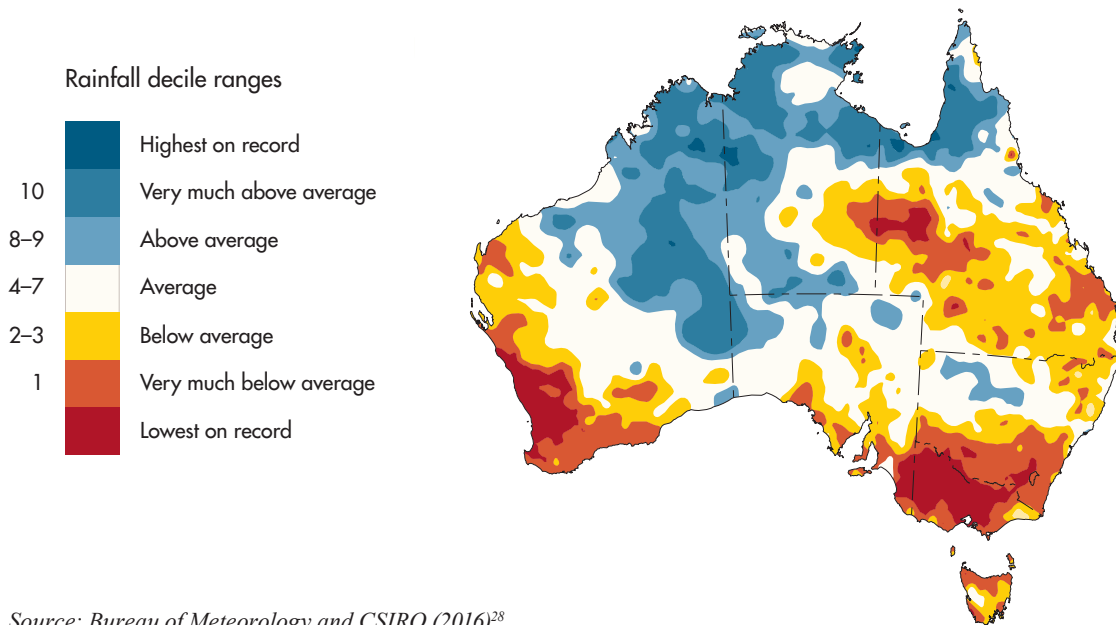
- more frequent and intense rainfall events, particularly in northern regions, potentially causing flooding
- rising temperatures, with more hot days and fewer cool days, bringing increased risks of bushfires and evaporation of water in storage
- rising sea levels, exposing coastal areas to damage and erosion
- ocean acidification, potentially harming marine life and biodiversity
- lower annual average rainfall in southern regions, with increased likelihood of droughts.²⁶

Patterns of climate change are already having a profound impact across Australia. As shown by **Figure 3**, average rainfall across the cooler months (April to October) is below the historical average across Australia's most populous areas. Rainfall in this period, which is the southern growing season, has fallen by around 11% since the mid-1990s.²⁷

A changing climate brings serious risks for the urban water sector

For the urban water sector, climate volatility is not just about risks to supply through reduced rainfall and higher temperatures leading to evaporation. Water systems, across supply, wastewater and stormwater are heavily embedded in local ecosystems. Changes in climate can impact the balance of how water systems interact with the environment, with potentially harmful implications to public health and the sustainability of communities.

The increasing frequency and intensity of extreme weather events must also be a key consideration of utilities. The resilience of assets and systems are likely to be tested by natural disasters such as storms, floods, droughts and bushfires.

Figure 3: Average rainfall from April to October: Past 20 years compared to long-term trend

Source: Bureau of Meteorology and CSIRO (2016)²⁸

For example, higher intensity rainfall events will test the capacity of stormwater systems, treatment plants and sewerage networks. Extended periods of hot, dry weather can lead to pipes cracking as a result of changes in soil moisture or temperature, or as tree roots spread to source water. Sea level rise, storm surge and flooding are likely to affect water and wastewater infrastructure and can result in water contamination issues which impact public health and the environment.²⁹

Across many parts of the country, operators and utilities are already grappling with the challenges of these events from year to year. For instance, the repeated floods and cyclones across Queensland over the past 10 years suggest that these weather patterns are the new norm, rather than an anomaly.

In regional towns, the risks of climate change may be even more pressing than in metropolitan areas. Aside from the greater chance of exposure to extreme temperatures or weather events, regional water utilities do not have the same level of resources as their metropolitan counterparts. In cases of system failure in some regional towns, it may take days or weeks to restore services, which could have serious implications for local households and businesses.

Resilience must be balanced with affordability

Ultimately, it is the community – either as urban water customers or taxpayers – which must pay to manage the impacts of increasing climate volatility. Water sector managers must still balance resilience with affordability.

Resilience at all costs is neither feasible nor efficient. This means that it may not always be possible to protect entire systems from every risk.

The challenge for water managers is to undertake proportionate and efficient risk mitigation. Measures to improve resilience should be tailored to each local context, and should consider customers' capacity to pay. Asset managers should consider the whole-of-life costs of their water infrastructure, including additional costs or savings through operations and maintenance for investments that enhance resilience.

The costs of resilience must also be balanced with the potential costs of inaction. Improvements in resilience will generally come at a cost to customers or taxpayers, but the costs of not adequately managing risks to infrastructure assets and networks can be far greater. Aside from the costs of repair and renewal in the case of extreme weather or network failure, a lack of resilience can cause losses in productivity and connectivity when infrastructure is unavailable.³⁰ For water infrastructure, system failure could also have serious health and environmental costs.

Responses to extreme events should be delivered in collaboration with local emergency services and government agencies. These should prioritise protection of customers in the case of failure, and the re-establishment of services as soon as possible to minimise the economic, social and environmental impact of failure on households, businesses and natural habitats.

The Millennium Drought exposed the vulnerability of the sector to climate change

Many of these risks were borne out over the period from 1996 to 2010, when much of southern Australia experienced severe drought conditions. This led to water shortages across most of Australia's major metropolitan areas, and severely affected vast agricultural areas, including the Murray-Darling Basin.³¹

The Millennium Drought brought an increased focus on shoring up water supply. The scarcity of water across much of the country, and uncertainty over future climate patterns prompted a frenzy of investment to manage growing supply risks. This sharp increase in capital expenditure is illustrated by **Figure 4**, reflecting the construction of desalination plants in many states over a relatively brief period.

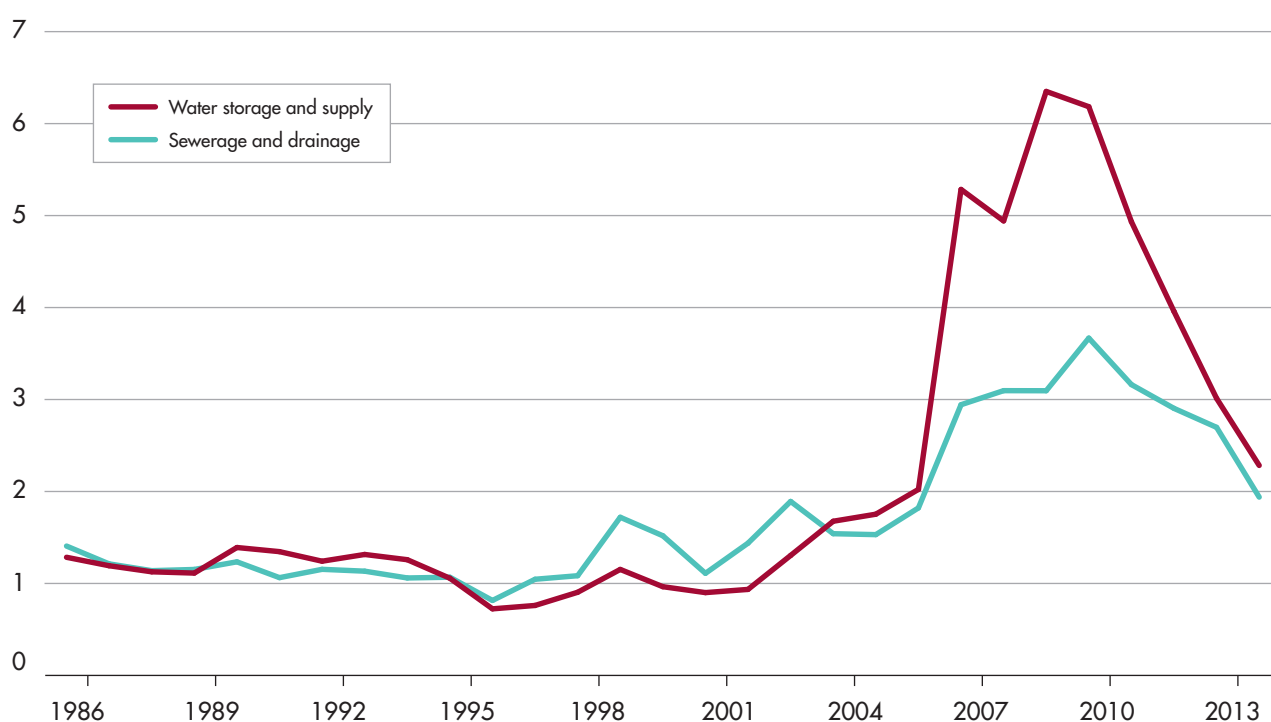
Beyond these large-scale investments, there was also a strong increase in water-related expenditure on a local scale. Many households invested in local harvesting and reuse systems. For example, the proportion of suitable dwellings with a rainwater tank rose from 24% in 2007 to 34% in 2013. This growth was largely attributed to a combination of water restrictions, strengthened building regulations, government rebate schemes, and a stronger desire to conserve water and reduce bills.³²

The Millennium Drought also prompted major investments at the government and utility level. Desalination plants provide supply that is independent of climate conditions, including rainfall patterns, and can be constructed near major cities – consequently, these were generally preferred to traditional forms of bulk water supply, such as dams and groundwater.

Between 2006 and 2012, major desalination plants were built in or near Australia's five largest cities: Sydney, Melbourne, South-East Queensland, Adelaide and Perth. The investments came at a total cost in excess of \$11 billion (\$2016), adding around 534 GL of annual capacity.³³ Smaller, utility-level investments during this period included the expansion of some dams, and infrastructure for water recycling and stormwater harvesting.³⁴

It is important to note that over the period of extended dry weather in southern areas, many northern parts of the country experienced unusually heavy rainfalls. Average annual rainfall in the north was consistently above historical averages, driven by the increased frequency of monsoonal weather events. This rainfall came with its own challenges, with significant flooding, erosion and damage to infrastructure.³⁵

Figure 4: Value of water engineering construction, 1986-87 to 2014-15 (\$ billion)



Note: Figures adjusted by chain volume index

Source: Bureau of Infrastructure Transport and Regional Economics (2016)³⁶

The drought has eased across much of the country, but not in Western Australia

A return of La Niña conditions in 2010 and 2011 brought drought relief to much of the south-east of the continent. These two years were, in fact, Australia's wettest two-year period on record.³⁷ However, the vast majority of this rainfall came during the summer months, continuing the pattern of poor rainfall during the cooler months experienced during the Millennium Drought.

It is important to note that in some parts of the country, particularly in the south-western regions including Perth, the period of drought never really broke. **Figure 5** shows Perth's stream flows since 1911. This clearly illustrates a sustained reduction in inflows over the past 40 years, continuing to today. In this context, the conditions experienced during the Millennium Drought appear to be far from a statistical anomaly.

The patterns of rainfall since 2010 are broadly reflected in how much water each desalination plant has supplied following its construction. As shown by **Figure 6**, only the Perth plants supplied a substantial volume of water in 2015-16 – almost half of the total water supplied to the Perth region for that year. In Melbourne and Sydney, the corresponding plants were not required to augment supply, as natural storages proved sufficient.³⁸

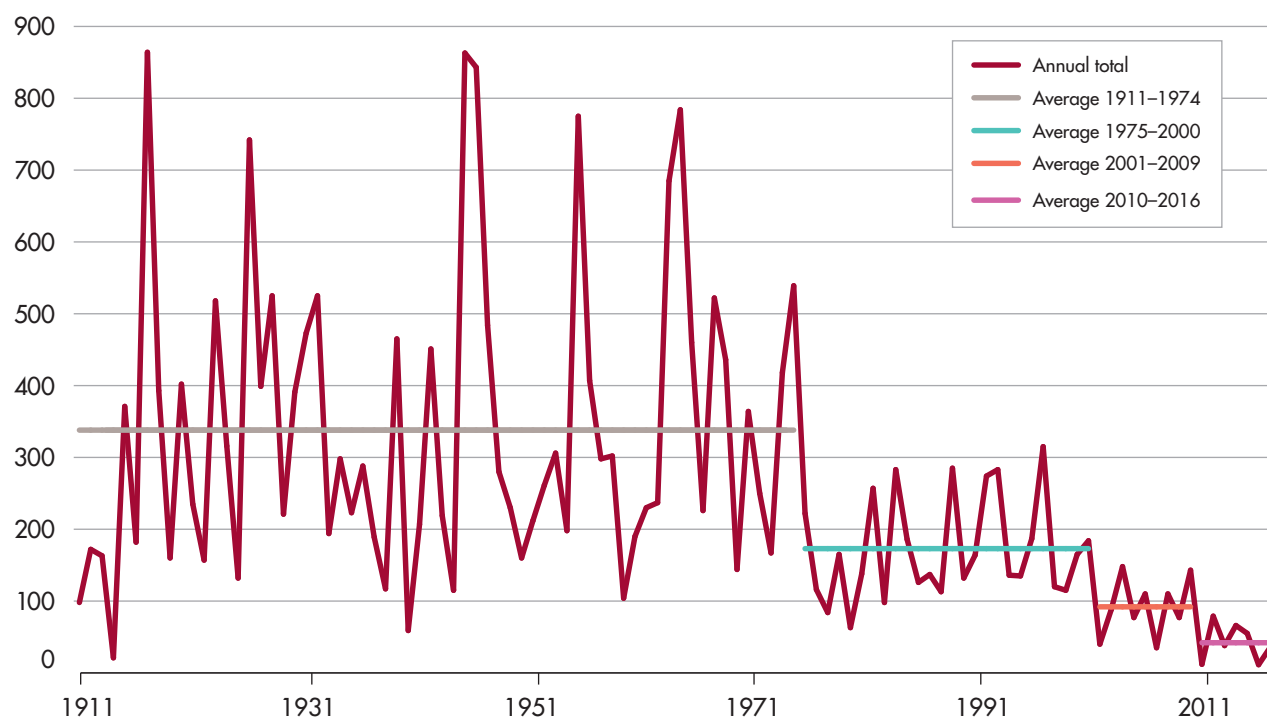
We need to apply lessons from the Millennium Drought

Many of the decisions to invest in desalination plants during the Millennium Drought were a costly response to an immediate challenge – costs that continue to be met through an increase in customer bills or taxes. The costs of improving security of supply across all states could have been reduced had the sector been able to foresee and plan for the supply shortages that emerged before they reached crisis point.

The extreme, sustained and unprecedented climatic conditions across much of Australia during the Millennium Drought came as a surprise to many in the urban water sector. However, we now know that these conditions could re-emerge in the near future. Total supply may not be sufficient to meet increased demand from our growing cities – even with the additional capacity provided by recently constructed desalination plants – and a range of other challenges could place service providers under increasing pressure.

Long-term planning allows service providers to efficiently meet the needs of users. There may be a need for further investment in desalination plants to provide additional capacity in future. However, such investments should only be undertaken after other, less capital-intensive approaches have been considered. These may include

Figure 5: Stream flows into Perth water catchments, 1911 to 2017 (GL)



other forms of supply augmentation, rural-urban water trade, making better use of recycled water for potable or non-potable applications, and demand-side measures such as wholesale scarcity pricing and water conservation efforts through incentives or enforcement.

Although the lessons from the Millennium Drought are clear, there has not yet been an opportunity to feed these into the regulatory, policy and governance frameworks for urban water sector planning and management. The NWI was largely built on lessons of the twentieth century – the time is right for a renewed focus on reform to ensure our urban water sector is best prepared to meet the challenges of this century. The best time to plan for Australia's water sector is when most dams are relatively full, not empty. It is therefore crucial that water managers take this period as an opportunity to plan and invest more efficiently to meet customers' needs over the long term.

2.3 Maintaining, renewing and replacing ageing infrastructure

Our changing cities are putting legacy urban water assets under increasing pressure

Much of the urban water infrastructure we rely on today was built many decades ago. Australia's cities and towns have grown and changed substantially since then.

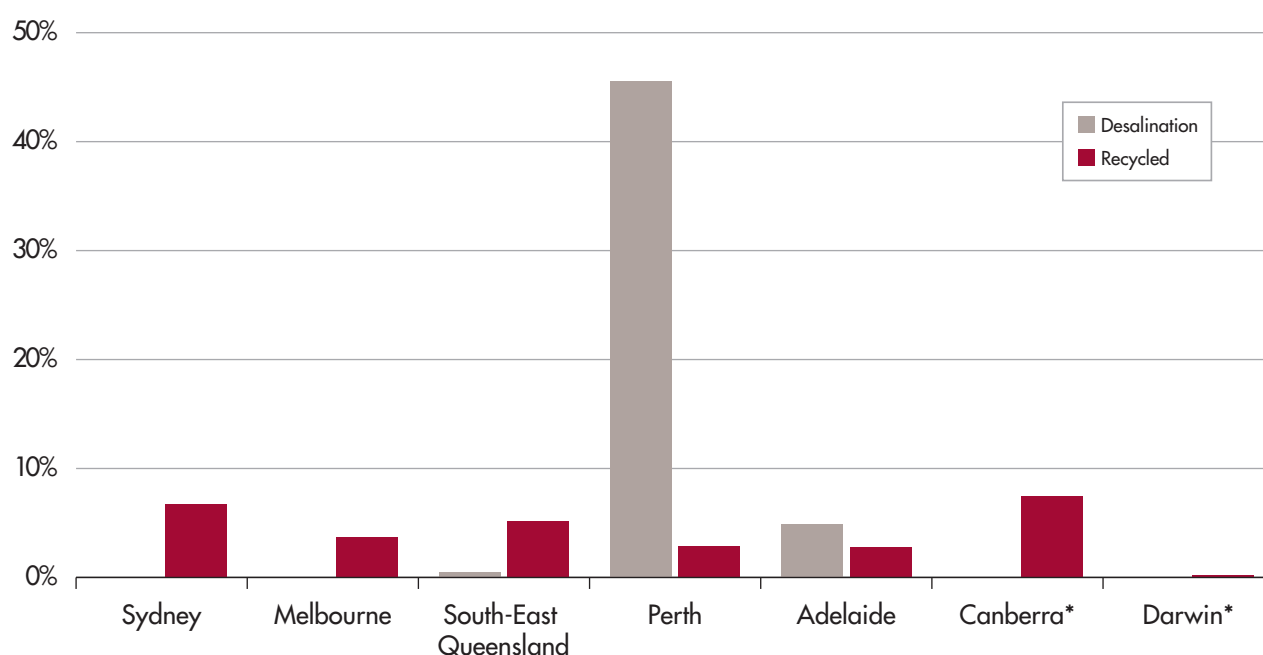
The infrastructure that supported the nation well through a period of rapid growth over recent decades must be adapted and upgraded to support our nation's changing needs.

Some changes in our cities are reducing the average costs of supply services. The growing proportion of multi-unit dwellings in many cities brings efficiencies for water supply, sewerage and other services. The benefits of increased densification could be substantial, with Sydney Water estimating that the cost of servicing greenfield lots is on average five to six times higher than for infill properties.⁴⁰

Growth in infill development is not without its challenges, however. While those in apartments may use less water for their gardens and cars, the increasing density of developments in many urban areas is placing legacy infrastructure under increasing pressure and heightening flooding and fire risks by concentrating patterns of demand within smaller geographic areas, and during peak periods in the morning and evening. Similarly, legacy stormwater systems may struggle with increasing volumes of runoff from dense urban environments.

Many of these challenges and risks can be mitigated through effective urban design and engineering solutions. These should be integrated within broader urban developments, with costs at least in part borne by

Figure 6: Proportion of water from desalination plants and recycled water in capital cities, 2015-16



*Canberra and Darwin do not have desalination facilities installed

Source: Infrastructure Australia analysis of Bureau of Meteorology (2017)⁴¹

the developers and residents who stand to benefit most directly. It is also important that design standards and mandatory conditions of developments are reasonable, and are shown to support improvements in whole-of-network capacity and efficiency, rather than simply shifting challenges to another part of the system.

However, local solutions can only go so far in rapidly growing cities like Sydney and Melbourne. Trunk assets in particular, including stormwater and sewerages systems, in some urban water systems will require a step-change in capacity – and investment – over coming decades.⁴² Other metropolitan networks may require only limited upgrades to handle growth over coming decades.

In regional areas where populations are not growing as quickly, utilities face different challenges. Existing assets may have sufficient capacity to meet local communities' needs for the foreseeable future, but are likely to require renewal or replacement over time to ensure services can meet rising standards and community expectations.

Across metropolitan and regional utilities, the challenge for utilities and regulators is to ensure these investments come at least cost to customers and taxpayers, and that service quality is not compromised as assets are renewed or upgraded. Utilities should provide greater transparency on the state and sufficiency of their urban water assets to meet current and future needs, and should foreshadow if customers are likely to face rising costs to pay for future network enhancements.

In many areas, investment incentives are not aligned with long-term customer interests

At present, a lack of a long-term investment cycle may provide a perverse incentive for some service providers to 'patch up' ageing infrastructure to prolong its life, rather than undertake larger one-off investments to renew or replace assets most efficiently. In some cases, even smaller investments in technology or new processes to make better use of existing assets are not being applied because utilities lack the resources to invest in them.

Annual government budgets often do not provide sufficient certainty for utilities over the planning horizon. Asset managers can apportion their expenditure most efficiently when they have clarity of their forward funding profile. This also allows utilities to invest in networks to best meet customers' long-term needs, rather than ruling out options due to a lack of finance to pay for them upfront.

This challenge is most acute in areas with low cost recovery, where service providers are more likely to be reliant on annual funding from government budgetary processes. Furthermore, many of these service providers are located in regional areas that are more likely to be exposed to the impacts of climate volatility. Long-term

planning is of paramount importance in these areas, to ensure utilities can continue to meet the needs of customers throughout hydrological and budgetary cycles, and to minimise the call on additional taxpayer funding.

There is likely to be scope for sharing lessons between major urban and regional areas. Many larger utilities in metropolitan areas already undertake long-term planning processes due to their scale, increased degree of corporatisation or degree oversight by economic regulators. Governments and regulators should look to share approaches and expertise from these utilities with smaller regional providers, particularly in relation to undertaking audits of assets and best practice planning based on future supply and demand projections.

2.4 Reflecting changing community expectations

Water services must take advantage of shifts in technology and processes

Growing populations and changing urban environments bring new challenges for the urban water sector. As the archetypal Australian home has shifted from the notion of a quarter-acre block with a garden to more compact housing closer to urban centres, so too have the needs of water users. While the proportional growth in apartments has reduced water consumption per dwelling, this shift has also created new environmental challenges.

Water systems – across supply, storage, stormwater and wastewater – must adapt and find new ways of delivering high-quality services in these changing environments. This change will require forward-thinking urban planning and design. In growth areas on the fringes of our cities, the challenge will be to use planning, green spaces and natural local features efficiently and sustainably. For infill areas, smart urban design is required to ensure developments make the most of smaller spaces and integrate water management within building layouts.

Access to shared green spaces, including parks, sporting fields and environmental reserves, have become more important in our cities. These spaces are not only important for the enjoyment of urban communities, but also for improving the sustainability of these denser environments. Natural spaces in cities can help to improve air quality, reduce artificial heating (otherwise known as the 'heat island effect'), support local biodiversity and provide a natural means of water stream filtration.

Technology can also be an enabler of change in urban water. Greater access to real-time information could hold benefits for customers and suppliers. Usage statistics, price signals and service quality feedback could be shared instantaneously, providing scope for issues of supply or demand to be addressed efficiently.



For customers, smart meters or other digital monitors could help to identify leaks or water-intensive appliances in their homes. Real-time usage data could also promote more water-conscious behaviour. Knowing how much water it takes to wash a car or water the garden may provide customers with greater incentive to invest in devices such as hand-held trigger hoses, or to seek more efficient ways of using water.

For suppliers, technology provides increased capacity for providers to receive direct and ongoing feedback from monitoring systems about service quality, interruptions or other issues. This allows faster responses to problems,

saving costs and minimising the impact on services for customers.

Technology also allows customers to be more engaged in guiding decisions about water investments, sustainable practices or service delivery in their communities.

With the proliferation of low-cost forms of mass communication, there is no excuse for providers to make decisions on the basis of assumed customer preferences. This increased transparency should lead to greater accountability of service providers for their decision-making, and potential improvements in investment efficiency.

Understanding the concept of ‘water sensitive cities’

The ‘water sensitive cities’ concept is a policy response to emerging challenges in our growing and changing cities. In particular, the concept seeks to better prepare cities for a future where water supply and management is increasingly influenced by unpredictable and uncontrollable factors such as climate volatility and extreme weather events.

This approach focuses on making urban areas more resilient through an integrated approach to planning, service delivery and community engagement. This includes measures such as:

- harnessing water supply sources within cities, such as rainwater, stormwater and wastewater
- only using fresh drinking water for purposes that require it, and establishing a secondary network of water drawn from other sources that can be used for flushing toilets, watering gardens and washing cars
- linking infrastructure planning with city planning, to ensure developments are sustainable, promote efficient use of water and delivered affordably to customers
- integrating natural elements within urban design to reduce flooding risks, restrict chemical runoff, filter pollutants from waterways and improve liveability in urban developments
- engaging communities meaningfully in planning and decision-making processes.

To assist with the development of this policy area, the Cooperative Research Centre for Water Sensitive Cities was established in July 2012. This research centre is funded and supported by the Australian Government in partnership with a range of government, academic and industry agencies, as well as water utilities and private industry.⁴³

Services should align with the expectations of each community

Australia is a diverse country – geographically, economically and demographically. Different communities have different needs, wants and willingness to pay. A one-size-fits-all approach to water service provision across all cities and towns is neither efficient nor desirable. Utilities may even need to provide tailored options for varying service levels within each community to ensure water services are affordable and suitable for all Australians.

Each community's expectations towards service offerings should form an integral part of investment decision-making. Customer engagement is critical to ensure revenue from users is spent on services that they value. This may include local preferences for green space and how it should be used, stormwater harvesting and reuse systems, management of local waterways, installation of renewable energy sources, and many other possible areas of investment or policy decisions. This engagement should draw from a diverse set of users and other stakeholders, and should monitor changes in expectations over time.

Global best practice is a moving frontier. New technologies, methods or research offer options for changing and improving their practices. While many of these may come at no cost, or may even reduce costs, others require substantial investments to upgrade infrastructure. Innovative changes may deliver enhanced services or public benefits. However, service providers should consider the community's willingness to pay before committing to roll out these upgrades.

Where investments purport to yield public benefits, these should be rigorously analysed to determine their benefits relative to costs before user or taxpayer funding is spent. This is critically important in regional areas, where

funding is likely to be scarce and the repercussions of poorly considered investments could more directly impact a utility's capacity to deliver services efficiently and safely over the long term.

2.5 Keeping services affordable for customers and minimising costs to taxpayers

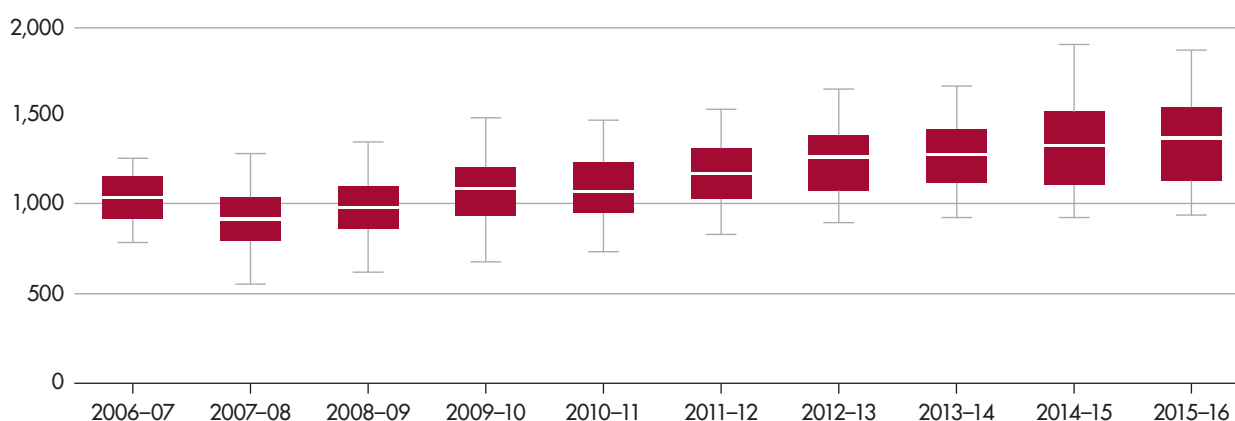
Customers' bills have already started rising in many states

In the context of rising bills for other infrastructure services, such as transport and energy, affordability is a mounting consideration in Australia. Some decisions in these sectors have failed to adequately consider the impact on customers' bills over time. Many decisions have led to large investments that could have been reduced in scale, delayed or avoided through more rigorous investigation of more efficient solutions such as demand management, tariff reform or more network pricing reform.

The *Australian Infrastructure Audit* and *Australian Infrastructure Plan*, as well as reports by NWC,⁴⁴ WSAA,⁴⁵ and IPA⁴⁶ have identified affordability as a principal challenge for the urban water sector. These reports highlight the need for strong collaboration between governments, service providers and regulators to minimise future costs and their impact on customers' bills.

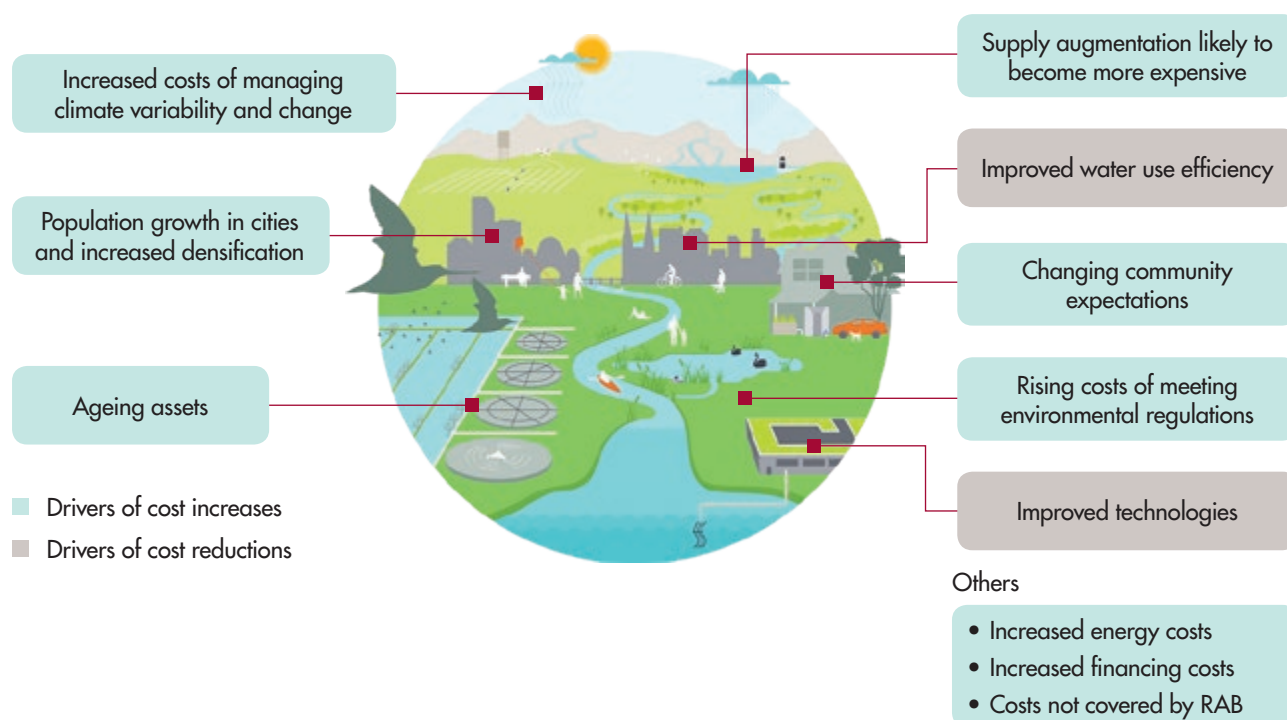
A range of cost pressures in the urban water sector in the years following the Millennium Drought have resulted in real increases in users' bills. **Figure 7** illustrates the increase in the typical residential bills for water and sewerage services over recent years, as well as the wide range of costs charged to customers in different jurisdictions in any given year.

Figure 7: Typical residential bill for water and sewerage – 2006-07 to 2015-16 (\$ per property)



Source: Bureau of Meteorology (2017)⁴⁷

Figure 8: A snapshot of factors influencing urban water bills over coming decades



Source: Aither (2017)⁴⁸ adapted from Melbourne Water (2017)⁴⁹

Bills have increased over recent years despite a decline in capital expenditure and the average water supplied remaining steady over this period.⁵⁰ This trend can, in part, be explained by rising standards and community expectations for water services. Rising values in utilities' regulated asset bases (RABs) have also had an impact. As utilities renew and replace assets that were not included under original price determinations, the value of the RABs has also grown, resulting in higher flow-through costs to customers. Large-scale investments made during the Millennium Drought have pushed up bills as these new assets have been capitalised into the respective utilities' RABs. These RAB values are likely to continue to rise – along with customers' bills – over coming years and decades until all legacy assets have been replaced, and the full depreciated replacement cost of each utility's assets is reflected within its RAB.

A range of cost drivers must be managed to ensure ongoing affordability

Many of the factors discussed in this chapter are beyond the control of the water sector, such as climate variability, or are the result of previous decisions, such as ageing infrastructure in our towns and cities. These factors could bring upward pressure on the costs of delivering urban water services in Australia. A snapshot of these factors is provided in **Figure 8**.

The costs of supplying potable water to a growing customer base in urban areas will likely be higher than in the past. The majority of the most cost-effective

sites for bulk water and wastewater sites have already been utilised, meaning additional capacity will require additional expenditure to enable them to function within the broader system. Similarly, renewing or replacing ageing assets could come at greater cost than when they were first installed, since most urban areas have been built out and could require significant excavation to access these assets.

Not all factors will drive costs up. Some developments, such as improvements in technology through remote telemetry and monitoring of assets, and remote access to usage data through smart meters, could facilitate significant efficiencies in the urban water operations.⁵¹ These forms of technology should be implemented as they become available, in a way that minimises costs to customers. Innovation is an important component of improving service quality, but users should not be unduly burdened with costs of research and development, or expenditure on unproven technologies.

All costs will ultimately have to be met by Australian households. Residential customers are the primary source of funding for urban water and sewerage service provision across the country. As capital and operating costs increase to address these challenges over coming years, and utilities' RABs inevitably grow further through asset renewal and replacement, the burden of responsibility for meeting these costs will fall on these same customers. Any shortfalls in funding that cannot be met by customers will need to be covered by the broader tax base.

The challenge for urban water sector managers is to address these cost drivers as efficiently as possible, and minimise their overall impact on bills.

Without effective action, bills could rise much further

In order to understand the potential impact on affordability of these cost drivers, Infrastructure Australia commissioned modelling to project how challenges facing urban water could affect household bills. This analysis is based on projections of future revenue requirements to cover the costs of managing future cost drivers, as outlined in this chapter and summarised in **Figure 8**.

These projections are based on a ‘building blocks’ water price model for the metropolitan urban water sector. In summary, this model was developed by:

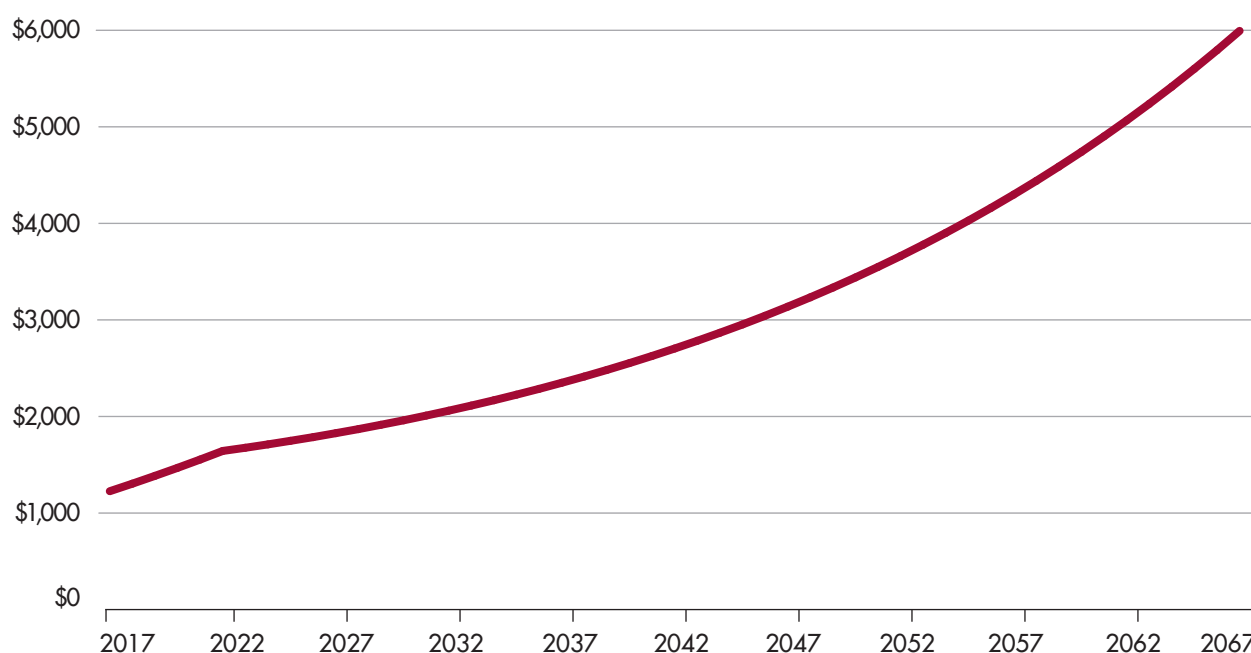
- establishing RAB values for each water utility that services metropolitan areas from price determinations and other available data sources
- calculating an amalgamated metropolitan water revenue requirement
- applying a long-term estimate of the Weighted Average Cost of Capital (WACC) to calculate a return on capital
- calculating representative bills under various possible future expenditure increases, based on best available estimates.

The base case assumes a 4.5% annual increase in capital and operating expenditure for all utilities to manage the cost drivers outlined in this chapter, in line with Global Water Intelligence⁵² forecasts. The base case also assumes a uniform increase in the WACC, rising from 4% in 2017 to 6.4% in 2022, in line with a long-term WACC forecast provided by the Independent Pricing and Regulatory Tribunal (IPART).⁵³ Full details of this modelling, including information on methodology and limitations are included in the technical paper.⁵⁴

This analysis indicates that, without appropriate action to address rising capital and operating expenses, a typical residential water and sewerage bill could rise by around \$600 in today’s money over the next ten years. This would see the average bill increase from \$1,226 in 2017 to \$1,827 in 2027. By 2040, the average bill could be as high as \$2,553 in real terms – more than double what it is today. This potential increase is illustrated in **Figure 9**.

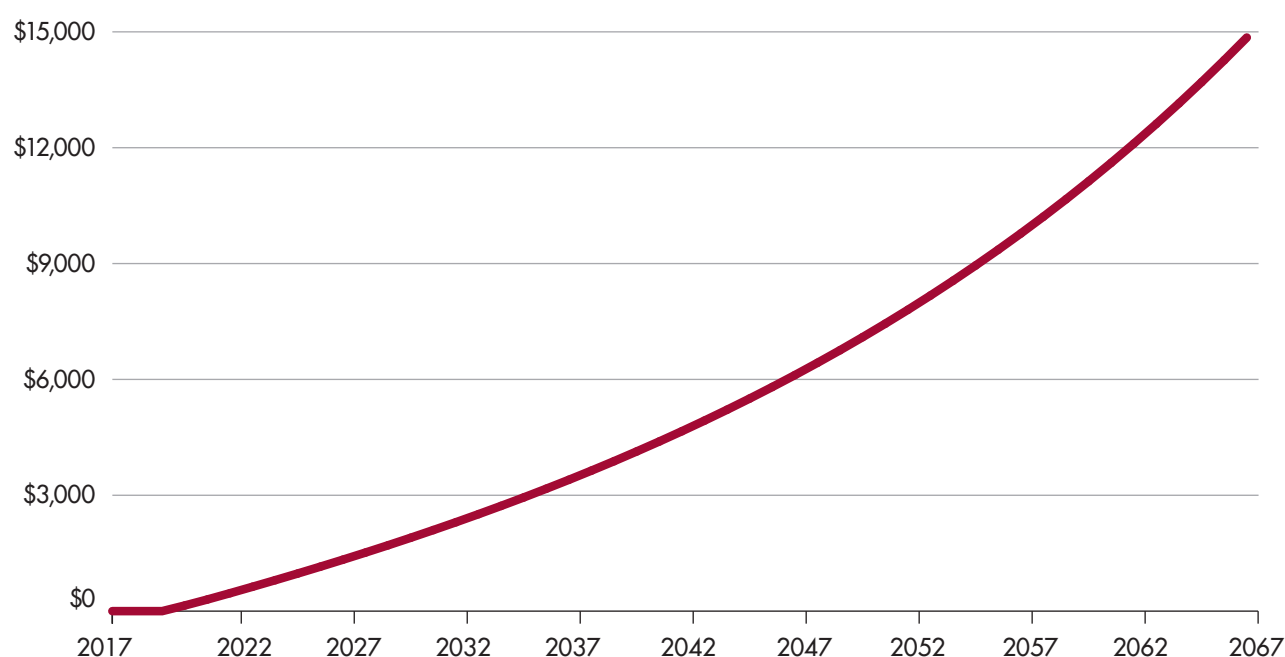
The impact of these changes on household affordability could be substantial. For many families, growth in bills on this scale could cause significant hardship. In the context of slow wage growth and rising cost of living pressures, including increasing bills across other forms of infrastructure, it is imperative that the urban water sector ensures services remain affordable. Managing the cost drivers in this chapter should therefore be front of mind for governments, regulators and utilities alike.

Figure 9: Projected average household water and sewerage bills (\$2016)



Source: Aither (2017)⁵⁵

Figure 10: Cumulative household savings through efficiency gains (\$2016)



Source: Aither (2017)⁵⁶

Efficiency improvements will be essential to maintaining affordability

Action is required to prevent households being exposed to bill increases of this scale. In order to illustrate the potential benefits available through potential improvements in service delivery, the modelling also considered the impact of a 10% annual efficiency gain relative to the base case. This estimated efficiency saving is in line with the savings reported in 2009 *Cave Review* of the gains from water reforms in the UK,⁵⁷ and was also used as the basis for a 2011 NWC study.⁵⁸

This efficiency gain could be made possible by a range of improvements to service delivery and network management. Advances in technologies and processes can help utilities to make better use of existing assets. For example, time and costs could be saved by greater use remote monitoring or the implementation of new treatment techniques, and the energy costs of intensive processes such as wastewater treatment and desalination could be reduced through integration of on-site renewable generation. While some utilities may not be able to achieve this 10% efficiency gain, others may have even greater scope for improvement.

The 10% annual saving has been applied from 2020 to allow time for reforms to be implemented. Under this scenario, each household could expect to save a total \$1,332 in today's money over the next decade compared to the base case. By 2040, the cumulative real savings would reach \$4,135. These potential cumulative savings are shown in **Figure 10**.

The simplicity of this scenario belies the complexity of reforms required to achieve these savings. Clearly the challenges facing the urban water sector require lasting solutions that focus on efficiency as a key priority. Short-term measures such as running down legacy assets will do nothing to address long-term affordability of urban water services – in fact, such measures are likely to exacerbate cost issues.

Addressing cost pressures over coming years and decades requires a commitment to change across the sector. Reform of planning and regulatory frameworks, as well as refinement of governance structures, are required across the country. The following chapters provide a new national reform agenda and pathway for urban water reform to ensure the impact of the cost drivers detailed in this chapter on households is minimised, and the urban water sector is better prepared for the challenges it faces over coming decades.

National objectives

Establishing a foundation for reform

At a glance

- In order to manage the challenges outlined in **Chapter 2**, the frameworks that govern and regulate urban water must be refined. Water service providers across the country require effective oversight and guidance to ensure they continue to deliver services that best meet the needs of their customers.
- The urban water sector needs clear, straightforward objectives that can be applied across jurisdictions, and understood by all stakeholders, from policy-makers and politicians to water customers and taxpayers. This chapter outlines a simple set of objectives for urban water reform:
 1. a focus on the **long-term interests of users**
 2. **efficiency** and **affordability**
 3. **independence, transparency** and **accountability**
 4. **security** and **resilience**.
- These objectives can provide clarity and purpose for discussions about urban water reform over coming years. Having a set of principles agreed by all states and territories can help to articulate the challenge of balancing competing objectives, and to guide reform of the institutions, frameworks and processes that govern urban water utilities.
- This chapter provides discussion of how these objectives should apply through policy settings and regulatory frameworks, now and into the future. These objectives also provide the basis for benchmarking each jurisdiction's current settings against a set of minimum and best practice criteria across each form of regulation – economic, environmental, health and pricing – as laid out in **Chapter 4**.

3.1 Why Australia needs strong, nationally consistent regulatory objectives

The urban water sector needs clearer, more user-focused objectives

Regulation of any infrastructure sector is a complex task of balancing multiple objectives. In urban water, the regulatory task is perhaps even more difficult

than other infrastructure sectors. The sector must manage a range of unique factors, including:

- reliance on weather and climate for most supply
- the physical challenge of transporting water over a vast network



- potential risks to environment and public health from factors across urban water networks
- access to assets, many of which are underground or in remote locations.

These factors vary in their impact on urban water networks across the country. Regulators and utilities must therefore tailor their approaches to suit local conditions. Flexibility is required across regulatory and operational frameworks to harness the expertise of local water managers in delivering water services according to local characteristics, and meeting local community expectations.

Despite the necessary differences in approaches to water service delivery across the country, the urban water sector is bound by some common objectives based on the expectations of customers and taxpayers. All water users in Australian cities and towns expect their water services to be delivered affordably, safely and sustainably. All Australian taxpayers expect urban water to be delivered efficiently, in order to minimise bill increases and imposts on public funds.

Clear, user-focused objectives are not new concepts. Ensuring infrastructure services meet the needs of customers and minimise costs to taxpayers should be intuitive. Many regulators and utilities balance these successfully, sometimes even when these user-focused objectives not being formally established in legislative and regulatory frameworks.

However, we should not take the simplicity and clarity of these objectives for granted. The focus of many regulators can be clouded by a range of other competing or conflicting objectives. Some regulatory frameworks

do not provide sufficient independent, deterministic powers to carry out decisions that are in the long-term interests of customers and taxpayers.

Across all jurisdictions, governments still act as policy-maker, regulator and owner for urban water services. While the degree of independence varies across the country, no jurisdiction's regulatory and governance frameworks are fully and genuinely independent. This means conflicts of interest can arise, and governments may lack sufficient incentives to commit to reforms. National objectives can enhance the accountability of jurisdictions and utilities by allowing all stakeholders to monitor progress against reform commitments.

The importance of clear, actionable objectives is likely to be heightened over coming decades. Regulators and utilities are coming under increasing pressure from the range of factors outlined in **Chapter 2**. Reform is required to ensure Australia's urban water sector is prepared to meet these challenges. The NWC noted that the absence of an agreed set of objectives for the urban water sector leads to 'policies that are ineffective and costly, policies that operate at cross-purposes and confusion between means and ends, and [which] undermine accountability and transparency'.⁵⁹

Clear, national objectives can help to guide reform across all states and territories while providing sufficient autonomy for each jurisdiction to undertake this reform in a way that best meets their communities' needs. At a more granular level, these objectives should provide a touchstone for policy-makers, regulators, and water managers to ensure each decision appropriately reflects the long-term interests of users.

Clarity and strength of regulatory objectives is likely to result in a more independent, transparent, accountable and customer-centric regulator. For example, South Australia's regulatory body, ESCOSA, benefits from a clear purpose and intent: 'the protection of the long-term interests of South-Australian consumers with respect to the price, quality and reliability of essential services'.⁶⁰

National objectives should build on principles agreed to in the past

Of course, national objectives are not new to Australia's urban water sector. A number of previous reports and reform efforts have sought and achieved cross-jurisdictional agreement on national principles for urban water reform. These have evolved from the 1994 COAG Reform Framework, through to the NWI (2004), and its subsequent planning (2008) and pricing (2010) principles.

In 2011, after widespread consultation, the NWC defined a range of objectives for a successful urban water sector.⁶¹ In the same year, the Productivity Commission articulated similar aspirational objectives including an overarching requirement for economic efficiency.⁶² These principles are summarised in the table on the following page.

Each iteration of national principles or objectives has sought to advance urban water reform across jurisdictions. However, as these two sets of principles from the NWC and the Productivity Commission show, the core objectives of reform can be framed in a number of ways. These sets of principles overlap in their intent and substance, but differ greatly in how they are communicated. Some represent aspirations for the sector, others represent reform actions or outcomes. Others, such as a requirement to deliver dividends to government, may actually work against the long-term interests of users by unfairly redistributing the funding burden between some customers and taxpayers, or introducing perverse incentives for utilities and governments.

A commitment to clear, national objectives can support fresh reform efforts

Many of these past sets of principles provided direction to the urban water sector, and have helped to guide reform efforts across some jurisdictions. However, agreement to cross-jurisdictional principles has not always translated into lasting reform efforts. Some principles may have lacked a connection between aspiration and action, or provided insufficient challenge to focus reform efforts.

Lessons from the electricity sector: Simple objectives for a complex task

The urban water sector can draw lessons from the electricity sector, which faces similar challenges in balancing competing objectives of security, affordability and environmental sustainability. As with urban water, Australia's energy regulators, operators and rule-makers must ensure that no one objective is prioritised over others. This is known as Australia's energy trilemma.⁶³

A range of domestic and global factors have increased the pressure on Australia's energy agencies over recent years. These include a transition to new forms of generation, driven by the development of new technologies, commitments to reduce greenhouse gas emissions, and changing consumer and investor preferences. This has been compounded by rising network and retail charges, uncertainty about changing policies, and extreme weather events.

There is no easy solution for the electricity sector. A coordinated effort is required across governments, regulators and industry to ensure the impacts on Australian households and business are contained in the short term, and these challenges are better addressed over the long term.

The importance of clear objectives was highlighted in the *Blueprint for the future security of the National Electricity Market*, led by Dr Alan Finkel. The *Finkel Review* put forward an agenda for reform, including a set of 50 recommended actions across the sector, guided by consultation with Australian and overseas stakeholders. These recommendations were supported by the establishment of four key outcomes that helped to focus reform efforts: increased security, future reliability, rewarding consumers, and lower emissions. These would be supported by three key pillars: an orderly transition, system planning, and stronger governance.

Expressing the challenge in this straightforward manner helped to frame discussion of reforms, and communicate clear goals to a wide audience – including the media and many parts of the community that may have had little interest in or exposure to the electricity sector in the past. The inclusion of a clear timeline for implementing each recommendation helped to establish expectations for change.

NWC objectives (2011) ⁶⁴	Productivity Commission suggested objectives (2011) ⁶⁵
Provide secure, safe, healthy and reliable water-related services to urban communities in an economically efficient and sustainable manner.	<p>The primary objective of the urban water sector is to provide water, wastewater and stormwater services in an economically efficient manner so as to maximise the net benefits to the community. The objective should be met by pursuing the following more specific objectives:</p> <ul style="list-style-type: none"> ■ achieving water security and reliability at lowest expected cost ■ contributing to universal and affordable access to water and wastewater services ■ contributing to public health, flood mitigation and environmental protection.
Understand and meet the long-term interests of all water consumers in the price, quality, safety, reliability and security of supply of fit-for-purpose water and wastewater services through the efficient use of, and investment in, systems, assets and resources.	
Protect public health and the environment by ensuring that the impacts of the sector's operations and investments are managed cost-effectively in accordance with society's expectations and clearly defined obligations.	
Enhance its effective contribution to more liveable, sustainable and economically prosperous cities in circumstances where broader social, public health and environmental benefits and costs are clearly defined and assessed, or where customers or other parties are willing or explicitly obliged to pay for the outcomes.	

This point has been highlighted by NWC,⁶⁶ *Harper Review* and WSAA, which noted that the NWI's soft guidance toward the urban water sector fostered a continuation of the status quo.⁶⁷ This point has also previously been noted by the Productivity Commission, which argued that, 'without clear objectives for the urban water sector the case for reform cannot be assessed or reform options designed'.⁶⁸

That is why clear national objectives should be used as the foundation for a more action-oriented urban water reform agenda. This should draw out the changes required across the governance and operational frameworks, across each form of regulation – environmental, health, economic and pricing – in a way that is clear and understandable to all urban water stakeholders and local communities.

3.2 National objectives for urban water reform



3.2.1 A focus on the long-term interests of users

Users should be at the centre of all urban water sector decisions

Regardless of the complexity of the challenge facing urban water sector managers, their first and last question

when making a decision should be: is this in the best long-term interests of users? This is a common mantra across all forms of infrastructure, but can sometimes be clouded by the complexity of decision-making frameworks which determine how services are delivered.

In urban water, users are impacted by decisions in a number of ways. Service interruptions or declining water quality can have serious consequences for the way people live and businesses operate. Increased costs can cause hardship, especially in the context of rising bills across other forms of infrastructure. Urban water also helps to shape and preserve natural and built environments, an increasingly important role in our rapidly growing cities.

Integrating a user focus into regulatory and operational frameworks means adding intuitive checks and balances into decision-making processes. Services should be delivered to a standard that reflects what customers want and need, at a cost they are prepared to pay. New approaches or technologies should only be applied when they are proven to deliver net benefits to users and communities. Investments that will likely trigger a rise in customers' bills should only be undertaken when absolutely necessary, with independent oversight by economic regulators or when communities have expressed a willingness and capacity to pay.

Regulators should focus on outcomes that work best for users

The regulatory frameworks for urban water are broadly more prescriptive than those in other economic infrastructure sectors. In many ways, this is understandable – water is an essential resource for supporting our way of life. Any failure to provide safe and reliable drinking water and wastewater services could have grave consequences for a community. Failing to appropriately manage wastewater or pollutants in our lakes and waterways could cause severe environmental damage.

Over past decades, risks to urban water have been mitigated through increasingly complex regulations on outputs – for example, specific minimum or maximum levels of nutrients, chemicals and sediment in water for various applications. The core business of urban water regulators has been to enforce these rules, monitor compliance, and issue penalties or other forms of remediation when breaches are detected. However, in some cases this approach has stifled innovation, fallen out of line with community expectations, or inflated users' bills for services from which they derive few clear benefits.

Transforming urban water's regulatory frameworks to make them less focused on outputs and more focused on outcomes requires a rethink of this traditional regulatory mindset. Rather than monitoring compliance with specific regulations that reflect historical best practice, wherever possible, regulators should move to regulatory frameworks that set outcomes that matter to users. Under this approach, governments and industry share responsibility

for encouraging innovation, trialling new approaches and implementing them safely.

As part of this, arbitrary restrictions on specific technologies or processes should be removed where they cannot be shown to address a clear risk to users. While there may be risks and community apprehension associated with processes such as potable reuse, this is no reason to prohibit this broad approach – as is currently the case in a number of states and territories. Service providers should be given the opportunity to prove that the risks of new approaches can be effectively managed, and to be able to engage communities directly to address any fears they may hold.

The benefits of a more outcomes-focused approach could be substantial. Service providers would have greater incentives to innovate through adoption of new processes or technologies. Greater competition would be promoted in urban water, and potable water supplies could be supplemented through more diverse sources when required. These factors, combined with a reduction in the regulatory burden for service providers, could lead to improvements in efficiency or service quality, and a reduction in customers' bills. This approach could also provide a better foundation for Australian service providers to keep pace with global best practice, creating greater opportunities for sharing knowledge and selling products in international markets.

Community engagement is required to make better decisions for users

Acting in the best interests of users requires an understanding of their needs and expectations. Expectations and willingness or capacity to pay will



vary between and within communities, and will change over time. Understanding users' interests requires engagement with communities through a range of formal and informal measures that may include surveys, longitudinal studies, outreach events or ongoing feedback processes.

However, it is not practical or appropriate to seek community feedback on every decision made in the urban water sector. In these cases, a core focus for policy-makers, regulators and service providers should be to make decisions that reflect a deep understanding of what matters most to communities.

Service providers should also look to reach out to those parts of the community that may be more vulnerable to bill rises or changes in water services. This may include providing financial assistance to meet bills through payment plans or concessions, forewarning of any changes in services, or variable service offerings to meet the needs of different subsets of the community.



3.2.2 Efficiency and affordability

Value for money considerations should underpin every decision

This objective follows logically from a focus on the long-term interests of users. We know that most customers expect safe, reliable urban water services delivered at least cost. In order to meet these expectations, urban water regulation and operations must focus on improving efficiency wherever possible, and limiting the impact of new investments on customers' bills.

Improving efficiency requires businesses to make prudent infrastructure investment decisions, and deliver services cost-effectively. Water service providers should have access to the necessary capital to fund new infrastructure and sufficient revenue through cost-reflective user charges to pay for these investments and maintenance. Service delivery costs should be minimised through technical improvements and innovation and independent economic oversight. Compliance costs should be minimised by avoiding excessive information requirements and undertaking regulatory reviews in a timely manner.

Improving efficiency requires more than just reducing costs of existing operations. A range of factors lie outside the control of the sector, including weather patterns and changes in population. Urban water sector managers should anticipate these changes, and focus on limiting their impact on prices through effective long-term planning. As the analysis in **Chapter 2** shows, a failure to adequately

address these cost drivers could lead to substantial increases in household water bills over coming decades.

Efficiency and affordability is not just a challenge for economic regulators

While a primary consideration for economic regulators should be improving efficiency, this discipline must also be extended to environmental and health regulators. This requires integration of approaches to ensure that common regulatory objectives are being met as efficiently as possible across all forms of regulation, and so that no one form of regulation unduly pushes up prices. This requires a risk-based and outcomes-focused approach to all forms of regulation that prioritises investments according to community needs, willingness to pay and value for money.

For environmental regulation, this means that new or improved approaches should be evaluated for their impact on long-term environmental outcomes, with proportionate responses to risks. Environmental objectives and requirements should be outcomes-focused, well-defined, measurable and achievable, and based on customer and community inputs with recognition of the costs involved. Changes to service standards and investments should be assessed for their value for money.

Approaches developed through policies such as water sensitive cities, or integrated water cycle management more broadly, can deliver environmental and social benefits for communities. Many of these measures do not require upfront investment, such as shifts in planning and design to better consider the long-term impacts of development on local environments. In cases where investment is required, these decisions should be subject to rigorous cost-benefit analysis regardless of the apparent strength of the policy case for their implementation. Investments should only proceed where the benefits, based on clear and well-supported evidence, can be shown to outweigh the costs – regardless of whether they will be paid for by customers or taxpayers.

Similarly, efficiency should be a core focus for health regulators. Defined, measured and tailored public health solutions that are fit-for-purpose should be formed with community input, and a clear understanding of costs on bills and taxpayers. Regulators should make decisions based on a detailed consideration of the proportion of the risks it seeks to address, and the investment required to counter it. As such, public health considerations would involve effective risk-based regulation of drinking water quality, effluents and recycled water. Wherever possible, regulators should look to integrate alternative water sources safely, and remain open to innovative solutions to achieve public health outcomes.

Promoting competition and investment through forward-thinking legislation in NSW

Improving competition and encouraging new entrants can improve efficiency and affordability in urban water, which has historically been dominated by government-owned, vertically-integrated utilities. The emergence of alternative water management approaches such as water recycling in new developments and growth of private sector service providers in urban water should be harnessed by governments and regulators as a way of breaking down monopolies and promoting competition for services.

In order to support greater competition in urban water service delivery, the NSW Government introduced the *Water Industry Competition (WIC) Act* in 2006. This effectively created a more level playing field through a licensing and wholesale pricing system for private sector service providers of potable water, recycled water and wastewater services, and a third-party access regime for water and sewerage infrastructure.

The result was a more efficient, market-oriented NSW urban water sector where new entrants had the incentives and access required to invest in new and innovative service delivery models. This encouraged investment in more sustainable practices such as water recycling and sewer mining as part of greenfield developments in urban areas. Approximately 3,000 connected properties received services licensed under the WIC Act in 2015-16.⁶⁹ This figure is likely to grow substantially as more major residential developments in inner Sydney are completed over coming years.



3.2.3 Independence, transparency and accountability

A more open and consultative urban water sector will deliver improved services

Historically, Australia's urban water sector has delivered services to users through government businesses with limited public engagement. However, a range of factors have altered the role of urban water service providers and increased the importance of independence and transparency in the sector. These include rising community expectations, increased private involvement in the sector and mounting pressures on delivery costs. Improvements in technology have also enabled the sharing of real-time information, providing customers with more control over their water services and bills.

These changes can bring significant benefits for urban water businesses and their customers. Enhanced community engagement and transparency can drive improvements in service delivery. Service standards are linked to cost, and customers can provide more input into the setting of service standards and investment decisions in the sector. Increased independence for regulators and service providers can enhance their capacity to make decisions that work in the best interests of customers and drive improvements over a long-term planning horizon.

Every urban water agency should be clear about its roles and responsibilities

Enhancing the clarity of regulatory and operational frameworks would improve transparency and accountability in urban water. Better communication of regulatory objectives would help them to be easily understood and applied.

The performance expectations of water businesses should be clear and measurable. Actual performance should be gauged and reported to decision-makers and the wider community. Performance results should be open to public comment and examination. Trade-offs between costs and service standards should also be a matter of customer choice, whereby water service providers are encouraged to provide tailored customer offerings and service choices to customers.

Similarly, the split of responsibilities between governments and providers should be unambiguous. There should be sound governance arrangements and clear delineation of roles and responsibilities, with rewards for good performance and, where appropriate, the capacity to impose sanctions for poor performance. The role of government should be clearly articulated, with definition of public, shareholder and regulatory rules. Prices should be set independently of government. Ministers and governments should have confidence in the performance of the sector, without needing direct involvement in operational and planning decisions.



3.2.4 Security and resilience

Urban water should be appropriately secured against current and future risks

The urban water sector faces a range of natural and man-made risks, both known and unknown, over coming decades. While it is neither practical nor desirable to ensure urban water is fully resilient to all risks, it is important that the sector strikes an appropriate balance of protecting supplies and users from risks with the efficiency and affordability impacts of managing them.

Preparing for these challenges requires resilience and flexibility. A resilient sector should have sufficient capacity



to withstand external shocks where possible, and to recover quickly from any service disruptions. Resilience also requires a flexible sector, which is able to identify and respond to changing circumstances, as well as diverse customer and community needs.

An unpredictable environment, characterised by variable rainfall and increasingly extreme climatic events requires a clear objective to guide actions. Some cost increases may be inevitable as the sector improves its approach to resilience, but these outcomes should be balanced with the broader regulatory and operational objectives – most particularly the impact on customers' bills.

Regulators and utilities should work together to agree on a portfolio of fit-for-purpose water solutions that meet defined and measurable supply security objectives at least cost. This includes long-term planning to ensure supply can meet demand in each catchment, and any investment to improve resilience is supported by a strong value-for-money proposition. Roles and responsibilities within this planning and delivery cycle should be clearly defined.

Resilience should be enhanced through a mix of capital investments and policy reforms

Many efforts to improve security and resilience will come at cost to governments and utilities. A range of network enhancements to better prepare for growing populations and increasing climate volatility are inherently capital-intensive. Supply augmentation through the construction of dams or desalination plants, as well as other measures such as flood mitigation, come at a significant cost to customers and taxpayers. Governments and utilities must ensure that investment decisions are prudent, made on the basis of rigorous evaluation of costs and benefits using the best available data and analysis, and tied to long-term plans.

On the other hand, there are a range of measures that could improve security and resilience of urban water networks at little or no net cost. These include:

- educating communities on the need for water conservation, and how to use potable water more wisely
- providing incentives for users to conserve potable water supplies – especially renters or other customers who do not pay a charge related to their consumption – including offering discounts or installation for household conservation devices
- identifying waste through leaks in distribution assets or customer connections, and offering to fix minor leaks at end users' households or businesses
- developing a better understanding of hydrological risks by using the range of datasets produced by the CSIRO and Bureau of Meteorology as the basis for long-term investment and risk mitigation plans.

On a larger scale, policy bans on the transfer of water between rural and urban allocations may prevent water from being used for its most productive use. Urban water utilities' willingness and capacity to pay can be far greater than that of irrigators, especially during times of water shortages. As the Millennium Drought showed, if urban water utilities are at risk of lacking sufficient supply, the immediate alternative may be to invest in expensive new infrastructure to augment supply.

Reducing the barriers to trade between these sectors, or providing exceptions to these policy bans at times of drought, could improve resilience for the urban water sector, providing greater opportunities for trade for rural water customers or wholesalers, and reducing costs for urban water utilities. Opportunities for trade should exist where there are benefits to both rural and urban sectors, and could improve economic efficiency by allowing water to be transferred to its highest value use. Governments should consider any potential negative impacts of trade for regional communities on a case-by-case basis.

Benchmarking

Assessment of urban water regulation

At a glance

- This chapter extends the objectives laid out in **Chapter 3** to assess how the regulatory and governance frameworks in urban water are performing across the country. Each jurisdiction's regulatory, governance and pricing frameworks have been assessed against minimum and best practice benchmarks to identify states that lead the way, others where reform has fallen behind, and establish a starting point for further reforms.
- Minimum and best practice criteria have been set in line with the established principles and intent of previous intergovernmental agreements such as the COAG Reform Framework and the NWI. Our standards align with previous commentary by the Productivity Commission and National Water Commission.
- This benchmarking shows that regulatory, governance and pricing settings vary greatly across jurisdictions. The standout performers are those that have prioritised and progressed previously agreed national reforms, most notably Victoria and New South Wales. Some less populous jurisdictions, including South Australia, Tasmania and the Australian Capital Territory, have also excelled in a number of areas of reform despite their scale.
- However, no jurisdiction meets best practice across all forms of regulation and pricing. This means there is still work to be done across the country to ensure water services are delivered efficiently, safely and sustainably – and most crucially, in the long-term interests of customers.
- In particular, there is significant scope for progress in regional urban areas, where regulatory standards – particularly in terms of efficiency and transparency – often fall well below those in metropolitan areas. Similarly, a number of jurisdictions are ripe for reforms to improve the independence and accountability of their regulatory frameworks. Across all forms of regulation, greater integration and collaboration is required to ensure outcomes meet the customers' needs and willingness to pay.
- It is important to note that the benchmarking in this chapter is not a measurement of service quality outcomes, or an assessment of the performance of the people and agencies in each state and territory (government departments, regulators and utilities). Rather, this benchmarking assesses the regulatory and governance system in which these people and agencies operate.



4.1 Applying national objectives to each form of urban water regulation

Objectives should be applied across all parts of the sector

To be effective in supporting urban water reform, the national objectives outlined in Chapter 3 must be applied to the complex frameworks, processes and institutions of the sector – across all forms of regulation. This includes the range of elements in each jurisdiction’s regulatory framework:

- **governance arrangements and planning:** including regulatory objectives and principles, institutional form, structure and organisational capacity, powers and functions and review and appeals mechanisms
- **regulatory approaches and instruments:** including use of traditional and alternative approaches and forms of regulation
- **decision making processes:** including process for setting prices and standards, incorporating stakeholder engagement and interaction between regulators.

Figure 11 provides a high-level summary of these frameworks and structures.

Minimum and best practice criteria can focus reform efforts in each jurisdiction

A challenge that any national urban water reform agenda must overcome is the different starting points for each state and territory. Past reform efforts have left jurisdictions at various stages of progress. Recognising

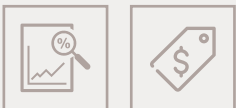


this challenge, this paper establishes a minimum and best practice standard for each form of regulation and pricing against our proposed national objectives.

Across economic, environmental and health regulation and pricing, the minimum and best practice criteria have been drawn largely from common, long-standing principles in urban water. These standards have been distilled from the range of national agreements and reviews, and summarised into a straightforward set of criteria for each form of regulation.

Minimum standard criteria seek to establish a base for community expectations. Given the various rounds of urban water reforms, it would be reasonable for communities to expect that their jurisdiction’s framework is meeting minimum standards. For example, while it may not be reasonable to expect every jurisdiction to have achieved full cost recovery, a reasonable expectation would be for there to be an independent, appropriately resourced body for each form of regulation in each jurisdiction.

The best practice standards represent a more ambitious target for each state and territory. Many of these criteria go beyond previous national agreements, or apply previously agreed principles to their fullest extent. It is important to highlight that best practice does not mean applying the highest possible standard at any cost. Value for money is a fundamental principle of delivering best practice urban water services. All investments should be assessed for their benefits relative to their cost – including their prudence and efficiency – as well as their impact on customers’ bills, before being signed off by regulators or implemented by utilities.

Figure 11: Different forms of urban water regulation

Function	Economic & Pricing 	Environmental 	Health 
Aim	Promote effective competition where possible and encourage efficiency	Mitigate the impact of water and wastewater collection, conveyance and treatment on the environment	Mitigate the risk of the provision of unsafe drinking water (and associated human health implications)
Involves	<ul style="list-style-type: none"> ■ Setting prices that reflect the efficient costs of water service provision ■ Aligning water providers' incentives with those of customers ■ Licensing and monitoring suppliers' compliance ■ Overseeing competition 	<ul style="list-style-type: none"> ■ Establishing monitoring & enforcing discharge standards ■ Regulating aspects of sewage treatment & recycled water schemes ■ Overseeing management of odours and bio-solids 	<ul style="list-style-type: none"> ■ Establishing monitoring & enforcing water and recycled water quality standards ■ Promoting public awareness of water quality issues ■ Incident management & emergency response

Source: Frontier Economics and Arup (2017)⁷⁰

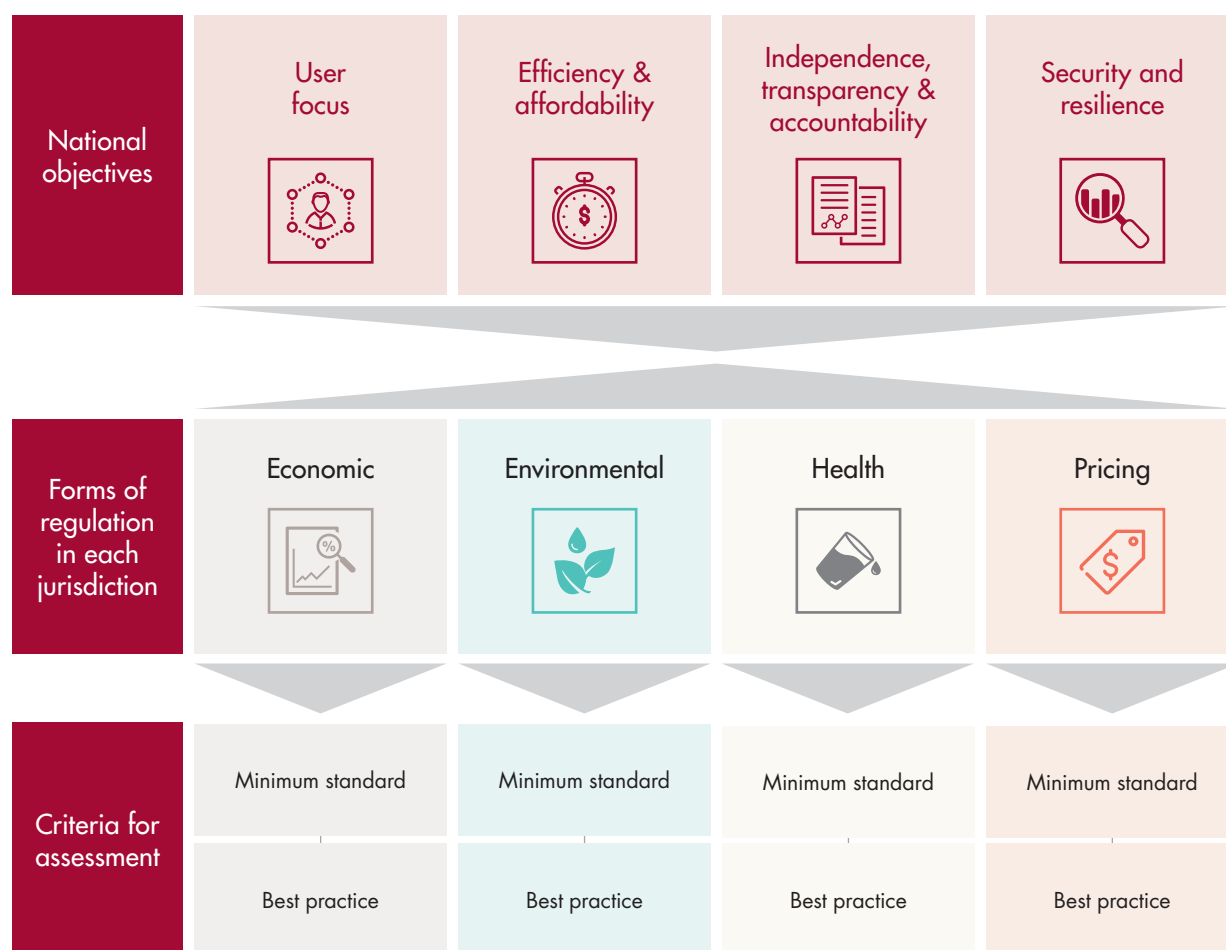
Figure 12 illustrates how national objectives can be applied to each form of regulation in each state and territory, and how these have been used to develop minimum and best practice criteria for benchmarking of each jurisdiction's current regulatory settings. A summarised list of minimum and best practice criteria can be found at **Appendix B**.

Economic regulation and pricing require different assessments

This paper has separated economic regulation and pricing. While these are intrinsically tied in practice, this theoretical separation allows for a more targeted review of the role price setting functions play in each jurisdiction. Specifically, it provides for a clearer assessment of how pricing reflects costs from each other form of regulation – economic, environmental and health – in determining user charges in each state and territory.

The minimum standard has also been set in a slightly different way for pricing compared with other forms of regulation. That is because the NWI and NWI Pricing Principles have provided a commonly-accepted, previously agreed standard by which jurisdictions should assess their pricing frameworks. On this basis, there was no need to develop a broader set of minimum standard criteria – these NWI principles provide the appropriate benchmark for this assessment. As with other forms of regulation, the best practice standards for pricing reflect more ambitious stretch targets – beyond the scope of the NWI principles.

Figure 12: Applying national objectives across forms of regulation



Source: Infrastructure Australia

4.2 The merits and limitations of cross-jurisdictional assessments

Leaders in regulatory reform can provide lessons for others

Australia's federal structure and diverse geography has in some ways created piecemeal reform progress in the urban water sector. Understandably, each jurisdiction has typically focused almost exclusively on their own urban water networks, creating separate legislative and regulatory frameworks.

As stated in the *Australian Infrastructure Plan*, there is a need for strong, independent leadership in the urban water sector. Part of this role is to provide ongoing monitoring and feedback to states on their urban water networks and the regulatory frameworks that oversee them, including an assessment of their progress against key outcomes – as established by the NWI and beyond.

In the absence of an independent national body overseeing urban water, there is a risk of reform efforts stalling or even back-sliding. The structure of the sector, with a high

degree of government ownership and oversight, means that many states and territories lack the independence or incentive to evaluate themselves honestly and identify important ongoing reforms.

Some states have forged ahead with user-focused, efficiency-enhancing reforms. Some of these have been driven through various rounds of national reform, including the NWI and COAG agreements. Other reform efforts have been triggered within jurisdictions by their own motivations for greater efficiency and service quality.

Calling out those jurisdictions that have advanced with reforming their regulatory structures is important for more than simple recognition of their efforts. Celebrating these successes can provide practical guidance by identifying what has worked, barriers to reform, and the benefits these reforms have delivered for utilities and customers alike. These lessons can provide vital guidance for those states that may be further from best practice in each form of regulation, and can establish links across jurisdictional borders to advance important reforms in line with nationally consistent standards.

This assessment represents a snapshot of the state of urban water reform

This assessment provides a simplified summary of complex regulatory frameworks and pricing processes. This approach enables these regulatory assessments to be easily compared across jurisdictions, and to a wide audience. The assessment aims to overcome a lack of clarity and transparency across many jurisdictions, which limits access to information on the urban water sector's governance arrangements, regulatory approaches and instruments, and decision-making processes.

However, this form of summary is a blunt tool. This assessment provides a snapshot of the performance of current frameworks with a high-level rationale for each assessment. Also, over time, what constitutes a minimum or best practice standard should evolve in line with community expectations. How each jurisdiction's regulators and service providers work to achieve these standards should also evolve over time.

Infrastructure Australia welcomes debate on these assessments

This analysis has been informed by separate research reports by Frontier Economics for economic, environmental and health regulation,⁷¹ and Aither for pricing.⁷² Each report provides detailed technical advice on the specific regulatory and pricing policy frameworks in each jurisdiction, and how these fare against common criteria. Infrastructure Australia has also undertaken a range of consultation and sought peer reviews from key stakeholders.

This paper has been informed by these different assessments and perspectives, but ultimately reflects the independent views of Infrastructure Australia. This analysis is inherently subjective. It is likely that some assessments will be disputed. Infrastructure Australia welcomes this debate as a way of driving common understanding between governments on the current state of urban water markets, and setting a pathway for future reforms.

In part, Infrastructure Australia's assessment has been constrained by a lack of publicly available, transparent information on urban water, resulting in an incomplete view of regulation and governance in many states and territories. We encourage jurisdictions to increase the transparency of their arrangements and processes to show progress against the minimum and best practice criteria of assessment. Fuller access to information can only benefit urban water policy-makers, regulators, service providers and ultimately customers across all jurisdictions.

4.3 A snapshot of urban water regulation across the country

An overview of IA's assessment of urban water regulation

The following tables provide a summary of how each state and territory's regulatory frameworks compare to minimum and best practice standards. It is important to note that the benchmarking in this chapter is an assessment of each jurisdiction's regulatory and governance frameworks against commonly-accepted criteria. It is **not** an assessment of the performance of the people and agencies in each state and territory, including government departments, regulators and utilities.

This assessment should also **not** be seen as a measurement of service quality outcomes. An amber or red for health regulation does not mean that water services are exposing communities to health risks, nor does an amber or red for environmental regulation mean that local habitats are at risk.

The traffic light indicators can broadly be interpreted as a summary of assessment against the set of minimum and best practice indicators outlined in this chapter. Each colour can be read as follows:





- **Green:** regulatory and governance frameworks meet the vast majority of criteria, most of the time
- **Amber:** regulatory and governance frameworks meet many of the criteria, but does not meet some important elements, and may lack full coverage and consistency across the jurisdiction
- **Red:** Many of the elements of the criteria are not being met, including major gaps in coverage or application of standards.







4.4 Economic regulation

The role of economic regulation in urban water

Economic regulation aims to protect the long-term interests of customers and the community by promoting effective competition where possible, or otherwise to reproduce the disciplines of competition by encouraging efficiency and innovation in service and cost performance over time. This ensures that monopoly businesses do not earn monopoly profits or provide sub-standard services while ensuring that they are able to recover the efficient costs of operating and maintaining their networks. This is particularly important to protect vulnerable, low income households from bill increases.

Traffic light summary: Minimum standard regulation								
	NSW	VIC	QLD	SA	WA	TAS	ACT	NT
 Economic	<div> <div></div> Metro <div></div> Regional </div>	<div><div></div></div>	<div> <div></div> Metro <div></div> Regional </div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
 Environmental	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
 Health	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
 Pricing	<div> <div></div> Metro <div></div> Regional </div>	<div><div></div></div>	<div> <div></div> Metro <div></div> Regional </div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>

Source: Infrastructure Australia analysis of Aither (2017)⁷³ and Frontier Economics and Arup (2017)⁷⁴

Traffic light summary: Best practice regulation								
	NSW	VIC	QLD	SA	WA	TAS	ACT	NT
 Economic	<div> <div></div> Metro <div></div> Regional </div>	<div><div></div></div>	<div> <div></div> Metro <div></div> Regional </div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
 Environmental	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
 Health	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>
 Pricing	<div> <div></div> Metro <div></div> Regional </div>	<div><div></div></div>	<div> <div></div> Metro <div></div> Regional </div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>

Source: Infrastructure Australia analysis of Aither (2017) and Frontier Economics and Arup (2017)

Well-developed and independent economic regulatory frameworks balance the interests of investors, suppliers and the community. Effective economic regulation protects investors and their investments from arbitrary policy making and provides certainty to investors by addressing regulatory risk. For utilities, economic regulations provide assurance of a fair playing field between existing and new suppliers, and confidence that they will be able to recoup the costs incurred through reasonable expenditure. For users, economic regulators

should provide confidence that market rules will be enforced, that they will be protected from unreasonable price rises, and that decisions will work in their best interests over the long term.

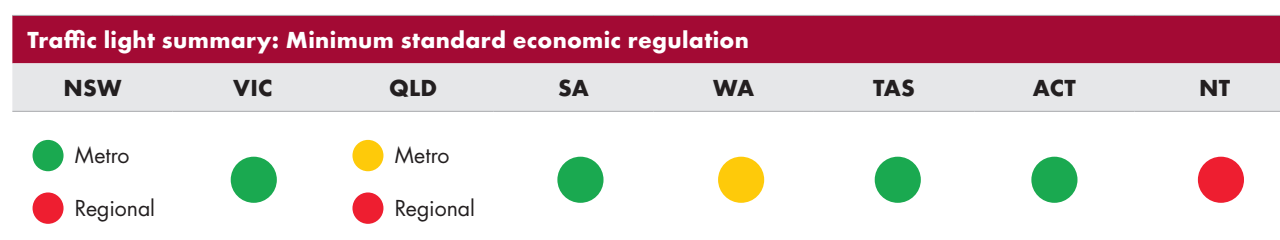
In the context of urban water, economic regulatory functions typically entail:

- oversight of the service levels provided by monopoly suppliers

- ensuring costs incurred by utilities for capital investments, operations and maintenance are prudent and efficient
- licensing of suppliers as a means of monitoring and enforcing compliance with these service levels and prices
- overseeing effective competition in contestable elements of these industries
- promoting greater competition wherever possible.

At the state and local government level, governments and economic regulators set rules in accordance with their own policies, with varying degrees of alignment with national objectives and principles. This means that the extent of coverage of economic regulation varies considerably across Australia – particularly in regional areas – where water services are provided and regulated by local councils (for example, New South Wales and Queensland).

4.4.1 Assessment against minimum standards



Source: Infrastructure Australia analysis of Frontier Economics and Arup (2017)

Most states are meeting minimum economic standards in metropolitan areas

As indicated by the above traffic light assessment, jurisdictions' performance against minimum economic regulation standards is mixed. Many states and territories are meeting or exceeding key elements, with appropriately resourced, independent economic regulators operating under their own Acts. However, as discussed below, in some states the frameworks lack sufficient clarity of the respective regulator's role and powers, the regulators are not fully independent, or there is insufficient capacity for transparent reviews of decisions.

Of all jurisdictions, Victoria and Tasmania have the most genuinely independent and comprehensive regulatory frameworks. Their arrangements, enacted respectively by the Victorian Essential Services Commission (ESC) and Office of the Tasmanian Economic Regulator (OTTER), currently meet the vast majority of criteria for minimum standard regulation. Both frameworks are characterised by clarity of regulatory objectives, effective stakeholder engagement and transparent decision making. The difference between each state's population suggests that scale should not be a barrier to regulatory reform across other states and territories.

Both Victoria and Tasmania have previously amalgamated their utilities. In the 1980s and early 1990s the Victorian Government reduced the number of regional water utilities from 400 to 15, and further reduced this to 13 in 2005. In Tasmania, the state government rationalised 29 local water utilities into a single provider, TasWater between 2009 and 2013.

Aside from introducing greater scale of service delivery for urban water utilities, these amalgamations also helped to reduce the regulatory burden in each state. This has enabled these economic regulators to undertake more direct and ongoing communication with policy arms of the government and utilities, streamline monitoring and compliance processes, and – recently in Victoria – undertake wide-ranging reforms to economic and pricing regulatory frameworks.

NSW provides a clear example of the divide between metro and non-metro areas

The decision to split the assessment of NSW's economic regulatory framework into metropolitan and regional components is indicative of a broader geographical divide facing regulators across Australia. The framework in NSW provides scope for meeting – and exceeding – many of the criteria for minimum standard economic regulation in metropolitan areas. However, this framework is not applied to the same level across most regional areas, where many local water utilities are not subject to the same regulatory and governance conditions.

In many ways, NSW's IPART led the way in economic regulatory sophistication as an early mover through forward-thinking legislation put in place in 1992,⁷⁵ ahead of the broader program of micro-economic reforms following the *Hilmer Review* in 1993.⁷⁶ Under NSW legislation, IPART regulates declared government monopoly services. In practice, this has seen effective, independent regulation of metropolitan businesses such as Sydney Water, and bulk water suppliers such as WaterNSW (previously Sydney Catchment Authority and State Water Corporation).

2008 Independent inquiry into urban water in regional NSW

An independent review of NSW urban water in 2008 highlighted the regulatory issues facing the 105 (now 92) NSW regional utilities not regulated by IPART.⁷⁷ This report identified a series of challenges that are likely to require substantial investment to address. In particular, this inquiry identified a range of weaknesses in the non-mandatory *Best-Practice Management of Water Supply and Sewerage Guidelines*.⁷⁸ The independent inquiry set out a range of reform priorities that remain relevant today, including:

- **Improving regulation:** Utilities should be required to implement all relevant plans, guidelines and standards, complemented by an adequate reporting and monitoring framework overseen by a regulator with adequate enforcement powers.
- **Improving pricing:** Regulation should be strengthened to require utilities to establish prices in accordance with approved business plans and financial plans, approved by an independent body.
- **Improving organisational structures:** Options should be considered for formally structuring groups of local regional utilities.⁷⁹

This framework specifically excludes utilities in regional urban areas, where water services are typically provided by local councils.⁸⁰ For 92 local utilities in regional NSW, water supply functions are delivered under the *Local Government Act 1993*⁸¹ and IPART has no role in regulating their functions as monopoly service providers.

Consequently, governance, planning and institutional arrangements in regional areas have fallen behind metropolitan areas. The performance of these utilities varies greatly, and a lack of transparency prevents adequate benchmarking. Many regional areas have reported poor service quality, in part caused by inadequate planning and investment in new and existing assets.

The regulatory issues across regional areas should not detract from the performance of local water managers, many of whom deliver excellent services to their

communities – often with limited resources and oversight. The expertise of local managers is and should remain vital to providing water services safely and efficiently to regional customers. Many local areas hold unique characteristics that are best understood by local managers. However, the good performance of some local utilities under the existing framework should not preclude reform of the sector to deliver lasting improvements to benefit all regional water providers and customers alike.

Improvements are required across other states

Beyond regional NSW, the frameworks for economic regulation of urban water services across Queensland, the Northern Territory and – to a lesser extent – Western Australia require reform for these jurisdictions to meet minimum standards.

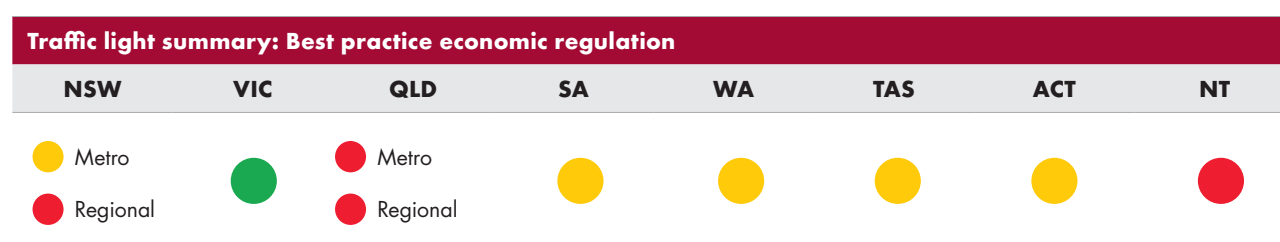


Established in 1997, the Queensland Competition Authority (QCA) undertook investigations and monitoring of matters referred to it by the Premier or Treasurer, while maintaining an oversight role. However, the QCA has no role in urban retail water and does not have genuinely independent, active regulatory powers in bulk water. While it does undertake periodic reviews at the request of the government, its authority to implement change is limited, and the bulk water price in South-East Queensland is set by the Queensland Government Cabinet. Effective economic

regulation across the rest of the state is lacking, since the QCA does not have a remit in regional areas.

In the Northern Territory, there is no effective independent economic regulation. The Utilities Commission regulates the energy sector, but its role in water and sewerage is confined mainly to licensing. The Minister effectively sets prices through a Water and Sewerage Pricing Order, and the Commission's role is to then monitor and enforce this order. The Commission does not undertake pricing reviews, nor does it play an active role in price setting.

4.4.2 Assessment against best practice standards



Source: Infrastructure Australia analysis of Frontier Economics and Arup (2017)

Most states are falling short of best practice economic regulation

While the majority of jurisdictions are meeting minimum economic regulation standards, an assessment against best practice criteria indicates that there remains room for improvement across the country. A number of jurisdictions have made significant strides to modernise the urban water sector over recent years, but there is still work to be done.

In particular, economic regulation could generally be sharpened to incentivise efficiency improvements, including through greater private sector participation. There have been some efforts to open metropolitan urban water services to increased competition for contracts. However, these arrangements could be broadened to provide greater incentives for innovation and investment in typically long-lived assets.

Privatisation of urban water assets remains a question for future state and territory governments. However, as outlined in more detail in **Chapter 5**, there are a series of no-regrets regulatory reforms that could unlock innovation and efficiency through greater private sector involvement in urban water in the near term.

This assessment is broadly aligned with the outcomes of a report commissioned by WSAA in 2014, which found that the current arrangements for economic regulation of the urban water sector have some significant shortcomings when compared to best practice. WSAA's position statement called for improvements to regulatory frameworks to better meet the long-term needs of customers, and for greater certainty and predictability in order to attract increased private sector investment in urban water.⁸²

Separation of roles is crucial for best practice regulation and efficient service delivery

Genuinely independent economic regulation is, in a large part, predicated on a separation of powers between owner, operator and regulator. Separation of policy, regulation and delivery functions was established as a core principle in 1994 by COAG and as a key requirement under the NWI, yet still remains an aspiration in many jurisdictions – most particularly, Queensland, regional NSW and the Northern Territory. Proposed legislative changes in Tasmania would also see that state shift further from best practice, with increased powers for political interference in decision-making.



A lack of clarity compromises accountability and can increase the cost of service delivery where uncertainty undermines the effectiveness of planning for urban water supply security. Consistent with WSAA's recommendations, national standards to specify the roles and responsibilities of water service providers, regulators, shareholders, water portfolio Ministers, water supply planners and local councils should be applied.⁸³ In order to act in the best long-term interest of users, institutional reforms should aim to achieve full separation of policy, regulation and service delivery.

Victoria provides a model for other jurisdictions to follow

The standout performer in economic regulation is Victoria, which has been assessed as meeting most of the best practice criteria. This assessment reflects the high degree of independence and transparency in the Victorian regulatory framework, which has been progressively strengthened to incentivise efficiency and customer engagement while maintaining relative autonomy of operational decision making for water service providers. The main shortcoming in Victoria is the lack of a third party access regime.

The ESC, Victoria's economic regulator, regulates all of the state's 19 water businesses by setting prices and performance standards. The ESC is a genuinely

independent regulator with clear, deterministic powers and objectives. Key strengths of the Victorian model include an explicit requirement for the ESC to collaborate with other bodies to ensure consistency and manage any conflicts, as well as being one of the only jurisdictions to include an independent appeals mechanism.

Following an extensive independent review of economic regulation, governance and efficiency in the Victorian water sector in 2015, the ESC released a new *Water Pricing Framework and Approach* paper.⁸⁴ This tied together an approach for Victorian water pricing following consultation with water service providers and other key stakeholders. The resulting Performance, Risk, Engagement, Management and Outcomes (PREMO) model, proposed for introduction in 2018, is expected to provide increased incentives for water businesses to improve efficiency, enhance customer engagement and deliver more user-focused outcomes.

New South Wales is achieving many elements of best practice economic regulation

In the metropolitan areas of NSW, where water service providers are regulated by IPART, economic regulation is largely effective in providing independent oversight of water service providers. IPART has clear objectives, powers to determine prices and can make recommendations to the Minister on licencing guidelines.

However, IPART's independent role could be strengthened. The regulatory framework could be moved towards best practice through further reform, including:

- periodic reviews of the IPART Act to ensure it remains fit-for-purpose
- clear direction on how IPART should manage conflicts and trade-offs between objectives
- introduction of a mechanism for merits review
- adoption of best practice consultation mechanisms to enhance transparency and accountability
- use of alternative risk-sharing mechanisms to more efficiently manage risk and reduce prices for customers
- adoption of clearly-specified incentive mechanisms to encourage service and cost improvements.

In regional areas of NSW, there is no effective economic regulation. There are significant opportunities to improve the framework that governs smaller regional utilities, in line with many of the recommendations of the 2008 inquiry into urban water supply in non-metropolitan NSW.⁸⁵

There is significant scope for improvement across other states

While other states have made some progress over recent years, their economic regulation frameworks remain some distance behind those in Victoria and metropolitan NSW. Other states could benefit from collaboration with regulators in Victoria and NSW to identify lessons for reform, and help to deliver future improvements to their own regulatory and governance frameworks.

In particular, other states should focus on working towards:

- ensuring economic regulation is genuinely independent
- ensuring economic regulators have price determination powers
- best practice customer-led consultation processes
- clearly prioritised legislative objectives to guide regulatory decision making
- service and cost improvements to deliver most customer-focused outcomes
- use of efficient risk-sharing mechanisms
- merits review frameworks (only Victoria and the ACT have this at present)
- formal access regimes to provide a framework for competition (only NSW, Queensland and SA have access regimes).



4.5 Environmental regulation

The role of environmental regulation in urban water

Urban water services encompass the capture, treatment and delivery of water, the collection, treatment, and disposal of wastewater, and the management of stormwater and flooding. A number of aspects of these services impact on the environment including:

- the impacts of treated and untreated wastewater discharges on the receiving environment including waterways, groundwater and land from irrigation
- the impact of diffuse source pollution including stormwater
- odour and noise emissions primarily associated with treatment infrastructure
- the management of solid and other waste by-products of treatment processes.

Environmental regulation seeks to manage these potential impacts and typically encompasses:

- monitoring the health of receiving waterways, and enforcing associated discharge licence conditions and standards for sewage treatment plants
- the establishment of guidelines for the management of stormwater
- monitoring the management of chemicals used in drinking water, wastewater and recycled water schemes
- establishing and managing approval processes for infrastructure work
- overseeing the management and monitoring of odours, noise, waste and bio-solids from water sector processes.

A growing emphasis on the application of a whole-of-water cycle approach to managing the impact of the urban water cycle on the environment is occurring with an integrated water cycle management program and 'catchment to tap' protection. This can incorporate environmental flow requirements to meet the needs of the environment for biodiversity production.



4.5.1 Assessment against minimum standards

Traffic light summary: Minimum standard environmental regulation							
NSW	VIC	QLD	SA	WA	TAS	ACT	NT
●	●	●	●	●	●	●	●

Source: Infrastructure Australia analysis of Frontier Economics and Arup (2017)

Performance is strong against minimum standard environmental criteria

All states have been assessed as meeting the majority of key elements of minimum standard environmental regulation. While the specific models differ across the country, each jurisdiction has an appropriately resourced, independent agency charged with regulating environmental standards, which is subject to objectives enshrined in legislation.

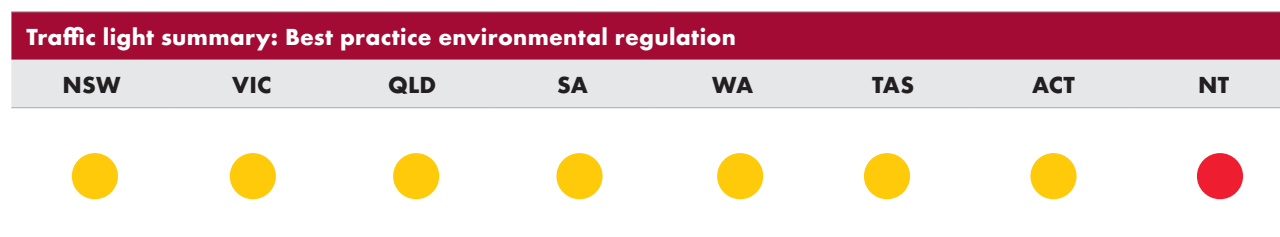
Environmental standards have broadly risen over recent decades, in line with increased community awareness and preferences concerning environmental issues. This evolution has largely been appropriate, and each jurisdiction has generally succeeded in protecting environments through monitoring and control mechanisms.

There are some issues with conflicting objectives and integration across forms of regulation

Regulating environmental outcomes for water separately from other functions provides clear advantages through increased independence of decision making and clarity of objectives. However, this approach also comes with risks and obstacles.

The major challenge for environmental regulators is how to integrate their role with other regulators, and how to manage conflicting objectives as they emerge. At present, environmental regulators in most jurisdictions undertake little more than ad hoc consultation and collaboration with other regulators and water service providers. Environmental regulators could do more to anticipate and resolve any conflicting objectives before they emerge, and to ensure their functions integrate efficiently across other forms of regulation.

4.5.2 Assessment against best practice standards



Source: Infrastructure Australia analysis of Frontier Economics and Arup (2017)

Environmental regulation is generally adequate but falls short of best practice

Most jurisdictions have been assessed as meeting some best practice environmental criteria some of the time. There is room for improvement across all states in order to improve efficiency, transparency and collaboration. Improvements are required to help align regulatory objectives with customers' interests – most particularly ensuring that efficiency and affordability are front of mind for regulators and service providers alike.

There is insufficient integration of environmental regulation with the work of economic and health regulators. Collaboration between regulators is largely unstructured and inconsistent, even where regulatory objectives are broadly similar or overlapping between functions. This reduces efficiency for regulators and businesses alike, and ultimately drives up costs for water customers.

For the Northern Territory, environmental regulation has been assessed as some distance off best practice. This is because the NT's regulatory framework lacks holistic deterministic powers, with regulatory responsibility across Acts, departments and ministerial portfolios. This impacts the transparency of the NT system, meaning it is not clear whether all environmental regulations are applied or subject to appropriate compliance.

Greater focus on efficiency and affordability is required across all jurisdictions

Environmental regulators have broadly succeeded in raising standards over time, in line with the rising expectations of the community. As best practice moves, there is the potential for a growing gap between what environmental outcomes can be achieved and what communities are prepared to pay for. Advances in environmental regulation can come at significant cost to communities in existing areas, and can add substantially to the cost of new developments.

For this reason, best practice environmental regulation should not mean simply applying the highest service

standards available. It is important that regulatory frameworks remain in touch with community expectations. Value for money, efficiency, and the community's willingness to pay must be critical components of a best practice regulatory framework.

There is scope for all regulators to improve their frameworks to raise efficiency and affordability. Generally, regulators do not consult or seek feedback on costs, nor do they routinely engage with stakeholders openly and transparently to ensure their frameworks align with community expectations. A move to risk-based environmental regulation and monitoring could help to reduce costs of compliance. Similarly, greater use of offsets and alternative mechanisms could provide service providers with greater flexibility to meet agreed environmental outcomes at lower cost to customers.



4.6 Health regulation

Summary of the role of health regulation in urban water

Water plays a vital role in sustaining public health. Drinking, washing, cleaning and wastewater services are integral to supporting Australians' way of life. However, issues in delivering these services safely could pose varying public health risks through a range of potential man-made and naturally occurring microbiological and chemical factors.

Regulation of the quality of urban water in Australia is governed by a complex set of regulatory and non-regulatory arrangements. States and territories have a constitutional responsibility for the management of water resources, however requirements for maintaining urban water quality are developed and administered by all three levels of government.

Regulation of public health outcomes for urban water networks can broadly be split into two main forms: drinking water and recycled water. Drinking water quality regulation typically encompasses:

- establishing, monitoring and enforcing compliance with drinking water standards
- promoting public awareness of drinking water quality issues
- defining roles in incident management and emergency response
- defining process steps and treatment technologies including their validation and verification.

Recycled water regulation focuses on:

- establishing, monitoring and enforcing compliance with recycled water standards
- identifying hazards to the health outcomes of recycled water
- designing and establishing processes to screen and treat hazards
- preventing hazards from entering recycled water where appropriate, or reducing exposure to safe levels.









Urban water health outcomes in Australia are regulated by each state and territory government, with guidelines established at a national level for drinking water and

recycled water. The *Australian Drinking Water Guidelines* (ADWGs) are the primary resource for potable water, while the *Australian Guidelines for Water Recycling* (AGWRs) aims to establish a risk-based system for managing recycled water. Each of these sets of guidelines, while nationally agreed, are applied differently within each jurisdiction's regulatory and legislative frameworks.

This benchmarking assesses the regulatory and institutional settings that govern performance and protect customers over the long term. It **does not** reflect water quality, compliance with the ADWGs and AGWRs, or broader health outcomes in each state and territory. In general, water quality outcomes across Australia are very good. However, as illustrated in an earlier report commissioned by Infrastructure Australia, there remain scope for improving oversight of health outcomes, particularly in regional areas.⁸⁶

Where jurisdictions have received an amber or red rating, this **should not** be interpreted as an assessment that water services are unsafe, or communities face particular health risks. Rather, this should be seen as a signal for states and territories to refine their governance and oversight to best protect users into the future.

4.6.1 Assessment against minimum standards

Traffic light summary: Minimum standard health regulation							
NSW	VIC	QLD	SA	WA	TAS	ACT	NT
							

Source: *Infrastructure Australia analysis of Frontier Economics and Arup (2017)*

Performance against minimum standard health regulation is generally good

The majority of states and territories have been assessed as meeting base standard health regulation. Both the ADWGs and AGWRs are generally specified in jurisdictional legislation, with compliance against set objectives undertaken through adequately resourced independent agencies.

The exceptions to this are Western Australia and the Northern Territory, where there is no clear health agency responsible for monitoring and enforcing performance against drinking water standards. Regulation of recycled water in these jurisdictions is also less stringent than in other parts of the country. Despite these relative

limitations of regulatory oversight, it is important to note the ongoing efforts of the respective utilities. Both WA Water Corporation⁸⁷ and NT Power and Water Corporation⁸⁸ report strong performance against health outcomes.

In general, regulation of drinking water standards is more strongly defined and enforced than for recycled water. Some jurisdictions do not require the AGWRs be complied with – rather that these guidelines simply be a reference and guidance document. While this disparity between forms of health regulation may relate to the level of health risks of drinking water, as opposed to recycled water, the AGWRs represent an important health standard that should be enforced.



Gaps in health regulation in regional and remote communities must be fixed

Health regulation is not being adequately enforced in many parts of regional and remote Australia, including a large number of predominantly Indigenous communities. In some cases, this may be because the local water scheme has been deemed to pose relatively low risks to public health. In other cases, regulation is weak or virtually non-existent because of the difficulties and costs of supplying water services to adequate standards in these areas.

Reasonable protection from public health risks through urban water networks should be afforded to all Australians. There are significant additional hurdles for water service providers and regulators in regional and remote areas, including issues of scale, cost, access, extreme conditions and occupational health and safety. However, these should not preclude sustained efforts to improve service quality, reduce the disparity of service between metropolitan and remote areas, and support broader efforts to raise the standard of living.

Improving drinking water quality in remote and Indigenous communities

Water contamination is an ongoing consideration for regulators, policy makers and suppliers across the country. While progress has been made in providing consistently safe and reliable services across all jurisdictions, in particular a number of remote and Indigenous communities remain vulnerable to public health risks affecting water sources given their isolation, scale and unique local environments.

A 2015 Western Australian Auditor General's highlighted this issue, and provided evidence that fourteen WA communities recorded nitrates above safe levels for bottle-fed babies. Two communities, Cosmo Newberry and Patjarr, recorded nitrate levels of over 100 milligrams per litre – an unsafe dose for children and adults.⁹⁰ Over the course of two years, *Escherichia coli* or *Naegleria* microbes were detected across a number of communities.⁹¹

To date no illness has been directly attributed to drinking water with elevated levels of nitrates or uranium in Western Australia. However, the WA Auditor General and the Western Desert Kidney Project⁹² (run through the University of Western Australia), have raised concerns about links between excessive uranium and nitrate consumption and a heightened risk of serious illness.⁹³









Some contamination of nitrates above safe levels has also been detected in parts of the Northern Territory in the past, but NT Power and Water Corporation report that these issues have been addressed. Other states and territories also face ongoing risks to their urban water systems that need to be monitored and actively managed.

All Australians should be able to access safe drinking water, regardless of where they live. Communities should not be dependent on bottled water for extended periods. Viable options for monitoring and addressing issues in remote areas should be facilitated by water providers, governments and regulators. Solutions should be provided on a case-by-case basis and in consultation with communities.

These issues were highlighted in the *Australian Infrastructure Plan*. **Recommendation 4.7** called for drinking water in all regional communities to meet the minimum standards in the ADWGs. This paper has assessed the regulatory frameworks overseeing the delivery of regional urban water, but has not undertaken a more detailed assessment of performance and outcomes

in regional communities. As proposed in the Plan, this should be undertaken by each state and territory government through ‘an independent audit of the performance, financial viability and capacity constraints of local councils [and other relevant service providers] to identify areas of highest risk’.⁸⁹

4.6.2 Assessment against best practice standards

Traffic light summary: Best practice health regulation							
NSW	VIC	QLD	SA	WA	TAS	ACT	NT
							

Source: *Infrastructure Australia analysis of Frontier Economics and Arup (2017)*

No jurisdiction meets best practice health regulation

While the majority of states and territories are meeting best practice regulations in part, no jurisdiction is fully meeting the criteria for health regulation. Although the ADWGs and AGWRs are included in relevant legislation across most jurisdictions, there is a lack of full and complete legislative adoption of these guidelines. As with the assessment of minimum standard health regulation, states and territories have better enshrined standards for drinking water than those for recycled water in their regulatory systems.

This regulatory shortfall is most apparent in many sections of regional Australia, where urban water service providers are encouraged or incentivised to comply with these guidelines, but compliance is not transparently monitored or enforced. This lack of full coverage limits the benefits for many Australian communities of an effective risk-based framework across most of the urban water cycle.

Some states allow exemptions for compliance with national guidelines in regional areas or smaller utilities. This is compounded by a lack of independently audited compliance across some jurisdictions, with variations in how guidelines are expected to be applied across utilities. These exemptions and variations undermine the intent and effectiveness of nationally consistent health frameworks, and could expose some Australians to unacceptable public health risks.

Governance accountability could be improved across the country

Structural reforms could improve the transparency and accountability of health regulation for urban water across most jurisdictions. The line of accountability for decision-making throughout the governance structure – between the Minister, relevant departments, regulators and service providers – should be clear. The objectives and responsibilities of each entity should be well-defined and any overlaps or conflicts minimised.

For example, the clarity and independence of the regulatory structure for urban water health in Western Australia could be improved. The Health Department has some involvement in health regulation of urban water, but relies on a Memorandum of Understanding with the service provider, Water Corporation, to ensure services are provided in accordance with health standards. This arrangement could be strengthened by providing a stronger and more independent regulatory role for the health department, with greater clarity provided in legislation on the formal responsibilities for each entity to ensure that services are delivered in line with the ADWGs and broader public health outcomes.

Similarly, in the Northern Territory, several government agencies share responsibility for the regulating the public health outcomes of urban water, including the Department of Health. However, it is the supplier, Power and Water Corporation, which holds primary responsibility for delivering services in line with health standards, and formal regulation of public health is ultimately undertaken through the Minister for Environment and Natural Resources. This means that the line of responsibility for maintaining public health through urban water lacks clarity and accountability.

New Zealand inquiry into health regulation in regional water utilities

In August 2016, more than 4,500 residents of the community of Havelock North in New Zealand were infected with gastrointestinal illness after drinking untreated, contaminated groundwater. The majority of the affected community experienced nausea, vomiting and diarrhoea, but long-term effects may be more severe.⁹⁵

As a result of the outbreak, the New Zealand government launched an inquiry into the cause of the contamination, whether relevant parties complied with their obligations and how to prevent future such occurrences. Initial reports suggest that livestock faeces containing campylobacter bacteria entered the groundwater supply and caused the infection.

This event provides clear evidence of the potential scale of cost to the community from a failure to uphold drinking water standards – despite New Zealand’s comprehensive national drinking water standards. Public health officials and regulators should be vigilant in monitoring compliance with health standards, and management of public water sources.

While the departments and service providers responsible for delivering safe, secure and efficient water services perform a difficult task across much of the territory, their task could be made easier through a clearer and more accountable regulatory framework. The existing Memorandum of Understanding between the Department of Health and Power and Water Corporation should be defined in legislation, along with a formal commitment to the ADWGs and AGWRs, as is the case across most other jurisdictions.

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4.7 Pricing

Summary of the role of pricing in urban water

Pricing reflects a synthesis of other forms of regulation in the urban water sector, and plays an important role in determining the performance of urban water businesses. Pricing regulators seek to balance the financial viability needs of water businesses with those of water users and taxpayers by determining how much businesses can charge for the services they provide.

The natural monopoly characteristics of large segments of the urban water supply chain require independent economic regulation to ensure that costs are transparent, prudent and efficient and that customers do not face monopoly

water charges. Different types of regulation interact when determining efficient and prudent costs. Economic regulators typically set prices that provide service providers with a reasonable opportunity to recover the efficient and prudent costs of providing urban water services.

As noted by IPART in its final report on Sydney Water’s maximum prices for 2016 to 2020:

We have set prices based on [an]... assessment of the efficient costs Sydney Water will incur in meeting all of its service and performance standards. This includes its environmental obligations and licence requirement.⁹⁶

When there is abundant supply, new supply augmentation is calculated by population growth forecasts and prices are set over a long run period. However, at other times, such as during the Millennium Drought, pricing frameworks have insufficiently responded to a lack of supply, resulting in regulated, long-term prices that did not reflect water’s true value or provide a signal to customers.

Compounding this effect were the major urban investments made directly by governments. While governments placed downward pressure on bills, they simultaneously invested in infrastructure at historic highs. In 2011, the NWC found that:

The prudence of these major decisions was outside the purview of economic regulators. Governments directly subsidised many investments, meaning that water customers did not face the full costs of water services. Some governments reduced the required rate of return on assets and specified maximum price increases.⁹⁷











This is contrary to NWI outcomes for transparency and full cost recovery. Any decision to exclude investment decisions from prudence and efficiency tests undertaken by the economic regulator clearly works against the best long-term interests of customers. Utilities, regulators and governments should be focused on improving cost

recovery to improve their own financial sustainability, reduce the burden they place on the broader tax base and deliver improvements against key affordability and efficiency outcomes.

Water pricing also plays an important demand management role. The NWC found that consumption-

based pricing has contributed to a consistent pattern of reduced water consumption that was particularly evident in the 1990s.⁹⁸ By managing demand, water prices can delay or avoid the need for large investments in supply augmentation.

4.7.1 Assessment against minimum standards

Traffic light summary: Minimum standard pricing							
NSW	VIC	QLD	SA	WA	TAS	ACT	NT
 Metro  Regional		 Metro  Regional					

Source: *Infrastructure Australia analysis of Aither (2017)*

Progress has been made against national agreements but challenges remain

Generally, states have made progress in adopting a large number of agreed actions from the COAG Reform Framework and NWI Pricing Principles, included consumption-based tariffs and full cost recovery. A number of states are meeting most or all of the minimum standard pricing criteria, including Victoria, South Australia, the ACT, and metropolitan NSW. Metropolitan areas are the standout performers and have enjoyed the largest and most beneficial pricing-based reforms. In Tasmania, reforms are already in place to transition to full cost recovery, which should be achieved by 2020 and which would raise their settings to meet minimum standards.

Despite progress, there are significant areas for improvement. The implementation of pricing policies under the NWI has been inconsistent across jurisdictions and in some cases, inconsistent with the intent of the NWI. The Productivity Commission⁹⁹ and the NWC¹⁰⁰ have argued that the NWI Pricing Principles provide too much flexibility in implementation and do not necessarily support principles of economically efficient pricing. Despite being agreed over two decades ago under the COAG Reform Framework, the fundamental principle of full cost recovery for urban water pricing is not being met universally across the urban water sector.

Our assessment of performance against minimum standard pricing criteria is hindered by insufficient publicly available information. A lack of transparency in Western Australia, regional NSW, the Northern Territory and South-East Queensland means it is not possible to accurately determine whether key criteria are being met, including full cost recovery.

Opaque pricing frustrates full cost recovery, especially in regional areas

Water price reviews and findings should be robust and public. Many jurisdictions' regional pricing arrangements are opaque, and may not be operating on a commercially-viable basis. In some instances, recovery rates could be inflated, and reporting on financial performance may be being inappropriately conducted.

Customers should be able to see how prices are set and whether full cost recovery is being achieved. Opaque pricing arrangements frustrate efforts to monitor progress towards upper bound pricing – the level at which a water business make a positive rate of return while not recovering more than the costs of operations, maintenance, depreciation, taxes, capital and administration.

The financial performance of regional utilities is highly variable and it appears that little progress has been made to adopt basic NWI recommendations. In 2011, The Productivity Commission¹⁰¹ found that a significant number of regional water utilities in New South Wales and Queensland are not fully recovering costs. In New South Wales, the Department of Primary Industries Water has reported that all local councils in New South Wales are achieving full cost recovery, however the state-wide median economic real rate of return of 2.3% suggests a return on capital consistent with a WACC may not be in place for all councils.¹⁰²

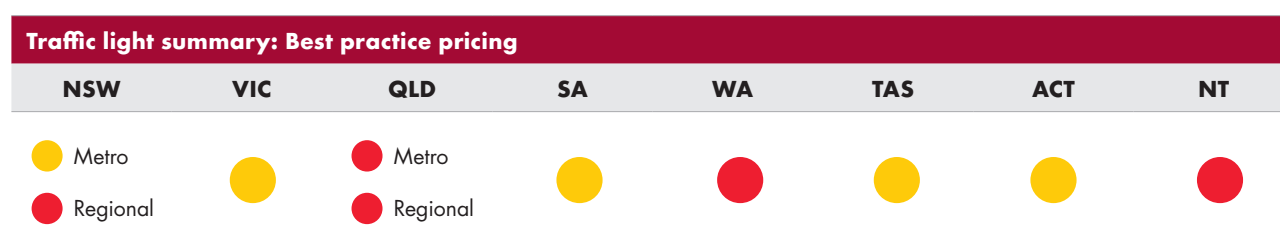
In Western Australia, where the government sets prices, there is insufficient evidence to determine whether prices are set to meet full cost recovery. In 2013, the Economic Regulation Authority of Western Australia (ERA) stated that 'charges in place at the time were significantly below cost-reflective charges'.¹⁰³ The ERA committed to gradually increase charges until 2016-17, by which

time they were expected to be cost-reflective. A lack of available public information means it is unclear whether this has occurred.

Similarly, performance against the minimum standard in Queensland varies. Prices for bulk water in South-East Queensland are moving to full cost recovery. However, the QCA's price monitoring role has been wound back,

meaning there is insufficient evidence to determine whether distributor-retailers are achieving or exceeding full cost recovery. Full cost recovery for retail water in Queensland's regional areas is also mixed since councils still provide water services and set prices. However, a lack of transparency around these processes means there is insufficient information to assess whether full cost recovery is being achieved in these areas.

4.7.2 Assessment against best practice standards



Source: Infrastructure Australia analysis of Aither (2017)

Best practice pricing standards represent a stretch target for jurisdictions

A number of states and territories have well-developed regulatory frameworks for urban water pricing. However, none meet best practice across all criteria.

This is understandable, since the best practice criteria for pricing go beyond the elements agreed to by jurisdictions under the COAG Water Reform Framework and the NWI Pricing Principles, and have very specific requirements (outlined at **Appendix B**). The best practice standard includes a range of elements over and above these previous agreements, including but not limited to:

- implementing a transparent cost sharing framework to allocate costs between government and customers that can be applied consistently
- moving away from renewals annuities
- managing the impact of rising water bills on low income households through mechanisms other than broad-based water price reductions
- restraining government intervention in price setting process
- setting costs linked to service standards with no arbitrary exclusion of costs
- moving away from inclining block tariffs
- individual metering of new multi-unit dwellings.

Institutional changes could help to advance these reforms in most jurisdictions. In particular, a key issue across a number of states and territories is the lack of an independent body with the authority to determine prices. In many jurisdictions, this role is undertaken by each government through their respective Minister or Cabinet. Reforming these arrangements would help to improve the independence, transparency and accountability of price-setting. Specific arrangements across the country include:

- In the Northern Territory, the government offers concessions to customers and operating subsidies to the primary utility, Power and Water Corporation, to account for revenue shortfalls due the provision of services to regional and remote areas.
- In South-East Queensland, the economic regulator's previous oversight role has been diminished, meaning the QCA plays only an advisory role in bulk water pricing.
- In Western Australia, the ERA's assessments are also predominantly advisory.
- In regional areas of Queensland and NSW, pricing determination remains a function of the local utilities.



Jurisdictions' performance against transparency measures is mixed

Transparent cost-sharing frameworks are key to efficiently and affordably allocating costs between government and customers. Capital and operating costs should be tested for prudence and efficiency by independent regulators and all costs should be linked to clear service standards. Water prices should be calculated in a transparent manner, with customer input and a clear delineation of trade-offs between costs and services standards.

The best practice standard for testing costs is being achieved where economic regulators have a role in price or revenue setting, including metropolitan NSW, Victoria, the ACT, South Australia, and Tasmania. Most metropolitan water providers provide at least some transparency through public reports and pricing reviews.

Western Australia, Queensland, regional NSW and the Northern Territory are further off the pace. In these areas, costs are not being transparently disclosed, and cost sharing between governments and users is not made clear. In many cases, there are no clear and consultative service standards and there do not appear to be any frameworks or requirements for engagement with customers.

Capital and operating costs incurred by local councils for retail urban water are not subject to independent tests for prudence and efficiency. To meet best practice standards, councils should prepare a business plan which includes a review of customer demand, forecast growth requirements and anticipated service standards. Currently, Queensland is partially meeting the standard for cost transparency. However, there is no independent testing of costs incurred by the five distributor-retailers and local councils.

It is not unusual for costs to be funded by taxpayers through a CSO, however the size of the subsidy is often not reported publicly. The costs of providing CSOs should be made clear and payments opened to full public scrutiny through government budgetary processes. This exposure can help to identify opportunities for improvements in efficiency and moving towards greater cost recovery, potentially reducing the costs of CSOs imposed on taxpayers over the long term.

Pricing concessions for vulnerable customers could be improved

Protection of customers is a vital component of urban water reform and progression. Under the best practice standard, there is an additional requirement over and above current commitments, to implement the *Australian Infrastructure Plan's* recommendation to manage the impact of rising water bills on low income households and other vulnerable customers through mechanisms other than broad-based water price reductions. The Productivity Commission came to a similar conclusion in relation to concessions for low income households.¹⁰⁴

Jurisdictions have a variety of disparate management systems which, at times, fail to address the needs of marginalised or vulnerable customers. Providing concessions on service charges, consumption charges and other fees distorts price signals and creates uncertainty. Hidden cross-subsidies mean that governments, utilities and ultimately customers are unclear about the degree of assistance provided, and the benefits of price signals as a means of demand management.

A more efficient pricing structure would see all customers face the full cost of service provision through their bills, thus providing a clearer price signal to promote more efficient water use. Rebates on the fixed component of water bills could be provided to vulnerable customers. Where further assistance is required, this could be provided through the broader welfare system so long as payments are transparent. This would drive more efficient use of water, and greater transparency of welfare provision.

Victoria's move to the PREMO framework provides an example for others

The proposed PREMO framework suggests that the price setting process should be used as a method of enhancing customer engagement and safeguarding user outcomes. Under this approach, water businesses' price submissions will be assessed and rated on the five PREMO elements: Performance, Risk, Engagement, Management and Outcomes. Based on these metrics, businesses will be rated as having leading, advanced, standard or basic levels of ambition, which will determine the business's allowable rate of return on investment. The better the rating, the higher the rate of return.

Under the framework, water businesses are incentivised to place customers' concerns at the centre of their pricing submission. Businesses will only be able to recover higher levels of return if they can demonstrate they are capable of catering to customers' needs. Submissions attracting a higher rating will need to demonstrate customer engagement, efficient management practices, adaptability and detailed self-examination. To ensure a desired rate of return, water business must engage with customers to understand their requirements, priorities and preferences so that their price submissions can reflect outcomes valued by customers.

This innovative approach recognises that businesses are better positioned than regulators to determine customer expectations. The PREMO framework has not yet been tested, and may require refinement to ensure settings such as the WACC are fair and efficient, or to reflect changes over time – such as greater private involvement in service delivery. However, it represents an important attempt to place the customers' needs at the heart of process, and is likely to provide lessons for other jurisdictions as they look to improve their own pricing frameworks.

4.8 Lessons across forms of urban water regulation

No jurisdiction is perfect, but reform has delivered significant benefits for customers

The benchmarking in this chapter shows that regulatory frameworks vary greatly across states and territories. This is to be expected, given each jurisdiction has developed separately over recent decades, and has faced different budgetary, political, operating and climactic pressures.

The standout performers are clearly those jurisdictions that have prioritised and progressed regulatory reform. The experience of Victoria over recent years, and metropolitan New South Wales before them, provide examples for other states to follow. These states have undoubtedly benefited from greater scale of population and water operations, providing increased capacity for the injection of competition and private participation to drive improvements in efficiency and service quality.

Many less populous jurisdictions, including South Australia, Tasmania and the Australian Capital Territory, have excelled in a number of facets of regulatory reform despite their scale. Reforms to make the regulatory frameworks more independent, transparent and accountable have helped to introduce greater competition and efficiency among water service providers. These reforms have also provided greater confidence to customers that services are being delivered safely, sustainably and affordably.

Despite the past successes of the urban water sector, no jurisdiction is meeting best practice across all forms of regulation. While reform has delivered benefits over recent decades, in more recent times there has been a loss of reform momentum across many jurisdictions. A renewed push for change against nationally consistent standards will be required to ensure the urban water sector is best prepared to tackle the challenges outlined in **Chapter 2**.



There is a clear divide between urban water regulation in metropolitan and regional areas

Across most states and territories, it is clear that regulation of regional utilities is inferior to that of their metropolitan counterparts. This disparity is due to many factors, including the challenges of scale, geography, availability of capital, attracting and retaining staff, and countless other local variables. For these reasons, it is unlikely that many urban water utilities in regional areas could ever match metropolitan areas for market sophistication.

However, regional Australians should not have to accept a lower standard of regulatory oversight and governance for their water utilities. Enhanced transparency and accountability in regional areas could help to improve efficiency, meaning lower customer bills or lower subsidies from the broader tax base. Reform could also provide greater confidence to regional customers that the guidelines for drinking water and recycled water are being applied to the same standard as other Australian communities. Reforms to the regional water sector should reflect the costs and potential benefits of reform.

Disconnection between forms of regulation means a worse deal for customers and taxpayers

There are clear benefits to separating forms of regulation in each state and territory. This approach allows greater specialisation of standard setting and compliance. Individual frameworks provide greater clarity for

both regulators and service providers, and enable the development of separate regulatory models for each component of service delivery.

However, the separation of regulatory functions also comes with some challenges. In many states and territories, urban water frameworks for economic, environmental, health and pricing functions have become disconnected from core user-focused objectives. Many utilities have struggled to balance competing priorities while keeping costs down. Rising operational and administrative hurdles for compliance, such as reporting requirements for each form of regulation across multiple government agencies, while well-intentioned, have become burdensome for many service providers.

Coordinated efforts are required between governments and regulators to streamline regulatory processes, provide greater scope for collaboration on overlapping objectives, and reduce conflicts wherever possible. These reforms should be guided by feedback from utilities, whose experience in complying with disparate regulatory frameworks will be invaluable for identifying potential improvements to these processes.

Regulatory disconnection and complexity has caused headaches for regulators and service providers alike – but the ultimate losers from these issues are users. While many households have no visibility of – and most probably very little direct interest in – the challenges of their jurisdiction’s regulatory structures, it is customers who bear the consequential burden of higher bills, lower service quality, or both.

Pathway for reform

Actions for the urban water sector

At a glance

- The urban water sector is due for a new round of reforms. Action is required for the urban water sector to be prepared for the challenges it faces over coming decades.
- This chapter provides recommendations that set a pathway for reform of Australia's urban water sector in three stages:
 1. **Establish a national urban water reform pathway:** Within 12 months, governments should agree on the need for a new national urban water reform plan and a set of clear national objectives for reform. An independent national urban water reform body should be set up to provide the strong national leadership required to advance urban water reforms. These should be incentivised through payments – over and above existing infrastructure investment allocations – to states and territories in return for action on reforms.
 2. **Deliver nationally consistent urban water reforms:** Over the next five years, governments should roll out a range of reforms, including refinements to regulation and governance in each state and territory, as well as improvements to long-term planning and pricing frameworks, and enhanced collaboration between regulators. Regional outcomes should be prioritised to ensure users outside major cities also benefit from progress in urban water delivery, and private participation should be encouraged where there is potential for it to improve services and reduce costs.
 3. **Consider further reforms over time:** Following delivery of these nationally consistent reforms, governments should consider further structural changes to urban water. Moving to a national regulator and privatising urban water assets could provide substantial benefits to users if implemented in the right way – but the sector should be reformed first.
- Reform should build on the work of the Productivity Commission's final inquiry report on *National Water Reform*. It will be essential to harness the momentum created through this inquiry, and transform this into committed actions to reform the urban water sector.



5.1 Now is the time for a renewed reform effort

The urban water sector is ripe for reform

As **Chapter 1** laid out, the momentum for reform has slowed after the success of previous efforts over the past 20 years. The COAG Reform Framework and the NWI largely served their purpose as catalysts for improving the efficiency, transparency and sophistication of the urban water sector. However, it is unlikely that these agreements will provide an appropriate platform for the further reforms required to address current and emerging challenges in the urban water sector.

There remains great enthusiasm and latent capacity within the urban water sector to drive improvements. In some cases, jurisdictions and service providers are undertaking unilateral efforts to progress reforms. The benefits of these improvements should be available across the country. Only a new national commitment to reform will be capable of delivering reforms of the breadth and scale required.

Reform is required to meet the challenges facing the sector

Our world is changing, bringing new challenges for Australia's infrastructure. **Chapter 2** established the challenges facing the urban water sector, including rapidly growing cities and towns, increasing climate volatility and changing customer expectations. Many of these are not new, but the confluence of these factors presents an unprecedented challenge. Unless action is taken, it is likely that customers will be forced to endure rising bills, a reduction in service quality, or both. Taxpayers too may

face rising payments for CSOs where user charges cannot cover the costs of water businesses.

It is essential that action is taken before the next major drought or another challenge which could prevent clear thinking on efficient, long-term solutions. The Millennium Drought brought many lessons for the sector, but there has not yet been a round of reforms through which to apply these lessons. A national reform effort could bring substantial benefits for how the sector manages not just hydrological risks, but how it manages a range of drivers of change across all forms of urban water service delivery.

The time for clear thinking and long-term planning is now. If we fail to act, the sector could again find itself in a situation where addressing short-term challenges takes precedence over long-term efficiency, affordability and resilience. Ultimately, customers and taxpayers would again have to foot the bill for this inaction. Given the broader pressures on household budgets and rising business costs, this could have serious impacts for the economy and Australians' quality of life.

No jurisdiction is perfect, but reform leaders can show the way

While Australia's federated system has its benefits and challenges, the disparate state of reform across jurisdictions brings significant opportunities for knowledge sharing that are not always fully utilised. The assessments of each jurisdiction's regulatory frameworks in **Chapters 3** and **4** provide one perspective on the state of reform across the country. While there may be some debate about where each jurisdiction is up to, and how they compare, there can be no doubt that there are opportunities for sharing lessons across state and territory borders.

Reform leaders have delivered substantial benefits for users and taxpayers. The more populous states of Victoria and New South Wales clearly lead the way on a number of fronts. While this may stem in part from each jurisdiction's relative scale, it is also true that their willingness to harness private sector involvement, and commit to improvements with the support of industry and the community has substantially contributed to their success. The key to unlocking reforms across other states and territories is to examine what has worked, what may have been less successful, and how these can be applied across the country in a way that maximises benefits for customers and taxpayers.

5.2 Reform can take many paths

National objectives can provide the basis for 'no-regrets' reforms

As stated in the *Australian Infrastructure Plan*, Australia needs a renewed national water reform agenda to ensure the water sector appropriately manages the challenges it faces and delivers the best outcomes for users. Policies and principles that will shape an urban water reform agenda should align with a set of agreed national objectives. These objectives can provide the basis for reform in each jurisdiction, offering a touchstone for decisions made by policy-makers, regulators and utilities.

These objectives can then provide the basis for a range of reforms. Many of these will bring 'no-regrets' improvements to efficiency and accountability that will deliver lasting benefits for users. In some cases, these reforms will be based on principles laid out in previous national agreements. As a result, industry and the community may be comfortable with an accelerated program for implementation.

Many of these reforms have standalone requirements and benefits, meaning they can be implemented in any order. For example, measures to improve accountability through more public reporting of performance need not wait for other efforts to implement a structured approach to long-term planning. Each reform will bring a jurisdiction closer to achieving the broader national objectives, and will be worthwhile in their own right.

A national reform agenda should provide some flexibility

Of course, in some cases, reforms may not be easy to implement. Many require changes to legislative, regulatory and operational frameworks that are often complex and deeply imbedded within industry practices. These complexities differ across each state and territory, so a one-size-fits-all approach will not provide an effective basis for reforms.

Crucially also, governments will need to build support for change in communities to establish trust and communicate the benefits of reform. These processes are likely to take time and sustained commitment by reform leaders. Similarly, national objectives should support local autonomy. Establishing consensus and agreement around a set of clear national objectives for the urban water sector does not mean there must be national consistency in every way. Instead, it provides a common framework for advancing reforms.

For a national reform agenda to be successful, it needs to respect the processes required in jurisdictions to advance reforms, and the autonomy of governments to advance those reforms in a way that best meets their needs. This approach is consistent with the advice of the Productivity Commission in its 2005 review of NCP, which highlighted the need for state and territory governments to retain flexibility in deciding how reforms were implemented in their respective jurisdictions.¹⁰⁵

Delivering water and wastewater services in each of Australia's cities and towns is a complex undertaking, with local conditions and community expectations rightly playing an important role in how each utility plans, operates its assets and engages with key stakeholders. A national reform agenda should harness this local expertise, rather than seek to override it. Respecting local autonomy will allow each jurisdiction and utility to own the changes they make, making them advocates for reform and ensuring they play a strong role in establishing and maintaining the support of local communities.

5.3 Establish a national urban water reform pathway

Australia needs a new national urban water reform plan

The benchmarking in **Chapter 4** shows that while there has been some progress against principles set out in previous national reform agreements, there remains scope for further progress in all states and territories. Reforms under the 2004 National Water Initiative have stalled, and even some reforms initiated under the 1994 COAG Reform Framework remain incomplete. More recently, there has been no explicit consideration of urban water reform or NWI principles in intergovernmental agreements covering Australian cities, and some jurisdictions have shown signs of backsliding on previous reform efforts.

Much has changed in the urban water sector since 2004, when the NWI was put in place, including:

- major cities have become much larger and more dense
- community expectations have risen
- risks from climate change have been heightened, with increasingly frequent extreme weather events

- best practice has shifted for service delivery, including more sophisticated water management technologies
- fiscal conditions have tightened for governments, increasing pressure on regional utilities through CSOs
- far greater private sector involvement in metropolitan areas
- increasingly divergent service offerings between metropolitan and regional areas
- the experience of the Millennium Drought, and the addition of desalination plants in a number of capital cities.

The NWI has driven a range of successful changes across Australia, in particular triggering rural water reforms and underpinning the implementation of the landmark Murray Darling Basin Plan. The NWI continues to be the most appropriate vehicle for continuing the reforms that have already progressed in rural water.

However, the NWI has not catalysed the same reform progress for the urban water sector. The relatively soft targets for urban water have not led to the widespread and sustained reforms that the sector requires. The reforms required in urban water are urgent, and distinct from those faced in rural areas. Consequently, urban water reforms warrant a separate national agreement. The time is right for a new national reform plan that focuses on urban water. This aligns with **Recommendation 6.12** of the *Australian Infrastructure Plan*, but strengthens the case for a specific agreement focused on urban water.

The Productivity Commission has previously found that the success of National Competition Policy was underpinned by recognition across all governments of the need for reform, broad agreement on the priority problem areas, and a solid conceptual framework to guide policy prescriptions.¹⁰⁶ That same level of consensus is required to trigger a new round of urban water reforms across Australia.

The most appropriate body to establish this consensus and an agreement on a new national urban water plan is COAG. This approach would provide an appropriate national forum for discussion, agreement, and continuation of objectives and actions through ongoing reforms of the sector. In order to drive continuing reforms to other parts of the NWI, this agreement should be amended to focus on rural water.

Recommendation 1

The Australian Government should agree to establish a new national urban water reform plan with all state and territory governments.

A new national plan that focuses on urban water is required to reinvigorate reform processes that were initiated through previous broad national water agreements, but through which reform progress has stalled. Agreement to establish this reform plan should be sought through the Council of Australian Governments, and the National Water Initiative should be amended to focus solely on rural water reforms.

National objectives are required to guide reform efforts

Agreement on objectives and key challenges is required among states and territories, the Australian Government and key industry stakeholders. Clear national objectives can help to frame discussions about urban water reform and provide a basis for all stakeholders in the urban water sector – across governments, regulators, utilities and communities – to engage with a national reform effort.

These national objectives should build on urban water reform efforts of recent decades, including principles that have underpinned the 1994 COAG Reform Framework, NWI planning (2008) and pricing (2010) principles, and subsequent reform efforts driven by the NWC.

Chapter 3 proposes a set of clear, strong objectives to provide the clarity and purpose required to drive national reform efforts. These objectives should be based on the following:

1. a focus on the long-term interests of users
2. efficiency and affordability
3. independence, transparency and accountability
4. security and resilience.

Strong national objectives should underpin all decision making in urban water, as a touchstone for ensuring that the sector remains focused on securing the best outcomes for users over the long term. Having a set of principles agreed by all states and territories can help to articulate the challenge of balancing competing objectives, and to guide reform of the institutions, frameworks and processes that govern urban water utilities.

Recommendation 2

The Australian Government should agree to a set of national objectives to guide the reform efforts of all state and territory governments.

These should be agreed to through the Council of Australian Governments and should be drawn from the following proposed objectives:

1. a focus on the long-term interests of users
2. efficiency and affordability
3. independence, transparency and accountability
4. security and resilience.

Leadership should be delivered through a national reform body

Strong national leadership is required to advance urban water reforms. Governance and institutional arrangements in the water sector are complex, and national reforms require prolonged commitment to drive lasting improvements.

The abolition of the NWC means that there is no independent umpire with distinct urban water sector expertise to monitor reform implementation and to drive further reform in the sector. While the Productivity Commission has been tasked with undertaking triennial assessments of progress against the NWI, this does not provide the same benefits as a reform body that can provide continuous guidance to the industry and governments, and to monitor ongoing progress against national reform targets in real time.

As Infrastructure Australia clearly stated in the *Australian Infrastructure Plan*, Australia needs a new national water reform agenda to ensure the water sector appropriately manages the challenges it faces and delivers the best outcomes for users. An independent and dedicated reform body is essential to ensuring reforms progress as agreed, and to provide a strong voice in debates when jurisdictions may consider deviating from agreed reform pathways or backsliding.

The Australian Government should establish an independent national body to drive reforms in the urban water sector, across metropolitan and regional areas. This body should have oversight across all jurisdictions, and report to COAG on progress against agreed reform targets and milestones. This leadership should build on the previous successes of the NWC, and energise governments and communities to take actions needed to progress national urban water reform over coming decades.

Recommendation 3

The Australian Government should establish an independent national body to drive urban water reforms. This body should be tasked with guiding reform across all states and territories, sharing lessons across jurisdictions, monitoring reform progress, and providing regular publicly available reports to the Council of Australian Governments.

Incentive payments should be used to catalyse reforms

Any national reform agenda must recognise that the bulk of reform will need to be carried out by each state and territory government. Many of these reforms will be complex and require each jurisdiction's government to build support for change by effectively communicating to users and taxpayers the need for reform, and the benefits it could bring.

Despite the strength of the economic case for change in urban water, some state and territory governments may be reluctant to embark on a reform journey where the costs are borne upfront, but the benefits accrue over time. This potential reluctance will need to ensure urban water reforms can be implemented across the country, and no jurisdiction is left behind.

The success of the national competition payments in driving micro-economic reform in the water sector suggests that incentive payments are a plausible mechanism for driving implementation of a revised urban water reform agenda. This view was supported by the *Harper Review*, which found that incentive payment approaches undertaken under the NCP helped states and territories to implement difficult reforms.¹⁰⁷ Harper found that although incentive payments were not large, they were of capable of maintaining support in the face of opposition to reform.¹⁰⁸

On this basis, and as Infrastructure Australia recommended in the *Australian Infrastructure Plan*, the Australian Government can and should use its funding position to drive the implementation of wider reforms. Through *Infrastructure Reform Incentives*, the Australian Government could incentivise reforms by providing additional funding in return for delivery of agreed reforms. The Australian Government signalled its support for incentive payments in response to the Plan.¹⁰⁹

As demonstrated in **Chapter 4**, jurisdictions find themselves at varying states of reform progress. To allow for separate starting points, milestones for action should be set for each jurisdiction. Incentive payments could



be made at jurisdictional reform milestones including the establishment of well-functioning, independent regulatory and pricing frameworks. Reporting against these milestones should be undertaken by an independent national body. This body should confirm that reform targets have been met before incentive payments are delivered to each state and territory, and should report to COAG on reform progress across all jurisdictions.

Recommendation 4

The Australian Government should provide incentive payments to state and territory governments for urban water reforms. Incentive payments should be provided – above and beyond existing projected allocations – for achievement of agreed reform targets. This process should recognise the various starting points of each jurisdiction, and provide payments at milestones, with protections against back-sliding.

5.4 Deliver nationally consistent urban water reforms

Regulatory and governance frameworks should be refined

The assessment in **Chapter 4** provides Infrastructure Australia's perspective on the state of reform across each state and territory's regulatory frameworks. These have been assessed against the national objectives established in **Chapter 3**, and the minimum and best practice criteria that flow from these.

A priority for a renewed reform effort should be to undertake a more collaborative assessment against agreed objectives, undertaken by an independent national urban water reform body. This would provide a common basis for understanding where each state and territory's regulatory frameworks are up to against clear targets, where each jurisdiction leads the way or has fallen behind, and what reform work remains to be done.

In some jurisdictions, reform efforts are likely to focus on refinement of existing governance structures and regulatory frameworks. In other jurisdictions, particularly where the sector is not meeting minimum criteria, more significant restructuring of processes and institutions will be required.

The specific reforms that will need to be undertaken in each state and territory should be agreed with respective governments, and clear reform targets and milestones set. These should, of course, build on earlier reforms laid out in the COAG Reform Framework and the NWI, but also provide stretch targets for all states over the short, medium and long term, with clear criteria for determining when they have been achieved.

The reforms should cover the range of criteria established in this paper, including refinements to the governance, institutions, decision-making processes and market rules in each jurisdiction. While the specific national objectives and reform targets should be subject to agreement by states and territories, a key focus should be on shifting to outcomes-focused regulation where the long-term interests of users are prioritised.

Recommendation 5

Reforms to regulatory and governance frameworks should be progressed across all jurisdictions. A national reform body should undertake an assessment of each jurisdiction's current frameworks, and establish clear milestones for reform actions that focus on securing better outcomes for users over the long term.

Collaboration and integration should be improved between regulators

Any recommitment to urban water reform must recognise the critical interaction between economic, environmental and health regulation. These different types of regulation should clearly interact when determining the efficient and prudent costs – and ultimately the prices required to recover the costs of service provision.

Reform to only one element of the regulatory framework without the others risks materially diminishing the benefits that can be achieved across the sector. Value and risk mitigation needs to be balanced with effective cross-regulatory frameworks. This requires a high degree of coordination across regulatory bodies, service providers and levels of government.

Without formalised and transparent procedures for collaboration, achieving common outcomes and avoiding conflicting objectives will be increasingly difficult. Communication and effective documentation will support the development of objectives that are consistent between agencies. Poorly identified and inconsistent links between economic, public health and environmental regulation can detract from a necessary focus on customer needs and preferences.

The varying state of regulatory development across the country presents challenges, but also opportunities for knowledge sharing across borders. Greater communication and collaboration between equivalent bodies in different states and territories is also likely to assist with advancing reforms across the country. This could help to minimise costs and streamline reform processes by allowing reforming jurisdictions to learn from the successes and challenges of other jurisdictions that have undertaken similar reform.

Recommendation 6

Regulators should implement transparent processes to improve collaboration on urban water within their jurisdictions, establish clear delineation of regulatory functions, and drive the achievement of common objectives. The new national urban water reform body should establish a structured framework to draw lessons from reform leaders and share them with other jurisdictions, and to monitor progress of regulatory reform across the country.

Overcoming the regional divide should be a priority across the country

Customers in regional towns should not have to accept a lower standard of service delivery or regulatory oversight than those in metropolitan areas. The urban water sector in metropolitan areas highlights the benefits of planning and pricing reforms to ensure water is affordably and efficiently provided. These benefits should also be available to regional customers.

Many regional water utilities face complex demographic, structural and geographical challenges. In 2011, Infrastructure Australia commissioned a report to examine urban water performance in regional communities. This report found that regional utilities were hindered by factors including fewer human and financial resources, a lack of technical knowledge and expertise, inadequate infrastructure, poor maintenance and insufficient institutional incentives for utilities to comply with guidelines.¹¹⁰

To overcome the divide, national objectives should be applied to regional areas. Due to the disparate local conditions and starting points, a tailored approach to overcoming the specific challenges in each regional area may be required. A national reform body should work with jurisdictions and local utilities to develop frameworks for improving core functions, and extending the benefits of reform to their customers.

Regional utilities should better meet the long-term interests of their customers through more detailed planning processes. These plans should look beyond existing budgets to better anticipate risks, and plan for asset replacements and renewals in order to minimise costs over asset lifecycles. State and territory governments should provide resourcing and guidance to ensure planning processes are robust. This is likely to be most beneficial in regional New South Wales and Queensland, where utilities typically operate on a small scale. In these areas, urban water is a local council responsibility, and limited resources make long-term planning an ongoing challenge.

Using scale to improve service quality in the United Kingdom and France

Past experiences in England, Scotland, Wales and France underscore the importance of scale.

In the 1970s, some of the small water authorities in England and Wales were amalgamated into 10 large authorities. In the 2000s, three regional authorities in Scotland were consolidated into a single authority, Scottish Water. Both reforms contributed to significant gains for customers through improvements in scale and efficiency. These reforms also helped to unlock additional private investment, leading to improvements in innovation and service quality over time.

In France, urban water is a municipal responsibility. More than 20,000 public entities are responsible for providing water and wastewater services, many of which lack the critical mass to efficiently supply water themselves.¹¹¹

In order to improve efficiencies through service delivery, French municipal councils often enter long-term contracts with private companies. Under these contracts, municipal associations retain ownership of water supply assets and responsibility for major investments. All other responsibilities – including management, maintenance and billing – are transferred. As a result, three companies account for the vast majority of the French market, thus providing strong economies of scale.

To improve efficiency and affordability, regional utilities should look to build scale where feasible through amalgamations, shared services or collaborative procurements with surrounding utilities. This could include contracting out services to private companies which have greater scale in providing those services, or undertaking common procurement processes to access efficiency-enhancing technologies such as remote asset monitoring and control. This can also help to improve resilience of local water supplies, by enabling risk-sharing between utilities during shortages and by broadening expertise in managing supply risks.

Improved transparency and cost recovery in regional areas should also be key priorities for reform. Consistent national reforms should ensure that regional utilities achieve full cost recovery where possible, and that financial data on the performance of regional utilities is robust and annually reported. Where state and territory governments currently provide funding through grants, these arrangements should be replaced by community service obligations. These CSOs can provide assurance to governments, utilities and the community that funding and planning processes are robust, and that taxpayer funding is being efficiently deployed.

Compliance monitoring should also be strengthened to ensure safety and security for regional customers. Transparent, robust and annual reporting of all health and environmental regulations would provide regional customers with information on the risks and trade-offs required to mitigate safety and security issues. In order to provide better information on performance outcomes

in regional areas, an independent national body should be provided with sufficient resources to undertake an assessment of urban water across regional areas, and monitor compliance with key performance targets.

Recommendation 7

Australian governments should prioritise improving urban water services in regional areas. Reform efforts in regional areas should reflect national objectives but work with local water managers to develop reforms that suit each area's unique features and challenges. These reforms should focus on:

- increasing scale wherever possible to improve efficiency
- improving cost transparency and cost recovery, including a shift from grant funding to community service obligations
- developing more transparent frameworks for monitoring compliance with health and environmental regulations.

An independent national body should undertake ongoing reviews of urban water outcomes in regional areas and monitor compliance with key performance targets.

Moving to better long-term planning should be a priority

For utilities, long-term planning should be a core function. This includes looking to the future to ensure risks are being managed, supply will be able to meet demand, and customers' expectations of service quality will be met. However, this planning is not being routinely undertaken across many utilities, leaving users at risk of declining service quality or rising costs.

As highlighted in **Chapter 2**, the failure to undertake long-term planning can, at least in part, be due to a lack of certainty about the funding utilities will receive over coming years. This impacts regional areas hardest, where low cost recovery may mean that utilities are reliant on subsidies through CSOs to sustain services year-on-year. Where grants are provided for capital works, government funding may not cover operational and maintenance expenses, further limiting these utilities' capacity to plan for the future with confidence.

Other pressures may also complicate long-term planning and investment by utilities. Governments or regulators may seek to limit increases in customer bills through pricing determinations. This can prevent utilities from recouping sufficient costs to cover the capital costs of asset renewals or replacement that may be more efficient over the long term. If utilities cannot source financing for these expenses at reasonable cost, they may instead seek to unduly prolong the life of ageing infrastructure, resulting in higher costs for customers and taxpayers over the long run. Regulatory processes should seek to ensure that utilities' incentives align with the interests of their customers, and that these utilities have sufficient expertise and capacity to deliver services in line with their long-term plans.

Taking steps towards greater efficiency of planning and investment over the long term requires coordination between governments, regulators and utilities. All entities must recognise the value of moving towards a longer term planning approach and be prepared to adapt their role within the broader regulatory and governance frameworks. Required actions are likely to include:

- establishing a detailed audit of each utility's assets, including condition and performance
- undertaking projections of future supply and demand, including risk-based and scenario planning
- planning to meet those projects and appropriately mitigating risks
- benchmarking projections and budgets across similar utilities
- promoting and incorporating community feedback on plans, including expectations on service quality and willingness to pay
- ensuring utilities have the appropriate resources and skills to address challenges
- making plans transparent and accessible to the community
- developing and agreeing to longer term budgets that balance efficiency with security and reliability
- tying plans to broader reform objectives set out in a new reform agenda
- establishing clear performance targets, with public reporting and accountability for results.

Recommendation 8

Regulators should require governments and utilities to develop and regularly update plans that best meet the needs of users over the long term, with clear forward funding allocations.

Utilities should seek to minimise costs over a long planning horizon by anticipating future risks and cost drivers, making better use of existing assets, and considering whole-of-asset lifecycles. Governments should support these outcomes by providing greater certainty over budgetary allocations. Regulators should monitor and report on the adequacy of planning and investment processes in each jurisdiction.

Pricing should drive efficiency, sustainability and innovation

Pricing should promote cost recovery, competition, innovation, efficient investment and improvements in water conservation. This requires governments and regulators to ensure:

- independence and transparency of price setting processes
- balanced consideration of current and future costs to promote efficient investment and minimise costs to customers over the long term
- that market rules provide sufficient incentives for innovation in service delivery
- appropriate incentives for utilities to promote water conservation measures
- that wholesale pricing and third party access settings do not stifle competition or prevent market entry for new suppliers.



These measures are in place to varying degrees across states and territories. As highlighted in **Chapter 4**, pricing regulation still falls short of best practice across all jurisdictions. Each government should continue to put in place the measures laid out in previous national agreements, most particularly the NWI Pricing Principles, including price setting processes that are genuinely independent from government, in order to ensure best outcomes for customers over the long term.

Developments in urban water warrant a thorough, strategic review of market rules in each jurisdiction. A range of factors, including the addition of new forms of supply augmentation and developments with on-site recycled water and sewer mining facilities, bring new challenges for pricing regulators. Rules should keep pace with these changes in service delivery in order to promote competition, efficient investment and equitable outcomes for users, who should share a fair burden of the costs of operating and maintaining legacy networks.

Demand management is likely to become increasingly important in dense urban environments. Smart meters, combined with metering of individual households for new multi-unit dwellings, could provide clearer price signals to customers. Building codes have been updated to enforce the installation of sub-meters in all new multi-unit developments in a number of states, however no such requirements are in place in South Australia, Tasmania and the Northern Territory.

Pricing approaches that have worked in the past may no longer deliver best outcomes for all users. For example, postage stamp pricing – where all customers across a specific geographic area pay a uniform price – may not be best suited for evolving urban water services. Postage stamp pricing (or state-wide pricing in jurisdictions with a single utility) is a long-standing, common approach to

pricing in the urban water sector. While this approach is simple to administer and easy to understand, it may mask the true cost of service delivery and impede competition. Similarly, postage stamp pricing may stifle water conservation efforts by customers and utilities, since it does not provide direct incentives for utilities to promote reduced water use by metered households and businesses.

Since postage stamp pricing is applied almost universally, it would require a gradual phasing out. This process should be considered incrementally, and undertaken where the benefits of moving to a more sophisticated pricing model outweigh the costs of transitioning.

Recommendation 9

Australian governments should ensure that pricing and market rules for urban water promote competition, innovation, efficient investment and improvements in water conservation. Developments in urban water warrant a thorough, strategic review of market rules in each jurisdiction. Over time, governments should consider phasing out postage stamp pricing to a more sophisticated pricing model that delivers better outcomes for all users.

Harnessing opportunities for greater efficiency through private sector involvement

A key recommendation of the *Hilmer Review* in 1993, and applied through the subsequent National Competition Policy, was for governments to remove barriers to competition and apply competitive neutrality principles to government-owned businesses. As a result, state and

territory governments initiated a process of corporatising urban water service provision. Through NCP, the responsibility for delivery of urban water services shifted from government-run departments to utilities that were still owned by governments but operated at arm's length from political decision making, with independent boards and executive governance.

Corporatisation has brought widespread benefits to the urban water sector. Government ownership under a regulated monopoly model, in place across all jurisdictions, restricts competition for urban water service delivery. Corporatisation has supported competition through a range of contracting and partnership options. This has created opportunities for greater private sector involvement in service delivery.

Private sector involvement in urban water is typically constrained to contractual arrangements for activities including maintenance, operating, design and construction work – which is outsourced by government-owned utilities. Competitive contracts and partnerships with private providers have typically led to improvements in efficiency through a focus on costs, resulting in an increased innovation and adoption of new technologies. These benefits could be shared more broadly across the sector, with the Australian Water Association reporting that 72% of Australian water sector professionals believe there is an opportunity for more private sector involvement.¹¹²

Harnessing the benefits of private sector participation requires a recommitment to corporatisation principles. A lack of independence, transparency and accountability in decision making limits the willingness and capacity of the private sector to commit to developing Australia's urban water sector through investment in innovation and development of local workforces. In smaller metropolitan and regional areas, more transparent and reliable commitments to CSO arrangements could help to mitigate risks for new entrants, and attract greater private sector interest in providing services.

As part of broader regulatory and governance reforms, governments should review their frameworks against the corporatisation principles set out through the *Hilmer Review*, NCP and COAG Reform Framework. Governments should also review legislative and policy frameworks to ensure third party access and other arrangements are not unduly restricting entry for new suppliers, or limiting competition and innovation in service delivery among existing service providers.

Recommendation 10

Australian governments and utilities should recommit to corporatisation principles and increase private participation in the urban water sector where appropriate. Private participation through partnerships and contracts with government can bring increased focus on efficiency improvements, innovation and customer-focused service delivery. Governments should look to harness private sector expertise where there are clear benefits for urban water users and taxpayers, and ensure existing settings do not unduly restrict competition and innovation.

5.5 Consider further reforms over time

National regulation could improve urban water outcomes over time

Delivery of urban water services comes with distinct challenges across each state and territory. For this reason, and by virtue of Australia's Constitution, disparate urban water service models have developed in each jurisdiction, with their own administrative and oversight arrangements. While national agreements have sought to tie these arrangements to common principles, reform has been inconsistently applied. Consequently, there is significant variation between each state and territory's regulatory and governance frameworks. As illustrated in **Chapter 4**, some jurisdictions are closer to best practice than others, but all have work to do if they are to ensure their individual approaches deliver best outcomes for users over the long term.

Given the extent of variation in regulatory and governance approaches across jurisdictions, moving to a national system of regulation is not currently feasible. Oversight and regulatory functions would not be compatible across jurisdictional boundaries. Instead, the short to medium-term priority for governments should be to implement nationally consistent reforms in line with a new urban water reform plan.

Once nationally consistent reforms have been rolled out across all jurisdictions, all governments should consider moving to a system of national regulation. A staged transition of each form of regulation – with economic and pricing regulation as the highest priority – may be most beneficial, and ensure user outcomes are not compromised as regulatory responsibility is shifted.

International lessons provide insight into the benefits of privatisation

Many countries have privatised their urban water sectors. While substantial benefits have been realised in several international jurisdictions, others had mixed outcomes where regulatory settings did not appropriately curb monopoly influence or incentivise efficient investment. Greater private sector involvement can take many forms including leasing arrangements, private finance initiatives and private ownership. Australia needs to consider these choices, heed international lessons and realise that benefits are available, under the right conditions.

Privatisation of the United Kingdom's water sector provides several lessons on what could be gained from a well-considered privatisation process. Financial

and political pressure on government-owned utilities, and obligations to keep up with European Union requirements led the UK to privatise. This process was successful in delivering £50 billion of urban water investment in the 15 years after privatisation. Privatisation in England, Scotland, Wales and France demonstrated that economies of scale can be accomplished through the amalgamation of providers.

Privatisation in the UK improved the incentives for managers to increase efficiency by establishing stronger rewards for reducing costs and increasing revenues, which spurred innovation. Privatisation also contributed towards a clearer delineation between policy-makers, regulators and managers.

The benefits of national regulation could be substantial. Aside from reducing the total bureaucratic burden of maintaining separate regulatory agencies in each state and territory, this would also be likely to improve regulatory efficiency for utilities and others in the industry. A national regulator would be well-placed to ensure continued commitment to best practice regulatory principles across the country, prevent backsliding, and evolve national standards in line with global best practice. This would also be likely to help Australia's urban water sector to attract global expertise and investment, since the hurdles for entry and compliance would be reduced.

For lessons on a move to national regulation, Australia should look to the United Kingdom, where the Water Services Regulation Authority (Ofwat) has been the sole economic regulator for the water and sewerage sectors in England and Wales since 1989. Ofwat operates outside of ministerial control, with an independent board and executive. Established when UK water utilities were privatised, Ofwat has provided a strong independent voice as the sector has evolved, and been a continuous advocate for more competition and better customer outcomes.

Laying the right foundations for private ownership in future

The urban water sector in many parts of Australia may not yet be ready for private ownership, but privatisation should be a key consideration on states and territories' planning horizons. As with other forms of infrastructure with monopoly characteristics, strong regulatory and corporate foundations are required to ensure users' long-term interests are prioritised under private ownership. Done well, privatisation can bring benefits for customers through improvements in efficiency, innovation and customer focus.

As outlined in the *Australian Infrastructure Plan*, governments should define a pathway to private ownership of their urban water assets. This pathway should include the regulatory, competitive, structural and governance reforms outlined in this paper. These reforms are worthwhile in their own right, but have the added benefit of shaping urban water as a more independent, transparent and secure environment for private investment.

Reforms should aim to improve the stability and openness of the urban water sector, with strong oversight and regulatory incentives for delivering service quality improvements and minimising customers' bills. All infrastructure owners – whether private or public – should receive strong signals for efficient investment in urban water networks that will safeguard user outcomes against a range of cost drivers, including changing urban environments and increasing climate volatility.

Recommendation 11

Once nationally consistent reforms have been rolled out across all jurisdictions, all governments should consider moving to a system of national regulation. An independent national reform body should make recommendations to the Council of Australian Governments on a timeline for this transition, and provide advice on the actions required to complete it. National regulation of economic and pricing regulation should be prioritised.

Privatisation of urban water assets can also bring broader benefits for taxpayers. Urban water assets are likely to be attractive to the private sector due to regulated rates of return, revenue certainty and stability, and returns aligned with low-risk, long-lived revenue streams. With around \$100 billion of urban water assets in public ownership across the country, there is significant potential for using some of this capital to reinvest in new infrastructure investments, or for other government services that could unlock significant productivity improvements.

Governments may seek to stage privatisation over a longer period, or initially privatise only some components of urban water networks to test regulatory settings and build community support for change. A staged process may include financing infrastructure investments, acquiring and operating discrete assets, or acquisition and operation of full water businesses.

Privatisation of urban water assets is ultimately a decision for governments in each state and territory, and should only be undertaken where governments have secured the support of communities. This requires extensive consultation and communication of the benefits and risks of reform. Recognising the challenges of this process, a national reform agenda should respect the autonomy of each state and territory government to engage with its population and decide on the form of ownership that best meets their communities' needs and preferences.

Recommendation 12

Once national reforms have been carried out, Australia's governments should consider transitioning state-owned urban water assets to private ownership. Following improvements to the openness and stability of the urban water sector, and once its regulatory and governance frameworks are sufficiently robust, private ownership should be considered in each jurisdiction. Reforms should proceed where state and territory governments have secured community support for change. Regardless of each government's position on ownership of urban water networks, jurisdictions should continue with the reforms outlined in this paper to deliver better long-term outcomes for users.

5.6 Next steps: Where to from here?

Reform should build on the work of the Productivity Commission

The Productivity Commission is expected to provide its final inquiry report on *National Water Reform* to the Australian Government in December 2017. This inquiry will provide an assessment of progress towards achieving the objectives and outcomes of the NWI. The Productivity Commission is required to assess drivers of reform, the adequacy of NWI reforms, future challenges and the role of the NWI in improving reform outcomes.¹¹³

The Productivity Commission's inquiry process provides an excellent opportunity to engage a broad set of stakeholders on the need for reform and how it should be implemented. While this inquiry does not solely focus on urban water reform, it provides a platform on which to build the case for further reforms of the urban water sector beyond those laid out in the NWI.

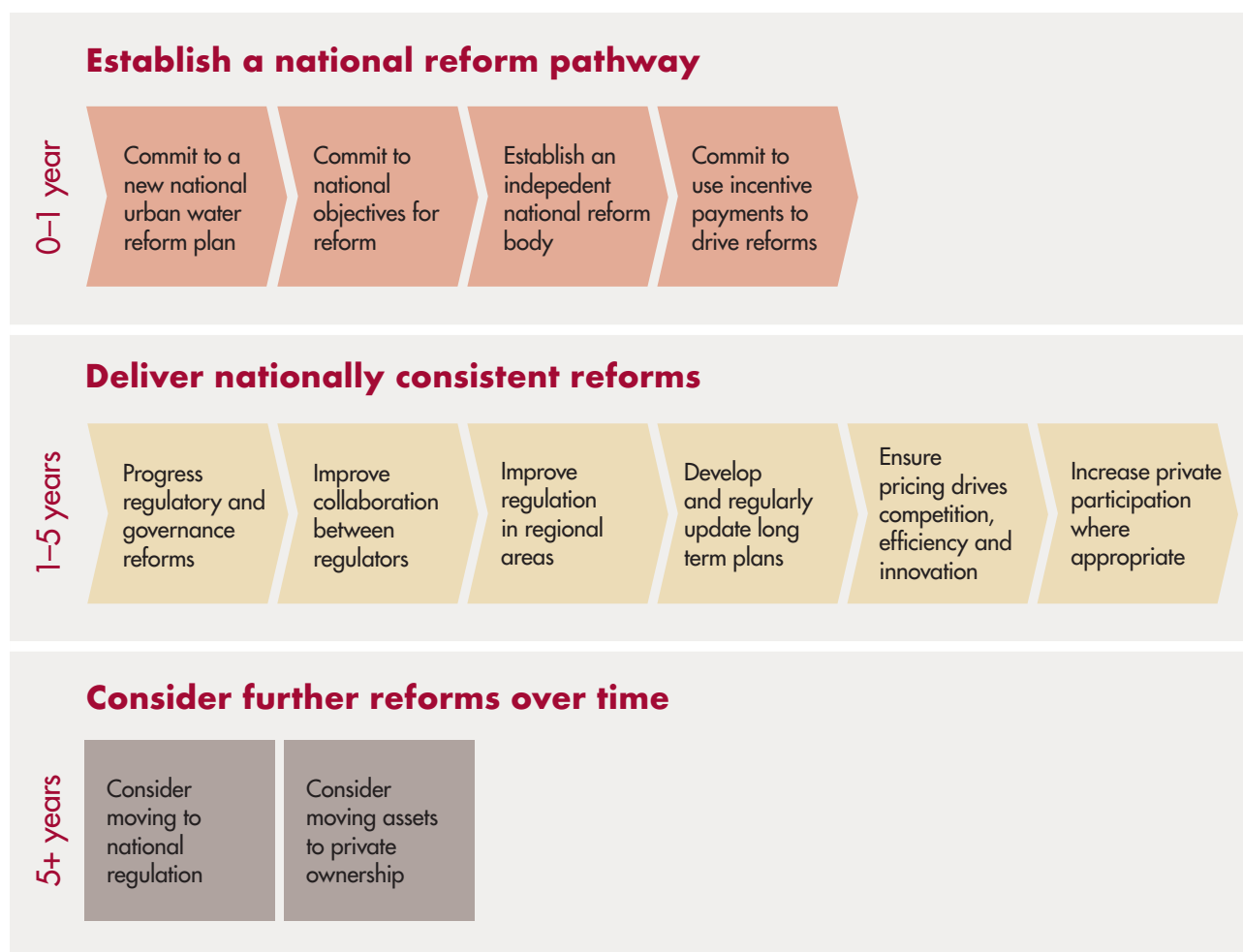
Infrastructure Australia's paper does not seek to duplicate the Productivity Commission's work but to support its core mission in building the case for reform, and establishing a viable pathway for reform. It will be essential to harness the momentum created through this inquiry, and transform this into committed actions to reform the urban water sector.

Establishing a timeline for governments to get on with the job of reform

The recommendations in this chapter establish a pathway for reform of Australia's urban water sector. While many of these reforms will take time to be rolled out, it is important that Australia's governments get on with the task of initiating reforms. These reforms are summarised in **Figure 13**.

The first stage of this reform process is to put in place the structures through which reform can be implemented. This includes establishing consensus among governments on the need for reform and agreeing to national objectives to guide reform – agreements that would best be sought and confirmed through COAG. An independent national body should be established to guide reforms, as well as a mechanism through which reform can be driven – incentive payments to states and territories. This first stage can and should be undertaken in the 12 months following the completion of the Productivity Commission's paper – by the end of 2018.

Figure 13: A pathway for national urban water reform



Source: Infrastructure Australia

The second stage – rolling out nationally consistent reforms – should be implemented over the next five years. This includes a range of refinements to regulation and governance in each state and territory, as well as improvements to long-term planning and pricing frameworks, and enhanced collaboration between regulators. Regional outcomes should be prioritised to ensure users outside major cities also benefit from progress in urban water delivery, and private participation should be encouraged where there is potential for it to improve services and reduce costs.

The final stage should be considered following delivery of nationally consistent reforms. Moving to a national regulator and privatising urban water assets could provide substantial benefits to users if implemented in the right way – but the sector should be reformed first. These future decisions are not inevitable consequences of broader reform, but present opportunities for future governments to consider.

Urban water reform is too important to delay any further. Now is the time for reform.

Appendix A

Glossary of key concepts

Alternative water sources: This term encompasses a range of water sources that supplement traditional supply sources such as dams and reservoirs, and can improve the sustainability and resilience of urban water supplies through diversification of supply. These alternative sources include:

- **recycled water:** purified water from wastewater treatment plants
- **rainwater collection:** capturing rain from non-permeable surfaces such as house roofs
- **stormwater harvesting:** water collected from drains, which is then stored and treated
- **groundwater:** water captured by underground reservoirs in soil or rock.

Bulk water: Water that is captured and stored (often in waterways and dams), and transported for supply to urban or rural water customers. Depending on the service delivery model in each jurisdiction, the bulk water provider may also be the retail utility, or it may on-sell wholesale water to retailer-distributors.

Community Service Obligation (CSO): An arrangement where a government provides support for a utility to provide a range of urban water services to a set of users. CSOs are generally in place where the utility cannot recover costs through user charges, and so the government effectively subsidises service delivery through funding from the broader tax base.

Corporatisation: The delivery of services by a government-owned entity that operates at arm's length from government. These entities have a corporate decision-making structure, which seeks to replicate the management approach of private sector companies.

Gigalitre (GL): One billion litres, or 1,000 megalitres. For scale, the capacity of Sydney Harbour is 500 GL. One GL would fill 400 Olympic swimming pools.

Megalitre (ML): One million litres. It would take approximately 2.5 ML to fill one Olympic swimming pool.

Non-potable water: Water that is not fit for human consumption and has either not been treated, or has been treated to a lower standard than potable water. This may be suitable for use around the house (for example, flushing toilets, washing cars or watering the garden) or industrial uses.

Postage stamp pricing: Under this common approach to pricing urban water, all customers serviced by a water utility pay the same charge, regardless of location. This effectively creates cross-subsidies between those in areas where the average cost to supply services to each connected property is lower and those areas where average costs of supply are higher (for example, areas on the fringe of cities).



Potable reuse: This describes broad processes where wastewater re-enters or is mixed with drinking water supplies, either directly or indirectly:

- **direct potable reuse:** stormwater or wastewater is treated and mixed directly into potable water supplies
- **indirect potable reuse:** stormwater or wastewater is added to a dam or another form of water storage, with the intention that it will be treated and used as part of potable water supplies.

Potable water: Water that is safe for human consumption, and is subject to monitoring across most of Australia under the *Australian Drinking Water Guidelines*. Otherwise known as drinking water, this is often used for all household purposes, including flushing toilets, watering gardens and washing cars.

Price setting: Pricing regulation is used to determine how much a regulated utility may charge its customers. This tariff is usually set to allow utilities to recover efficient costs and a fair return, balanced with consideration of the equity and affordability impacts of pricing on the community. Broad forms of price setting include upper bound (a ceiling or maximum price utilities may charge), lower bound (regulator sets a floor or minimum price), and cost-reflective pricing.





Regulated Asset Base (RAB): The RAB is the total value of the stock of assets under management by a utility. This value is used by regulators as a way of determining prices the utility may charge customers to cover their costs and generate a fair return. Changes in RAB are calculated each year, taking into account depreciation of assets, inflation, and capital investments.

Weighted Average Cost of Capital (WACC): The WACC is a measure of the ‘fair’ annual rate of return on a utility’s asset base. This is a key input used by economic regulators to determine the revenue requirement of utilities to cover their financing costs.

Appendix B

Summary of criteria for benchmarking





B.1 Economic regulation

Objective	Minimum standard	Best Practice
<p>A focus on the long-term interests of users</p> 	<ul style="list-style-type: none"> ✓ Regular reviews of regulatory frameworks and licences, informed by feedback 	<ul style="list-style-type: none"> ✓ Long-term interests of customers are embedded in frameworks ✓ Reporting against clear user-focused performance targets ✓ Clear policy framework for competition in urban water
<p>Efficiency & affordability</p> 	<ul style="list-style-type: none"> ✓ Efficient cost recovery based on best available information ✓ Efficient risk and cost sharing between service providers and customers ✓ Appropriate forms of price control and tariff structures 	<ul style="list-style-type: none"> ✓ Light-handed and flexible price control and tariff structures ✓ Clearly specified incentive mechanisms for cost and service improvements ✓ Well-integrated, robust benchmarking to complement efficient cost forecasts
<p>Independence, transparency & accountability</p> 	<ul style="list-style-type: none"> ✓ Clear, well-defined regulatory objectives and measurable service standards ✓ Transparent and consultative regulatory decision making ✓ Separation of decision-making, regulatory and policy-making functions 	<ul style="list-style-type: none"> ✓ Clear regulatory objectives, powers and functions, specified in legislation ✓ Genuinely independent regulator with deterministic decision-making powers and no scope for Ministerial influence ✓ Appeal body for independent merits reviews on clearly specified grounds ✓ Consistent, transparent stakeholder engagement between regulators, providers and customers ✓ Open, consultative price reviews and communication of guidance ✓ Formalised and transparent consultation between regulators
<p>Security & resilience</p> 	<ul style="list-style-type: none"> ✓ Regular compliance monitoring and reporting 	<ul style="list-style-type: none"> ✓ Openness to innovative ways of achieving regulatory objectives





B.2 Environmental regulation

Objective	Minimum standard	Best Practice
<p>A focus on the long-term interests of users</p> 	<ul style="list-style-type: none"> ✓ Regulatory reviews shared with service providers and other jurisdictions ✓ Definition and control approach to regulation, with ability to apply penalties 	<ul style="list-style-type: none"> ✓ Regulator empowered and required to collaborate with relevant agencies to achieve joint objectives and integrate processes where appropriate
<p>Efficiency & affordability</p> 	<ul style="list-style-type: none"> ✓ Informal, ad hoc consultation between environmental and other regulators 	<ul style="list-style-type: none"> ✓ Outcome-based regulation that is flexible, risk-based, proportionate, and incentivises innovation ✓ Focus on reducing the regulatory burden by ensuring benefits of regulation outweigh costs ✓ Adoption of market-based instruments and incentives to achieve outcomes cost effectively ✓ Simple, transparent and easily enforceable compliance frameworks that use a risk-based approach
<p>Independence, transparency & accountability</p> 	<ul style="list-style-type: none"> ✓ Clear objectives and principles in environment act ✓ Regulator within environment department, governed under its own Act, reporting to a Minister ✓ Regulator can provide recommendations to relevant agencies ✓ Centrally managed monitoring and reporting mechanisms, with compliance auditing ✓ Increased transparency through stakeholder engagement 	<ul style="list-style-type: none"> ✓ Clear objectives that can be applied across the water cycle and encourage long-term decision making, developed through collaboration with key stakeholders ✓ Localised objectives with performance indicators and data that can be easily monitored ✓ Genuinely independent regulator with clear, well-understood mission, deterministic decision-making powers and no scope for Ministerial influence ✓ Regular reviews of the environmental regulatory approach and framework ✓ Transparency of regulator's decisions, processes, ability and capacity ✓ Appeal body for independent merits reviews on clearly specified grounds ✓ Monitoring frameworks limit burden on providers by aligning with broader reporting requirements and allowing for some degree of self-review ✓ Institutionalised, consistent and transparent engagement with regulated entities and other stakeholders ✓ High degree of transparency, including sharing of data and public engagement
<p>Security & resilience</p> 	<ul style="list-style-type: none"> ✓ Bi-annual surveillance of catchment and waterway condition 	<ul style="list-style-type: none"> ✓ Comprehensive, proactive monitoring of waterways using real-time systems to support decision making

B.3 Health regulation

Objective	Minimum standard	Best Practice
<p>A focus on the long-term interests of users</p> 	<ul style="list-style-type: none"> ✓ Regulator cooperates with other bodies where required and seeks feedback on an ad hoc basis ✓ Informal and ad hoc consultation between health and other regulators 	<ul style="list-style-type: none"> ✓ Service standards should clearly legislate guidelines and be well-defined, measurable and meaningful ✓ Long-term interests of customers prioritised in planning and decision making ✓ Flexibility to adapt regulations to local context where appropriate
<p>Efficiency & affordability</p> 	<ul style="list-style-type: none"> ✓ Clear obligations and performance targets for providers, based on a risk-based approach, subject to annual review 	<ul style="list-style-type: none"> ✓ Balance of prescriptive regulation with opportunities for innovation and incentive-based regulation where appropriate ✓ Focus on reducing the regulatory burden by ensuring benefits of regulation outweigh costs ✓ Regulator empowered and required to collaborate with relevant agencies to achieve joint objectives and integrate processes where appropriate
<p>Independence, transparency & accountability</p> 	<ul style="list-style-type: none"> ✓ <i>Australian Drinking Water Guidelines</i> (ADWGs) and <i>Australian Guidelines for Water Recycling</i> (AGWRs) referenced in legislation and service standards ✓ Regulator within health department, governed under its own act, reporting to a Minister ✓ Monitoring frameworks should include reporting requirements, and include audits and reviews at the regulator's discretion ✓ Transparent regulatory reviews and decision-making frameworks ✓ Engagement with regulated entities and other agencies undertaken as required 	<ul style="list-style-type: none"> ✓ ADWGs and AGWRs should not conflict with other guidelines, and be capable of being applied to all providers ✓ Regulator should have deterministic rather than recommendatory powers, and a well-understood mission with specified core objectives ✓ Monitoring frameworks limit burden on providers by aligning with broader reporting requirements and allowing for some degree of self-review ✓ Transparency of regulator's decisions, processes, ability and capacity, with consultation on draft decisions ✓ High degree of transparency, including sharing of data and public engagement ✓ Institutionalised, consistent and transparent engagement with regulated entities and other stakeholders ✓ Formalised and transparent consultation between health and other regulators
<p>Security & resilience</p> 	<ul style="list-style-type: none"> ✓ Water quality plans prepared and sent to regulator on a jurisdictional basis ✓ Simple and easily understood enforcement frameworks 	<ul style="list-style-type: none"> ✓ Simple, transparent and easily enforceable compliance frameworks that use a risk-based approach ✓ All service providers prepare and submit water quality plans to regulators, consistent with national standards ✓ Early involvement of service providers and other stakeholders in planning and review processes

B.4 Pricing regulation

Objective	Minimum standard	Best Practice
<p>A focus on the long-term interests of users</p> 	<ul style="list-style-type: none"> ✓ Adoption of consumption-based pricing ✓ The water usage charge should comprise only a single usage charge ✓ Where practical, costs should be disaggregated on the basis of location 	<ul style="list-style-type: none"> ✓ Two-part tariffs with single variable charge set at the marginal cost of supply ✓ Individual metering for new developments ✓ Where councils are amalgamated, prices should not be rationalised
<p>Efficiency & affordability</p> 	<ul style="list-style-type: none"> ✓ Charges should be set to achieve full cost recovery, including a return on capital for all new expenditure. All CSOs should be publically reported ✓ Adoption of either renewals annuity or RAB (building blocks) approach ✓ Developer charges and government contributions excluded or deducted from the RAB or offset using other mechanisms so that a return on capital is not recovered from customers 	<ul style="list-style-type: none"> ✓ Management of the impact of rising water bills on low income households through mechanisms other than broad-based water price reductions ✓ Implementation of an RAB (building blocks) approach ✓ A transparent cost sharing framework should be in place to allocate costs between government and customers
<p>Independence, transparency & accountability</p> 	<ul style="list-style-type: none"> ✓ Use of independent bodies to set or review prices or price setting processes ✓ Urban water tariffs should be set using a transparent methodology, taking into account public comment or public scrutiny 	<ul style="list-style-type: none"> ✓ Government should not intervene in the price setting process ✓ Capital and operating costs should be tested for prudence and efficiency by independent regulators. All costs should be linked to clear service standards with no arbitrary exclusion of costs or investments
<p>Security & resilience</p> 	<ul style="list-style-type: none"> ✓ Risks should be clearly acknowledged and efficiently addressed through capital and maintenance planning 	<ul style="list-style-type: none"> ✓ Efficient risk mitigation that optimises capital and maintenance spending over whole-of-asset lives in line with best practice investment principles

References

- ¹ Aither (2017) *Urban water sector: Future cost and affordability analysis: The role of water reform in alleviating national household affordability issues*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- ² Melbourne Water (2017) *Natural and urban water cycle*, available at: <https://www.melbournewater.com.au/community-and-education/about-our-water/natural-and-urban-water-cycle>
- ³ Aither (2017) *Urban water sector: Future cost and affordability analysis: The role of water reform in alleviating national household affordability issues*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- ⁴ Productivity Commission (2017) *National water reform: Terms of reference*, available at: <http://www.pc.gov.au/inquiries/current/water-reform/terms-of-reference>
- ⁵ Water Services Association of Australia and Infrastructure Partnerships Australia (2015) *Doing the important, as well as the urgent: Reforming the urban water sector*, available at: <https://www.wsaa.asn.au/publication/doing-important-well-urgent-reforming-urban-water-sector>
- ⁶ Water Services Association of Australia and Infrastructure Partnerships Australia (2015) *Doing the important, as well as the urgent: Reforming the urban water sector*, available at: <https://www.wsaa.asn.au/publication/doing-important-well-urgent-reforming-urban-water-sector>
- ⁷ Infrastructure Australia (2015) *Australian infrastructure audit*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/Australian-Infrastructure-Audit.aspx>
- ⁸ Water Services Association of Australia and Infrastructure Partnerships Australia (2015) *Doing the important, as well as the urgent: Reforming the urban water sector*, available at: <https://www.wsaa.asn.au/publication/doing-important-well-urgent-reforming-urban-water-sector>
- ⁹ Australian Bureau of Statistics (2016) *4610.0: Water account, Australia, 2014-15*, available at: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4610.0>
- ¹⁰ National Competition Council (2007) *About the National Competition Policy*, available at: <http://ncp.ncc.gov.au/pages/about>
- ¹¹ National Water Commission (2007) *Biennial assessment of progress in water reform*, available at: <http://catalogue.nla.gov.au/Record/4269995>
- ¹² Water Services Association of Australia (2013) *Submission to the National Water Commission on the future of the urban water industry*, available at: <https://www.wsaa.asn.au/publication/submission-national-water-commission-future-urban-water-industry>
- ¹³ Harper, I. et al (2015) *Competition policy review: Final report*, available at: <http://competitionpolicyreview.gov.au/final-report/>
- ¹⁴ Australian Government Senate Environment and Communications Legislation Committee (2014) *National Water Commission (Abolition) Bill 2014*, available at: http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/NWC/Report
- ¹⁵ Infrastructure Australia (2016) *Australian infrastructure plan*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/Australian-Infrastructure-Plan.aspx>
- ¹⁶ Australian Bureau of Statistics (2013) *3222.0 – Population projections, Australia, 2012 (base) to 2101*, available at: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3222.0>
- ¹⁷ Australian Bureau of Statistics (2013) *3222.0 – Population projections, Australia, 2012 (base) to 2101*, available at: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3222.0>
- ¹⁸ Australian Bureau of Statistics (2017) *3218.0 – Regional population growth, Australia, 2016*, available at: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3218.0>



- ¹⁹ Infrastructure Australia (2015) *Australian infrastructure audit*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/Australian-Infrastructure-Audit.aspx>
- ²⁰ Water Services Association of Australia (2010) *Implications of population growth in Australia on urban water resources, Occasional Paper 25*, available at: <https://www.clearwater.asn.au/resource-library/publications-and-reports/implications-of-population-growth-in-australia-on-urban-water-resources.php>
- ²¹ Sydney Water (2016) *Water conservation report 2015-16*, available at: <http://www.sydneywater.com.au/SW/about-us/our-publications/reports-and-publications/index.htm>
- ²² Sydney Water (2016) *Water conservation report 2015-16*, available at: <http://www.sydneywater.com.au/SW/about-us/our-publications/reports-and-publications/index.htm>
- ²³ Australian Bureau of Statistics (2017) *3218.0 – Regional population growth*, Australia, 2016, available at: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3218.0>
- ²⁴ Schott, K., Wilson, S. & Walkom, S. (2008) 'Urban water reform: An industry perspective,' *The Australian economic review*, vol. 41, no. 4, pp. 413-19.
- ²⁵ McGee, C. (2013) 'Water,' *Your home: Australia's guide to environmentally sustainable homes*, Australian Government Department of the Environment and Energy, available at: <http://www.yourhome.gov.au/water>
- ²⁶ Bureau of Meteorology and CSIRO (2016) *State of the climate 2016*, available at: www.bom.gov.au/state-of-the-climate
- ²⁷ Bureau of Meteorology and CSIRO (2016) *State of the climate 2016*, available at: www.bom.gov.au/state-of-the-climate
- ²⁸ Bureau of Meteorology and CSIRO (2016) *State of the climate 2016*, available at: www.bom.gov.au/state-of-the-climate
- ²⁹ National Water Commission (2012) *Water policy and climate change in Australia*, available at: <http://apo.org.au/node/29262>
- ³⁰ Infrastructure Australia (2016) *Australian infrastructure plan*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/Australian-Infrastructure-Plan.aspx>
- ³¹ Bureau of Meteorology (2015) *Recent rainfall, drought and southern Australia's long-term rainfall decline*, available at: <http://www.bom.gov.au/climate/updates/articles/a010-southern-rainfall-decline.shtml>
- ³² Australian Bureau of Statistics (2013) *4602.0.55.003 – Environmental issues: Water use and conservation, Mar 2013*, available at: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4602.0.55.003>
- ³³ Productivity Commission (2011) *Australia's urban water sector: Inquiry report*, available at: <https://www.pc.gov.au/inquiries/completed/urban-water/report>
- ³⁴ Productivity Commission (2011) *Australia's urban water sector: Inquiry report*, available at: <https://www.pc.gov.au/inquiries/completed/urban-water/report>
- ³⁵ Bureau of Meteorology (2015) *Recent rainfall, drought and southern Australia's long-term rainfall decline*, available at: <http://www.bom.gov.au/climate/updates/articles/a010-southern-rainfall-decline.shtml>
- ³⁶ Bureau of Infrastructure, Transport and Regional Economics (2016) *Australian infrastructure statistics: Yearbook 2016*, available at: https://bitre.gov.au/publications/2016/yearbook_2016.aspx
- ³⁷ Bureau of Meteorology (2012) *Special climate statement 38*, available at: <http://www.bom.gov.au/climate/current/statements/>
- ³⁸ Bureau of Meteorology (2017) *National performance report 2015-16: Urban water utilities*, available at: <http://www.bom.gov.au/water/npr/>
- ³⁹ WA Water Corporation (2017) *Historical streamflow*, available at: <https://www.watercorporation.com.au/water-supply/rainfall-and-dams/streamflow/streamflowhistorical>

- 40 Sydney Water (2015) *Sydney Water's proposal to IPART on prices to apply from 1 July 2016*, available at: <https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Review-of-prices-for-Sydney-Water-Corporation-from-1-July-2016/02-Jul-2015-Sydney-Waters-pricing-proposal/Sydney-Water-s-proposal-to-IPART-on-prices-to-apply-from-1-July-2016>
- 41 Bureau of Meteorology (2017) *National performance report 2015-16: Urban water utilities*, available at: <http://www.bom.gov.au/water/npr/>
- 42 Engineers Australia (2010) *Infrastructure report card*, available at <http://www.engineersaustralia.org.au/infrastructure-report-card>
- 43 Cooperative Research Centre for Water Sensitive Cities (2016) *About the CRCWSC*, available at: <https://watersensitivecities.org.au/about-the-crcwsc/>
- 44 National Water Commission (2011) *Urban water in Australia: Future directions*, available at: <http://apo.org.au/node/24510>
- 45 Water Services Association of Australia (2010) *The WSAA report card for 2009-2010: Performance of the Australian urban water industry and projections for the future*, available at: <https://www.clearwater.asn.au/user-data/resource-files/ReportCard2010---FINAL.pdf>
- 46 Water Services Association of Australia and Infrastructure Partnerships Australia (2015) *Doing the important, as well as the urgent: Reforming the urban water sector*, available at: <https://www.wsaa.asn.au/publication/doing-important-well-urgent-reforming-urban-water-sector>
- 47 Bureau of Meteorology (2017) *National performance report 2015-16: Urban water utilities*, available at: <http://www.bom.gov.au/water/npr/>
- 48 Aither (2017) *Urban water sector: Future cost and affordability analysis: The role of water reform in alleviating national household affordability issues*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- 49 Melbourne Water (2017) *Natural and urban water cycle*, available at: <https://www.melbournewater.com.au/community-and-education/about-our-water/natural-and-urban-water-cycle>
- 50 Bureau of Meteorology (2017) *National performance report 2015-16: Urban water utilities*, available at: <http://www.bom.gov.au/water/npr/>
- 51 Aither (2017) *Urban water sector: Future cost and affordability analysis: The role of water reform in alleviating national household affordability issues*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- 52 Global Water Intelligence (2017) *Global water market in 2018: The transition to smarter spending in water & wastewater*, available to purchase at: <https://www.researchandmarkets.com/reports/4395555/global-water-market-in-2018-the-transition-to>
- 53 Aither (2017) *Urban water sector: Future cost and affordability analysis: The role of water reform in alleviating national household affordability issues*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- 54 Aither (2017) *Urban water pricing reform: National urban water pricing standards and implementation pathway*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- 55 Aither (2017) *Urban water sector: Future cost and affordability analysis: The role of water reform in alleviating national household affordability issues*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- 56 Aither (2017) *Urban water sector: Future cost and affordability analysis: The role of water reform in alleviating national household affordability issues*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- 57 Cave, M. (2009) *Independent review of competition and innovation in water markets: Final report*, available at: <https://www.gov.uk/government/publications/competition-and-innovation-in-the-water-markets-cave-review>
- 58 National Water Commission (2011) *Urban water in Australia: Future directions 2011*, available at: <http://catalogue.nla.gov.au/Record/5232511>
- 59 National Water Commission (2011) *Urban water in Australia: Future directions 2011*, available at: <http://pandora.nla.gov.au/pan/123802/20141214-0001/archive.nwc.gov.au/library/topic/urban/future-directions.html>
- 60 Essential Services Commission of South Australia (2017) *About us*, available at: <http://www.escosa.sa.gov.au/about-us/about-us>
- 61 Productivity Commission (2011) *Australia's urban water sector: Inquiry report*, available at: <https://www.pc.gov.au/inquiries/completed/urban-water/report>
- 62 CSIRO Energy & CSIRO Futures (2017) *Low emissions technology roadmap*, available at: <https://www.csiro.au/en/Do-business/Futures/Reports/Low-Emissions-Technology-Roadmap>
- 63 National Water Commission (2011) *Competition in the urban water sector: Waterlines 42*, available at: <http://pandora.nla.gov.au/pan/139145/20130318-1530/archive.nwc.gov.au/library/waterlines/42.html>
- 64 National Water Commission (2011) *Urban water in Australia: Future directions 2011*, available at: <http://pandora.nla.gov.au/pan/123802/20141214-0001/archive.nwc.gov.au/library/topic/urban/future-directions.html>
- 65 Productivity Commission (2011) *Australia's urban water sector: Inquiry report*, available at: <https://www.pc.gov.au/inquiries/completed/urban-water/report>
- 66 National Water Commission (2007) *Biennial assessment of progress in water reform*, available at: <http://catalogue.nla.gov.au/Record/4269995>



- ⁶⁷ Water Services Association of Australia (2013) *Submission to the National Water Commission on the future of the urban water industry*, available at: <https://www.wsaa.asn.au/publication/submission-national-water-commission-future-urban-water-industry>
- ⁶⁸ Productivity Commission (2011) *Australia's urban water sector: Inquiry report*, available at: <https://www.pc.gov.au/inquiries/completed/urban-water/report>
- ⁶⁹ Independent Pricing and Regulatory Tribunal NSW (2016) *Compliance Report – Licence compliance under the Water industry Competition Act 2006 (NSW) – October 2016*, available at: <https://www.ipart.nsw.gov.au/Home/Industries/Water/Alternate-water-utilities-WICA/Licence-Compliance-Reporting/Compliance-Report-Licence-compliance-under-the-Water-industry-Competition-Act-2006-NSW-October-2016>
- ⁷⁰ Frontier Economics & Arup (2017) *Urban water regulation reform*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- ⁷¹ Frontier Economics & Arup (2017) *Urban water regulation reform*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- ⁷² Aither (2017) *Urban water pricing reform: National urban water pricing standards and implementation pathway*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- ⁷³ Aither (2017) *Urban water pricing reform: National urban water pricing standards and implementation pathway*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- ⁷⁴ Frontier Economics & Arup (2017) *Urban water regulation reform*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/reforming-urban-water.aspx>
- ⁷⁵ NSW Government (1992) *Independent Pricing and Regulatory Tribunal Act 1992*, available at: <https://www.legislation.nsw.gov.au/#/view/act/1992/39/whole>
- ⁷⁶ Hilmer, F. et al (1993) *National Competition Policy review report*, available at: <http://ncp.ncc.gov.au/pages/overview>
- ⁷⁷ Armstrong, I. & Gellatly, C. (2008) *Report of the independent inquiry into secure and sustainable urban water supply and sewerage services for non-metropolitan NSW*, available at: <http://trove.nla.gov.au/version/45678186>
- ⁷⁸ NSW Department of Water & Energy (former) (2007) *Best-Practice Management of Water Supply and Sewerage Guidelines*, available at: <http://www.water.nsw.gov.au/urban-water/country-town-water/best-practice-management>
- ⁷⁹ Armstrong, I. & Gellatly, C. (2008) *Report of the independent inquiry into secure and sustainable urban water supply and sewerage services for non-metropolitan NSW*, available at: <http://trove.nla.gov.au/version/45678186>
- ⁸⁰ NSW Department of Primary Industries Water (2016) *Local water utilities*, available at: <http://www.water.nsw.gov.au/urban-water/local-water-utilities>
- ⁸¹ NSW Government (1993) *Local Government Act 1993*, available at: <https://legislation.nsw.gov.au/~/-/view/act/1993/30/full>
- ⁸² Frontier Economics (2014) *Improving economic regulation of urban water: A report prepared for the Water Services Association of Australia*, available at: <https://www.wsaa.asn.au/publication/improving-economic-regulation-urban-water>
- ⁸³ Water Services Association of Australia and Infrastructure Partnerships Australia (2015) *Doing the important, as well as the urgent: Reforming the urban water sector*, available at: <https://www.wsaa.asn.au/publication/doing-important-well-urgent-reforming-urban-water-sector>
- ⁸⁴ Victorian Essential Services Commission (2016) *2018 Water pricing review*, available at: <http://www.esc.vic.gov.au/document/water/36646-2018-water-price-review-guidance-paper-november-2016/>
- ⁸⁵ Armstrong, I. & Gellatly, C. (2008) *Report of the independent inquiry into secure and sustainable urban water supply and sewerage services for non-metropolitan NSW*, available at: <http://trove.nla.gov.au/version/45678186>

- ⁸⁶ AECOM (2011) *Review of regional water quality & security*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/Report-from-the-Regional-Towns-Water-Quality-and-Security-Review-Vol1-Oct-2010.aspx>
- ⁸⁷ WA Water Corporation (2016) *Drinking water quality annual report 2015-16*, available at: <https://www.watercorporation.com.au/about-us/our-performance/drinking-water-quality>
- ⁸⁸ NT Power and Water Corporation (2017) *Annual drinking water quality report 2016*, available at: http://www.powerwater.com.au/news_and_publications/reports/water_quality_reports
- ⁸⁹ Infrastructure Australia (2016) *Australian infrastructure plan*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/Australian-Infrastructure-Plan.aspx>
- ⁹⁰ Natural Health and Medical Research Council (2011) *Australian drinking water guidelines: Updated October 2017*, available at: <https://www.nhmrc.gov.au/guidelines-publications/eh52>
- ⁹¹ Western Australian Auditor General (2015) *Delivering essential services to remote aboriginal communities*, available at: <https://audit.wa.gov.au/reports-and-publications/reports/delivering-essential-services-remote-aboriginal-communities/>
- ⁹² Shine, R. (2016) 'High nitrate levels in some WA water supplies could cause kidney disease, doctor warns,' *ABC news*, available at: <http://www.abc.net.au/news/2016-06-28/kidney-disease-in-wa-communities-linked-to-nitrates-in-water-su/7551852>
- ⁹³ Jeffries-Stokes, C. (2017) *The Western Desert Kidney Health Project*, available at: http://research-repository.uwa.edu.au/files/14204754/THESIS_DOCTOR_OF_PHILOSOPHY_JEFFRIES_STOKES_Christine_Andrea_2017.pdf
- ⁹⁴ NT Power and Water Corporation (2017) *Annual drinking water quality report 2016*, available at: http://www.powerwater.com.au/news_and_publications/reports/water_quality_reports
- ⁹⁵ New Zealand Department of Internal Affairs (2017) *Government inquiry into Havelock North drinking water report*, available at: <https://www.dia.govt.nz/Government-Inquiry-into-Havelock-North-Drinking-Water-Report---Part-1---Overview>
- ⁹⁶ Independent Pricing and Regulatory Tribunal (2016) *Final report: Review of prices for Sydney Water Corporation from 1 July 2016 to 30 June 2020*, available at: <https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Review-of-prices-for-Sydney-Water-Corporation-from-1-July-2016/14-Jun-2016-Final-Report/Final-Report-Review-of-prices-for-Sydney-Water-Corporation-From-1-July-2016-to-30-June-2020>
- ⁹⁷ National Water Commission (2011) *Urban water in Australia: Future directions 2011*, available at: <http://pandora.nla.gov.au/pan/123802/20141214-0001/archive.nwc.gov.au/library/topic/urban/future-directions.html>
- ⁹⁸ National Water Commission (2011) *Competition in the urban water sector: Waterlines 42*, available at: <http://pandora.nla.gov.au/pan/139145/20130318-1530/archive.nwc.gov.au/library/waterlines/42.html>
- ⁹⁹ Productivity Commission (2011) *Australia's urban water sector: Inquiry report*, available at: <https://www.pc.gov.au/inquiries/completed/urban-water/report>
- ¹⁰⁰ National Water Commission (2011) *Competition in the urban water sector: Waterlines 42*, available at: <http://pandora.nla.gov.au/pan/139145/20130318-1530/archive.nwc.gov.au/library/waterlines/42.html>
- ¹⁰¹ Productivity Commission (2011) *Australia's urban water sector: Inquiry report*, available at: <https://www.pc.gov.au/inquiries/completed/urban-water/report>
- ¹⁰² NSW Department of Primary Industries Water (2016) *Local water utilities*, available at: <http://www.water.nsw.gov.au/urban-water/local-water-utilities>
- ¹⁰³ Economic Regulation Authority Western Australia (2013) *Water, wastewater and irrigation performance report 2012*, available at: <https://www.erawa.com.au/water1/water-licensing/performance-reports>
- ¹⁰⁴ Productivity Commission (2011) *Australia's urban water sector: Inquiry report*, available at: <https://www.pc.gov.au/inquiries/completed/urban-water/report>
- ¹⁰⁵ Productivity Commission (2005) *Review of National Competition Policy arrangements: Inquiry report*, available at: <http://www.pc.gov.au/inquiries/completed/national-competition-policy/report>
- ¹⁰⁶ Productivity Commission (2005) *Review of National Competition Policy arrangements: Inquiry report*, available at: <http://www.pc.gov.au/inquiries/completed/national-competition-policy/report>
- ¹⁰⁷ Harper, I. et al (2015) *Competition policy review: Final report*, available at: <http://competitionpolicyreview.gov.au/final-report/>
- ¹⁰⁸ Harper, I. et al (2015) *Competition policy review: Final report*, available at: <http://competitionpolicyreview.gov.au/final-report/>
- ¹⁰⁹ Australian Government (2016) *The Australian Government's response to Infrastructure Australia's Australian Infrastructure Plan*, available at: https://infrastructure.gov.au/infrastructure/publications/index.aspx#anc_response-aip
- ¹¹⁰ AECOM (2011) *Review of regional water quality & security*, available at: <http://infrastructureaustralia.gov.au/policy-publications/publications/Report-from-the-Regional-Towns-Water-Quality-and-Security-Review-Vol1-Oct-2010.aspx>
- ¹¹¹ Eaufrance (2017) *Observatoire des services publics d'eau et d'assainissement: Panorama des services et de leur performance* [Examination of public water and sanitation services: Overview of services and their performance], available at: <http://www.services.eaufrance.fr/panorama/rapports>
- ¹¹² Australian Water Association (2015) *State of the water sector report 2015*, available at: http://www.awa.asn.au/documents/SOTWS2015_Report_PRINT.PDF
- ¹¹³ Productivity Commission (2017) *National water reform: Terms of reference*, available at: <http://www.pc.gov.au/inquiries/current/water-reform/terms-of-reference>



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