

Chapter 2

Water Pricing in Australia: Unbundled Politics, Accounting, and Water Pricing

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Abstract This chapter presents a review of water-pricing arrangements in each of Australia's state jurisdictions. The pricing approaches for urban, environmental, and rural (i.e., agricultural) water uses are scrutinized and compared against the ambitions established as part of the National Water Initiative (NWI). While the framework for water pricing in the NWI has been generally deployed in most states, local nuances give rise to quite different price outcomes. Moreover, there is still opportunity for political influences to shape water prices, even though the NWI is committed to full-cost recovery with regulatory oversight that seeks to objectively align costs and prices. We conclude that there remains scope for improvement that would remove artificial differences in the way water is priced for different water users and thus support the distribution of water to its highest values.

Keywords Australia • Urban water pricing • Rural water pricing • Environmental water pricing • Sewage charges

2.1 Introduction

All Australian state jurisdictions agreed on water-pricing reforms in the 1990s and reaffirmed their commitment to the principle of cost-reflective pricing, along with enhanced institutional arrangements for managing water in the early 2000s in the form of the National Water Initiative (NWI). Similarly, in 2010, jurisdictions confirmed their commitment to the NWI pricing principles via the agreement signed by the National Resource Management Ministerial Council (DAFF and DEWHA 2010). Regardless of the apparent enthusiasm for pursuing common goals in water pricing, each state has followed different reform trajectories. Partly, these differences reflect historical institutional arrangements, but hydrology also varies between and within states, and this has also led to discrepancies. The political will to pursue

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efficient water prices has also varied across jurisdictions and over time. For instance, severe water shortage experienced as part of the extended drought in the first decade of the 2000s played an important part in shaping different approaches to water pricing, albeit supposedly within a common national framework. The impacts on water planning and the effect on water prices from these interventions have now resulted in marked divisions between the ways urban, rural, and environmental water users are charged in many jurisdictions.

The Australian experience with water pricing is thus informative, because it offers insights into how a common national water-pricing framework can still give rise to very different outcomes for water users. The experience also highlights the difficulty of “staying the distance” when it comes to pursuing the efficiency goals with which the principle of cost recovery pricing is often associated. More specifically, the experience in Australia shows that even minor differences in regulation or interpretation of accounting standards can be used to pursue a range of noneconomic objectives while seemingly remaining within a national framework based on full-cost recovery (see, e.g., Pawsey and Crase 2013).

This chapter is used to explore water-pricing reforms in Australian jurisdictions. We provide a synoptic overview of water pricing across contrasting states and detail the varying regulatory arrangements, pricing structures, implementation approaches, and implications for water users. We also briefly contrast the existing water-pricing outcomes with the principles that were agreed in the national reforms in the early 2000s and restated in 2010.

The chapter itself comprises three additional parts. In the following section, we provide a broad overview of water pricing at a national level and note significant influences in this context. Section 2.3 is used to detail the status of water pricing in individual jurisdictions. In this section, we consider the pricing arrangements for urban, rural, and environmental water uses separately, in part to highlight differences. The fourth section of the chapter briefly explores some of the themes that transcend jurisdictions and the resulting price outcomes and includes some brief concluding remarks.

2.2 A National Synopsis

Australia is a federation in which constitutional control of water rests with the constituent states. Some changes have occurred with the management of water in the Murray-Darling basin, but in essence, states are responsible for any prices charged to water users. The 1980s and 1990s were a period of dramatic economic reform in Australia. International competitiveness and declining terms of trade were prominent in the minds of national governments. The general policy solutions involved increased openness to trade and a reconsideration of the role of the government generally. A series of competition reforms¹ were ushered in which included the

¹ Competition reform is a generic term that became popular in Australia in the 1980s. The notion involves a broad suite of policy changes ranging from modifications to the way banking regulation might limit international competition through to questions regarding the efficacy of state owner-

privatization of some utility services, such as telephone and in some cases electricity, and greater attention was given to prices and costs in those utilities that remained in public hands (Crase 2009).

Water is still largely managed within the public sector in each state, although the notion of corporatization also features prominently in several jurisdictions. In addition, there has been a marked expansion of contracting and market instruments in an effort to deliver greater efficiency within the sector. The advantages of better aligning prices and costs should not require detailed elucidation here. Nevertheless, in a country often typified as being the “driest on earth,” the strengthening of incentives for a more cautious use of the resource and enhanced signaling for investment were seen as clear benefits. In addition, mounting evidence about overextraction in various basins and in some aquifers provided grounds for increased attention to water pricing. To facilitate this, the national reform agenda also included a commitment from states to introduce independent economic regulation as part of price-setting arrangements.

Several additional important national reforms that impact water pricing also warrant mention. First, under the NWI, states agreed that water prices should be based, in part and wherever practical, on volumetric use. This results in clearer signals to end users about the consequences of profligate use. Second, water rights were separated from land, and trade in rights was encouraged. Accordingly, water access and use rights are now regularly exchanged between larger users, such as irrigation farmers, environmental reserve managers, and, to a lesser extent, urban bulk water suppliers. Trade can only occur when there is hydrological connectivity, and administrative and legislative arrangements are in place to support market exchange. Nonetheless, it is important to understand that there are now different “prices” for water in Australia. On the one hand, there are a set of prices that relate to the operation of water markets, which covers trade of allocations (i.e., annual water access), prices that pertain to long-term entitlements (i.e., perpetual access rights), and a range of derivatives.² On the other hand, there is a set of water prices paid by end users. These prices relate to delivery services and infrastructure access in the case of irrigators, environmental reserve managers, and bulk urban water suppliers. In the case of residential and most commercial urban users, prices also cover access to the resource itself, since urban water is not generally unbundled and traded by this group.³ Clearly, however, if charges for water access and use do not accurately reflect costs, then there will be distorting impacts in the water markets that allocate

ship of specific assets. The underling question that drove competition reform was the extent to which market competition might make Australian production uncompetitive in international settings. This is especially important because Australia is a small open economy heavily reliant on trade with the rest of the world to achieve and maintain high living standards.

²In the case of the latter, for instance, recently announced changes to federal regulations mean that formalized forward markets are now emerging (see, e.g., WaterFind 2014).

³In a small number of instances, urban water trade at the customer level arose during the prolonged drought at the beginning of the century.

bulk supplies. This matter has been addressed elsewhere (see, e.g., Crase et al. 2013b) but remains an important area requiring further analysis.

One final national “complication” in the context of water pricing relates specifically to developments in the Murray-Darling basin.⁴ The main driver of policy change in this region has been the broad acceptance that water had been excessively allocated for consumptive use and that more water was needed for environmental purposes. This led to the creation of the Commonwealth Environmental Water Holder, a national agency that is now in command of a large volume of water acquired through a combination of market purchases, infrastructure-for-water swaps, and administrative changes to water entitlements. The water held by the Commonwealth Environmental Water Holder is deployed with the aim of restoring ecological processes within the basin⁵ but there are costs associated with managing and monitoring this work. Currently, these costs are shared between the national and relevant state governments, though this remains contentious and the extent to which such costs should be passed to consumptive users is unresolved. More generally, the requirement that water prices should also cover the cost of water planning and management remains a work in progress in most jurisdictions.

2.3 Pricing Reform by Jurisdiction

We now turn to water pricing in different state jurisdictions in Australia. To reiterate, all jurisdictions are signatories to the NWI and have received funds from the federal government on the basis of the embedded commitments. In particular, states are required to have in place arrangements that promote the efficient use of water and thus align prices with costs. The range of costs recovered and the methodology for doing so is thus critical to the determination of prices faced by end users and this can vary between jurisdictions and between users within jurisdictions. The principles of cost recovery are nonetheless quite clear: there is an expectation that capital costs will be recovered, ultimately including a return to capital for many users; the user-pay principle applies; and the legitimate costs associated with water planning and management should also be met by end users. In this section, we draw heavily on the National Water Commission’s (NWC) (2011) review of water pricing but supplement this with more contemporary detail where appropriate. We provide a brief description of each state to contextualize the price-setting processes and outcomes.

⁴Detailed descriptions of the policy activity within the Murray-Darling basin are available elsewhere (see, e.g., Crase 2012).

⁵This is not to say that the environmental ills of the basin have been “cured.” Rather, the political solution for the time being involves a plan to deliver additional water and to achieve environmental restoration. This will undoubtedly be the source of additional political maneuvering as the basin plan is progressively implemented.

2.3.1 *New South Wales*

New South Wales (NSW) is Australia's most populous state (7.4 million) but, as with most jurisdictions, the population is concentrated in the coastal region close to the capital city (Sydney) (ABS 2013). Accordingly, the population is settled mostly east of the Great Dividing Range while west of the divide lies the Murray-Darling basin. NSW is a relatively large state by land area, comprising around 800,000 km², and the western portion of the state is generally arid and sparsely settled (Geoscience Australia 2010).

2.3.1.1 Urban Water Pricing

Urban water and sewerage services in metropolitan areas are provided by three state-owned metropolitan water utilities. The Sydney Catchment Authority manages bulk supplies to the Greater Sydney region with Sydney Water then fulfilling retail functions for residents within this area. Hunter Water operates to the north of Sydney, undertaking both bulk and retail functions for residents of Newcastle and proximate towns and cities. Water and sewerage prices are subject to economic regulation for these entities on the basis that they are monopolies, and rents and gold plating need to be kept in check. Economic regulation is undertaken by the Independent Pricing and Regulatory Tribunal (IPART), which also ensures license compliance.⁶ Importantly, price determinations are binding, although the scope of the tribunal is determined by legislators.

The price-setting arrangements in these instances are built around entities producing sets of detailed plans for future infrastructure along with estimates of operating and maintenance expenditures and demand. IPART employs the long-run marginal cost (LRMC, sometimes called building-block) methodology. LRMC aims to estimate the cost of providing an extra unit of consumption, based on bringing forward the future capital program to efficiently balance supply and demand. On the basis of these costs, an entity's revenue requirement is set and then matched against anticipated demand. Because the NWI includes a commitment to two-part tariffs, with a volumetric charge signaling the impact of use, the estimate of demand forms a key part in determining the adequacy of the actual revenue received. Initially, Sydney Water opted for an inclining block tariff accompanied by a fixed fee, but this has now been simplified to a two-part tariff with a single volumetric charge, which also has economic efficiency advantages (for an explanation of alternative water tariff arrangements, see Crase et al. 2007).

Most residential customers face a fixed sewerage charge, based on the nature of their dwelling (i.e., stand-alone house versus unit or flat) largely because sewage is

⁶The tribunal also has the power to determine the prices charged by Gosford and Wyong Shire Councils, north of Sydney, and the water-related services of Country Energy in Broken Hill, located in the far west of the state.

not metered. Commercial customers face trade-waste charges set in line with the volume and level of contaminants in waste. In this instance, the volumes and constituents of waste are metered and monitored. The volumetric charge for water use is similar for most commercial purposes, although the fixed charge varies with the size of the water inlet to properties. Differential charges apply in some residential areas where water-recycling infrastructure has been put in place to provide non-potable water for gardens and other fit-for-purpose uses. Charges for using this alternative supply are set below potable water, primarily justified on the basis of the avoided costs associated with deferred potable supply augmentation (IPART 2011a). The average water prices paid by residential customers in selected locations in NSW appear in Table 2.1, along with details of pricing structures for a sample of large utilities in other jurisdictions.

A key driver of prices charged by regulated water utilities is the asset base associated with water and sewerage services and the cost of capital. In NSW, this requires an estimate of the regulatory asset base (RAB) for each business.⁷ The initial RAB set for each business followed the “line-in-the-sand” process common when existing entities first enter a regulatory regime. Additions to the RAB should seemingly be straightforward thereafter, with only efficient capital expenditures approved and added to the base, but this is not always the case.

During the extended drought at the beginning of the twenty-first century, the NSW government intervened in several large infrastructure investments, thereby overriding the regulatory process. A desalination plant was constructed at Kurnell, and the Sydney Desalination Plant was established as a wholly owned subsidiary of Sydney Water. The costs of the desalination plant were thus initially reflected in the asset base of Sydney Water; however, a range of operating scenarios were subsequently investigated by IPART as dam inflows reduced the need for the plant to operate continuously (IPART 2011b). Subsequently, a change of government saw the desalination plant leased to private interests for 50 years, such that the leasing payments now form part of Sydney Water’s operating costs (Malone 2013). The point is that arm’s length economic regulation in NSW does not completely isolate the regulator from the preferences of legislators.

Government influence over water prices is arguably more overt in the entities not directly subjected to economic regulation by IPART. Water and sewerage services are provided by local governments outside the “regulated” metropolitan areas of NSW. There are around 100 of these local water utilities (LWUs) with each being “regulated” by a best-practice management framework administered by the NSW Office of Water. While entities regulated by IPART have been required to achieve what is known as “upper-bound” pricing, which involves a return to capital in addition to depreciation, the evidence on returns achieved by LWUs is mixed. For example, the NWC (2011, p. 27) noted that the proportion of LWUs in NSW generating a positive rate of return actually fell between 2005–2006 and 2008–2009

⁷The weighted average cost of capital and the chosen depreciation methodology are also major influences on costs. We highlight instances of the importance of these in our discussion of other jurisdictions.

Table 2.1 Example 2012/2013 tariff structures and charges

Area	Utility	Tariff structure	Fixed charge	Step usage charge/s (\$/kl)	Annual bill ^a
ACT	ACTEW	Two-part tariff with 2-step inclining block	99.83	2.43 4.86	585.83
NSW	Hunter Water Corporation	Two-part tariff	18.92	2.08	434.92
	Sydney Water Corporation	Two-part tariff	135.12	2.13	561.12
	Wyong Shire Council	Two-part tariff	167.40	2.12	606.00
NT	Power and Water – Darwin	Two-part tariff	263.71	1.73	609.71
QLD	Gold Coast City Council	Two-part tariff	201.50	3.27	855.34
	Townsville Water	Standard plan ^b	681.00		681.00
	Toowoomba Regional Council	Two-part tariff with 2-step inclining block	590.00	2.10 3.30	1010.00
	Unitywater	Two-part tariff with 3-step inclining block	292.97	2.37 3.04 3.50	746.09
	Queensland Urban Utilities	Two-part tariff with 3-step inclining block	167.16	2.72 2.76 3.32	733.29
SA	SA Water – Adelaide	Two-part tariff with 3-step inclining block	293.00	2.42 3.45 3.73	897.40
VIC	Barwon Water	Two-part tariff	168.32	2.21	611.00
	City West Water	Two-part tariff with 3-step inclining block	170.40	1.79 2.10 3.10	543.41
	Coliban Water	Two-part tariff with 3-step inclining block	97.84	1.95 2.36 3.90	500.00
	South East Water Ltd	Two-part tariff with 3-step inclining block	82.44	1.75 2.13 3.44	452.00
	Western Water	Two-part tariff with 3-step inclining block	215.26	1.38 1.84 3.67	514.00
	Yarra Valley Water	Two-part tariff with 3-step inclining block	120.26	1.78 2.08 3.08	488.00
WA	Water Corporation – Perth	Two-part tariff with 3-step inclining block	188.10	1.34 1.75 2.40	475.85
TAS	Cradle Mountain Water	Two-part tariff	384.49	0.90	564.49

Modified from National Water Commission (2014a, b)

^aBased on 200 kL of residential water supplied

^bRefer to section 2.3.3.1 for further detail

and the average return stood at only 0.6 %. In contrast, the rates of return set by IPART are usually around 6–7 %, with the state government being the beneficiary of these returns.

2.3.1.2 Rural Water Pricing

In Australia, the term “rural” water pricing relates to the charges imposed on irrigators, although in some jurisdictions, rural water agencies also provide bulk water to urban retailers. Many of the larger irrigation supply organizations in NSW are located in the Murray-Darling basin, and ownership and management of these entities was devolved to farmers during reforms of the 1990s. A key component for water prices paid by irrigators is the charges set for the delivery of water to the irrigation district, where it is then controlled by the irrigation infrastructure operator (IIO). In NSW, responsibility for the delivery of bulk water for irrigators resides with State Water Corporation, which initially had its charges regulated by IPART (see IPART 2010) but is currently regulated by the Australian Competition and Consumer Commission (ACCC). The methodology for estimating efficient costs is broadly similar to that applied for urban utilities, although the movement toward “upper-bound” pricing has been slower for this sector. Charges comprise a fixed fee, based on entitlement type, the valley where the entitlement is held, and the size of entitlement plus a variable charge.

A key difference in rural water pricing in NSW has been the significant progress made to isolate costs related to water planning and water management. These charges are also subject to independent review and, unlike neighboring jurisdictions, are specifically recovered from end users. Arrangements for cost recovery precede the ACCC’s assumption of responsibilities for economic regulation in the Murray-Darling basin. For an environment in which water can be traded between jurisdictions, differences in charging regimes have been a source of contention between states, although the NWC (2011, p. 38) noted that the opportunity cost of water is the main determinant of farmer behavior rather than differences in bulk water charges.

Charges levied by State Water Corporation form the foundation of prices paid by farmers, but additional costs also derive from IIOs. As part of recent reforms in the Murray-Darling basin, the ACCC assumed additional responsibilities for monitoring and regulating prices charged by IIOs.⁸ An important task of the ACCC was to establish prices and rules that related to irrigators selling their water entitlements to others outside the area controlled by an IIO. Initially, IIOs had imposed exit fees on these farmers, but the basis of those fees was considered to unfairly act against trade. The upshot was that water entitlements were further unbundled and delivery entitlements identified.

⁸This is limited to larger ISOs and those not subject to regulation by accredited regulators. The form of regulation is arguably more “light-handed” than that applied by IPART.

Delivery entitlements constitute a right to access irrigation infrastructure with a specified delivery capacity. Irrigators now have the option of selling water access entitlements and maintaining delivery rights or “shares,” which in turn attract an annual charge. Alternatively, farmers can terminate their delivery shares and IIOs are constrained to charging no more than ten times the annual delivery share charges. These funds aim to compensate remaining irrigators for the increased cost of maintaining a network.

The annual prices paid by individual irrigators in NSW vary greatly in their complexity. For those irrigators not part of a communal scheme (i.e., pumping directly from rivers or aquifers), the charges levied by State Water Corporation and private pumping expenses represent the only pertinent costs. Farmers serviced by an IIO can expect to face account administration charges, delivery entitlement fees, fees related to outlets, drainage fees, standard water-use fees, and casual water-use fees (in which a premium is paid for exceeding an allocated entitlement).

Given that ownership of IIO assets was principally vested in private hands in NSW, the scope for gaining ongoing rents from government might be expected to be limited. However, the impacts of drought coincided with expanded government enthusiasm to reduce extractions in the Murray-Darling basin in the early 2000s, and this has placed at risk the cost recovery principles agreed in the NWI. The Commonwealth and, to a lesser extent, the NSW government, have undertaken so-called irrigation infrastructure renewal as part of a wider program to deliver more water for environmental purposes. The accounting that relates to these investments and the deflating impacts on prices paid by irrigators is important but potentially less problematic in NSW than for other jurisdictions in which IIOs remain in public hands.

2.3.1.3 Environmental Water Pricing

To understand the prices paid for environmental water, it is important to distinguish the different forms. First, some water is held by state agencies for environmental purposes and is based on the operating rules for regulated streams. This is often called “rule-based” water. For example, a volume of water might be held in storage for servicing a wetland and released, subject to downstream flow parameters being reached. Generally, this type of environmental water is not subject to management fees. Second, separate volumes of water have been acquired by environmental agencies that were previously assigned to consumptive uses. This is often called “held” water. The rules that govern water trade in the Murray-Darling basin mean that this second form of “e-water” carries similar costs and constraints that attended the rights when held in private hands. Accordingly, the environmental agency that owns e-water must also meet the statutory charges imposed by State Water Corporation in the storage and release of that water. The agency that “owns” most e-water on behalf of NSW is known as RiverBank, although the holdings of the Commonwealth Environmental Water Holder vastly outstrip those secured by RiverBank, meaning the

Commonwealth is obliged to pay fees and charges to NSW State Water Corporation for its e-water holdings.

RiverBank has historically reduced some of its water management costs by trading the allocations that accrue to e-water when it is deemed surplus to environmental need (DECCW 2010), and this approach is now being tentatively pursued by the Commonwealth.

2.3.2 *Victoria*

Victoria is Australia's second most populous state (5.8 million) but covers a much smaller land area than NSW (around 230,000 km²) (ABS 2013; Geoscience Australia 2010). Like NSW, the capital city (Melbourne) is densely settled—by Australian standards—and enjoys a coastal location. The metropolitan area is also separated from the Murray-Darling basin and lies south of the Great Dividing Range, although some hydrological connectivity exists since the construction of pipeline linking Melbourne to the irrigation water supplies in the north of the state.

2.3.2.1 **Urban Water Pricing**

The institutional arrangements for urban water pricing share some similarities with those described for NSW, but there are also important differences. First, all of Victoria's urban water suppliers are in the form of water corporations owned by the state government, not simply those in metropolitan areas. In the metropolitan area, Melbourne Water undertakes responsibilities for bulk water supply and bulk sewerage services and also manages the drainage systems in the regions. Retail water and sewerage services in the metropolitan area reside with three entities—South East Water, Yarra Valley Water, and City West Water. An additional 13 regional water utilities operate outside the metropolitan area, many controlling their own bulk water supplies. All urban entities are subject to economic regulation and must have water plans approved by the Essential Services Commission (ESC), which manifests in price determinations lasting 5 years.

Second, like IPART, the ESC favors the building-block approach when reviewing water and sewerage prices, but the establishment of the RAB and related parameters differ in some instances. To illustrate the importance of these differences, we briefly examine the alternative principles that circumscribe asset valuations for water utilities within Victoria. The minister for water initially set the RABs of urban water businesses in 2004. Consistent with their designation as “for-profit businesses,” the RABs of metropolitan businesses were initially set above the corresponding statutory values. By comparison, the RABs of the 13 “not-for-profit” regional urban water businesses were initially set below statutory values (Pawsey and Crase 2014).

Unsurprisingly, given the different approach taken in establishing opening RABs, the financial performance of metropolitan and regional urban businesses has been

contrasting. As reviewed by Pawsey (2014), over the period 2005/2006–2012/2013, the average annual before tax profits of all metropolitan water businesses exceeded \$A50 million.⁹ These reported profits permitted metropolitan water businesses to return a total of \$A1.3 billion in dividend payments and \$A774 million in income tax payments to the state. By comparison, over the same period, only two regional urban businesses had an average annual before tax profit of more than \$A5 million, and many reported average before tax losses. Furthermore, only three regional urban water businesses made any dividend and/or income tax payments to the state.

Notwithstanding these differences, all Victorian urban water utilities are reported as being “substantially compliant” with the notion of “upper-bound” pricing (NWC 2011, p. 25). But it is difficult to reconcile the stark differences between the treatment of metropolitan consumers and regional/rural urban water users. One of the basic tenets of LRMC pricing is that infrastructure augmentation should occur on the basis of economic merit. Put simply, economic regulation should ensure that the most cost-effective augmentation works are supported first. This has been broadly true for regional utilities in Victoria but is not the case for Melbourne. For example, the pipeline that links Melbourne with irrigation water north of the divide was constructed at the height of the drought and now represents low-cost water for Melbournians. However, in November 2012, it was announced that the pipeline could only be used to boost Melbourne’s water supply during times of “critical human need,” and this was defined as a period when water storage is below 30 % on 30 November (Office of Living Victoria 2013, p. 14).¹⁰ It is worth noting that the commissioning of the desalination plant in Wonthaggi in 2012 means that the minister for water is at liberty to order up to 150 GI of water in April of any year, implying that the “30 % at 30 November” dam threshold will likely be met in all but the most extraordinary years (Crase et al. 2014b).

Interventions like these bring into question the extent to which arm’s length economic regulation can lead to efficient pricing outcomes in metropolitan Victoria. Similarly, in January 2014, the minister for water announced that the government would undertake a review of water prices even though the economic regulator completed its price determinations the previous year. The review titled “Fairer Water Bills” was launched leading up to the state election and included a commitment to “lower water bills in future despite labor’s [i.e., the previous government’s] legacy of waste and mismanagement” (Walsh 2014, p. 1). An integral component of the “Fairer Water Bills” initiative is a strong commitment to foster integrated urban water management, the costs and benefits of which have not been publicly tested. It is not clear the extent to which the ESC will be given responsibility for regulating price increases should they be deemed necessary after the election.

One of the major achievements of the ESC in its recent round of determinations has been to engender greater innovation among water retailers in tariff design. The fact that there are three retailers in Melbourne has encouraged a sense of competi-

⁹ \$A1 = \$US0.91 in September 2014. Throughout most of the last decade, the Australian dollar varies from close to parity with the \$US to about \$US0.9.

¹⁰ There is also a minor provision to draw water from the pipeline for firefighting purposes.

tion by comparison and this has recently shifted focus onto customer satisfaction and value. Thus, while retailers continue to offer water charges that comprise a fixed service fee and a volumetric tariff based on use,¹¹ there is considerable experimentation on this front. For example, Yarra Valley Water announced in April 2014 that it would pilot a “volumetric-only” tariff for customers wishing to engage in the trial (YVW 2012). The motivation for the pilot appears to be discontent among some customers that radical reductions in their household water use in response to conservation messages from government had yielded only modest financial savings.

2.3.2.2 Rural Water Prices

Unlike NSW, Victoria’s irrigation infrastructure largely remains in public hands. Bulk water is supplied by several government-owned corporations, some of which also act as IIOs. Goulburn-Murray Water is the largest of these entities and provides bulk water and irrigation services in the north of the state. Prices set by Goulburn-Murray Water (and other state-owned IIOs) are subject to economic regulation by the ESC and, as with most water businesses, are heavily influenced by the asset base, as measured by the RAB. The opening RABs of rural water businesses were, however, initially set in 2004 at zero by the minister for water (VAGO 2013). Similarly, the so-called gifting of assets (i.e., government-subsidizing infrastructure provision) creates an additional long-term conundrum for generating even lower-bound prices.

We noted that in NSW, the Commonwealth and state governments had embarked on programs that subsidized irrigation infrastructure upgrades, in part to secure water access for environmental ends. This approach has been particularly prevalent in Victoria, where Goulburn-Murray Water has been the beneficiary of around \$A2 billion of public investment in recent years (Craser et al. 2013a). Setting aside the cost of this policy approach and the potential for miscalculating water savings¹² (see Perry 2009), the impact on current prices paid for water services and the long-term consequences of underfunding are of concern. Since infrastructure that is “gifted” by government does not add to the RAB, it follows that insufficient monies are currently being collected to fund the depreciation of those gifted assets, let alone generate a positive rate of return.

¹¹ Two of the retailers offer an inclining block tariff, while the other employs a single-step usage rate.

¹² One of the major challenges with this policy approach is that it potentially double-counts water savings. In Australia, this is further complicated by the way irrigation entitlements are specified as “gross” entitlements that take little account of the impacts of return flows on downstream users. Thus, when a farmer “saves” water by increasing localized water-use efficiency, there is a real risk that other existing beneficiaries are deprived of water. Ironically, this stands to undermine efforts to improve environmental outcomes inasmuch as environmental water uses are often third-party recipients of “inefficient” irrigation practices.

The management of Goulburn-Murray Water has been cognizant of the emerging challenges on this front and, in 2013, set about to reform its complex tariff regime and establish prices that better captured the benefits of the new infrastructure.¹³ However, there is much ground to be made up, and Pawsey and Crase (2013) estimate that prices would need to increase by about 300 % to achieve upper-bound pricing.

2.3.2.3 Environmental Water Pricing

Victoria has access to both rule-based and “held” water, with the latter vested in the Victorian Environmental Water Holder (VEWH). Operations of the VEW in the Murray-Darling basin are subject to the same conditions as those described for NSW.

As part of the irrigation infrastructure renewal projects in northern Victoria, some marginal irrigation networks were closed. For example, the Campaspe system was decommissioned and, together with the Commonwealth, the VEW now holds most entitlements on that system. Peculiarly, both environmental water holders now find themselves paying fees for dam managers to release water in a manner that replicates the absence of the dam.

At a broader level, Victoria has been criticized by the NWC for failing to adequately establish the costs of water planning and management and attributing these to users (NWC 2011). Rather, the Victorian water utilities impose a so-called environmental contribution, which is set at 5 % of revenue for all urban water utilities and about half that for rural water utilities. Funds are appropriated as general revenue for the state. In metropolitan areas, a “park-and-garden” charge is also directly levied on water users and distributed to Melbourne Water for the management of waterways, the Botanic Gardens and Parks Victoria, which manages environmental and recreation sites near Melbourne.

2.3.3 Queensland

Queensland (Qld) is a large state with a land area in excess of 1.7 km². It has considerable climatic variation with tropical climates in the north and subtropical climates in the south. The inland is much dryer than coastal areas, and the southwestern portion of the state lies within the Murray-Darling basin. The population (4.7 million) is heavily concentrated in the southeast corner, near Brisbane and the Gold Coast, which continues to grow rapidly, in part from migration from other states (ABS 2013; Geoscience Australia 2010).

¹³A detailed assessment of farmer responses to tariff reform in this context is available at Crase et al. (2014a).

2.3.3.1 Urban Water Pricing

Like NSW, the pricing of urban water varies with the institutional backdrop, which is, in turn, determined by proximity to the metropolitan region. In the metropolitan areas that occupy Brisbane and the Gold Coast, an entity known as SEQ Water provides bulk water, while retail services are provided by local governments in the region. During the drought in the early 2000s, the Queensland and Commonwealth governments constructed a “water grid,” which included a desalination plant and connectivity between remote storages. In 2008, the state government committed to price increases in bulk water to reflect these costs, but they were to be phased in over 10 years. Bulk water is charged on a volumetric basis only and appears separately on water users’ accounts. Subsequently, the state government adjusted the price path such that different councils will meet full-cost recovery for bulk water at different times (DEWS 2014, p. 1). The shortfall in revenue is funded by SEQ Water debt, and while these arrangements are transparent, the NWC notes that the outcome is “inconsistent with Queensland’s commitment to implement upper-bound pricing in metropolitan areas” (NWC 2011, p. 24).

Similar inconsistencies with the intent of the NWI are evident in the tariff regimes deployed by local governments with different rates applied to “business” customers and residential users. Sewerage charges are based on fixed access fees, and water charges comprise a fixed fee and a three-tier inclining block tariff.

The bulk water charges are subject to economic oversight via the Queensland Competition Authority (QCA), although its rulings are not binding and stand as recommendations to government. Retail charges are simply “monitored” by the Authority “to assess whether households and businesses are paying a price that is comparable with the costs of providing the relevant services” (QCA 2014, p. 1).

Beyond southeastern Qld, a further 71 “water service providers” deliver water and sewerage services to urban areas. Most of these (62) are local governments (NWC 2013, p. 149) and most administer a two-part tariff, including a component that reflects consumption. Townsville, in northern Qld, was noted by the NWC (2011, p. 29) as one of the remaining water providers that had not moved to consumption-based pricing and retained a water “allowance” per property. The NWC further noted that attempts to introduce a uniform two-part tariff resulted in some community opposition and the Qld government then advised the local government that it was not required to adjust its tariff regime. In 2014–2015, households in Townsville paid a standard fee of around \$A700 per annum and were permitted to use up to 772 kl¹⁴ before attracting a volumetric charge (Townsville City Council 2014, p. 1). The NWC (2011, p. 29) noted that “this example highlights a lack of commitment to the principle of pricing reform and a lack of enforcement powers at the state or national level.”

¹⁴A kiloliter is one cubic meter.

2.3.3.2 Rural Water Pricing

Qld has two government-owned entities involved in the distribution of irrigation water and irrigation services. Both are subjected to economic oversight by the QCA although, again, recommendations are not binding on government. QCA's pricing reviews cover a 5-year period, and irrigation prices are presently set for 2012–2017. SunWater provides water to regional interests (including mining), while SEQ Water also services nonurban customers, notably irrigators, in southeastern Qld.

In the most recent price reviews undertaken by QCA, the government directed that prices be established that “reflect efficient operational, maintenance and administrative costs, and prudent and efficient expenditure on renewing and rehabilitating existing assets through a renewals annuity. Prices are to exclude dam safety and metering upgrade costs related to changes in national standards, and any rate of return on existing assets” (QCA 2013, p. xxi). The government also directed that while irrigation prices would likely break even with lower-bound pricing, any shortfall would be “expected to be paid by government in the form of a community service obligation (CSO)” (QCA 2013, p. xxi).

During the drought, the Qld government introduced fixed-charge drought-relief measures, but the most recent recommendations from QCA have been accepted by government and allow for a transition to a two-part tariff. Collectively, these revenues are expected to generally match lower-bound costs. The fixed component of charges approximates about 90 % of the revenue, although CSOs also make up a substantive contribution to revenue.

2.3.3.3 Environmental Water Pricing

Most provisions for environmental water in Qld are in the form of rule-based allocations. These are detailed in water resource management plans. The costs of water planning and management are purportedly embedded in the prices paid by end users. Nevertheless, the NWC (2011, p. 42) noted that on a statewide basis, only about 5 % of the costs associated with water planning and management activities are recovered via end users.

2.3.4 Western Australia

Western Australia (WA) is a vast land area of around 2.5 million square kilometers and has a population of around 2.5 million, mostly located in the southwest near the capital city, Perth (ABS 2013; Geoscience Australia 2010). The southwest has experienced marked declines in rainfall over the past three decades (CSIRO 2005). The metropolitan region has historically been heavily reliant of groundwater supplies, and Perth now has two desalination plants. Inland areas of the state are generally arid, the north is tropical and subtropical, and the southwest is temperate.

2.3.4.1 Urban Water Pricing

Almost all urban water supplies, sewerage services, bulk water, and irrigation are administered through a single government-owned entity, the WA Water Corporation. Two additional entities, the Bunbury and Busselton Water Board, are self-funded statutory authorities that provide water and sewerage services to their district populations, south of Perth. Historically, WA had applied postage stamp pricing for water services across the state. More recently, an attempt has been made to divide nonmetropolitan towns into classes, based on the cost of extracting, treating, and distributing water. There are five classes of town across the state and a single-tariff regime for the metropolitan area (Water Corporation 2014).

Water tariffs comprise a fixed service fee and a variable, three-tier inclining block component based on usage. Sewerage tariffs are based on the gross rental value of properties, and a minimum amount is set for metropolitan users, while an upper and lower bound applies in country areas.

Tariffs are subject to economic oversight by the Economic Regulation Authority (ERA), although its recommendations must be approved by the government.

2.3.4.2 Rural Water Pricing

Irrigation activity in WA is restricted to the southwest (Harvey Water Irrigation Area; Preston Valley Irrigation Cooperative) and the far northwest (Ord Irrigation Cooperative; Gascoyne Water Cooperative). The older of these entities were vested in farmers as part of the reforms in the late 1990s, and fees and charges are levied on members/owners. The tariff structure in the Ord comprises a flat fee, partially based on land area, and a single volumetric fee, although a surcharge applies if pumping is required (Ord Irrigation 2014). Harvey Water tariffs are more complex, in part because it must recoup funds from users to pay the Water Corporation for storage and dam safety services. Payment for these services is included within the fixed component of fees, as is a surcharge for access to pressurized supply via a pipeline. A variable charge also applies and is based on volumetric use.

The ERA has oversight of prices and receives a written submission on water charges from each IIO, subsequently embedding these in the operating licenses of each entity.

2.3.4.3 Environmental Water Pricing

WA does not currently specify or recoup from end users the costs associated with water planning and water management for environmental purposes (NWC 2011, p. 43). Nonetheless, in 2011, the ERA undertook a review and identified the efficient costs related to such activities and recommended that they be phased in over a 3-year period (ERA 2011). The interface between mining activities and water

resources is also contentious in this jurisdiction and remains largely a work in progress (see, e.g., Department of Water [2013](#)).

2.3.5 *South Australia*

The South Australian (SA) land area exceeds that of NSW at around 980,000 km², although the population is only about 20 % of that of NSW, at 1.7 million (ABS [2013](#); Geoscience Australia [2010](#)). Again, most residents are clustered in a zone close to the capital city, in this case Adelaide. The capital relies to some extent on water pumped from the River Murray, and the southeast corner of the state also sits within the Murray-Darling basin. The inland and western zones are generally arid.

2.3.5.1 Urban Water Pricing

Water and sewerage services are provided by a single state entity, known as SA Water. Urban water prices in SA are largely uniform across the state (i.e., so-called postage stamp pricing). The gap between cost recovery from users in regional areas and the upper-bound revenue requirement is funded by the state government as a CSO. Economic regulation of prices is vested in the Essential Services Commission of South Australia (ESCOSA), but as with Qld and WA, the determinations of the commission are not strictly binding and prices are set “with government.” Progress to distance the economic regulator from government was made in May 2013, when ESCOSA released its first “independent” determination of the maximum allowable revenues that could be collected to cover upper-bound costs¹⁵ (ESCOSA [2013](#)). However, illustrative of the pervasive influence of government in this arena, the premier and minister for water announced in the same month that rebates from water bills were to be increased for low-income earners and pensioners¹⁶ (see Weatherill and Hunter [2013](#)).

The water prices for residential customers in SA comprise a fixed charge and a usage charge that is made up of three tiers—prices increase as usage exceeds the relevant threshold (i.e., an inclining block tariff). As in NSW, some residential areas are serviced by a dual pipe system that supplies recycled water (e.g., Mawson Lakes). Consumption of this water is priced below the lowest tier for potable water (see SA Water [2014b](#)).

Business customers pay a single-usage tariff that is almost equal to the highest block tariff for residential users. The fixed component of charges for nonresidential

¹⁵The first determination covers a three-year period. The upper revenue bound in SA is made up of operating costs, depreciation, and a return on assets. The latter was set at a pretax WACC of 6 % in 2008–2009 (NWC [2011](#), p. 26) but revised to 4.5 % in the most recent determination (ESCOSA [2013](#)).

¹⁶A rebate was similarly announced a year earlier.

users is based on either a flat rate (of about \$70 per quarter) or a fraction of the land valuation, whichever is higher. Some commercial premises are also subject to trade-waste charges. The sewerage charge for residential customers in SA is based on the highest of either \$80 per quarter or a portion of the property value.

As with other jurisdictions impacted by drought in the 2000s, the SA government opted to construct a desalination plant to shore up potable supplies, with financial assistance from the Commonwealth. The Commonwealth contribution of \$328 million (Department of Environment—Commonwealth 2013) sits outside the RAB that drives water prices, and as with other desalination plants in the eastern states, the appropriate operating costs for now “month-balled” assets remain contentious (see, e.g., SA Water 2014a).

2.3.5.2 Rural Water Pricing

The majority of SA’s irrigation sector is managed through privately owned irrigation trusts. The largest of these is the Central Irrigation Trust (CIT), which manages delivery of water to ten irrigation districts via pumping infrastructure on the River Murray (DPIRSA 2013). Charges comprise a fixed service fee, based on the size of the water delivery right, and a volumetric usage fee. The usage fee varies according to time of use (i.e., peak/off-peak) and the pressure associated with delivery (i.e., low, medium, high, high lift high pressure) (CIT 2014).

As with other jurisdictions with irrigation interests in the Murray-Darling basin, SA’s irrigators have accessed public funds to upgrade infrastructure. The Private Irrigation Infrastructure Program for South Australia was nominated by the SA government as a priority project to draw monies from the Commonwealth’s Sustainable Rural Water Use and Infrastructure Program. As with irrigation entities in NSW, the gifting of capital necessarily deflates current prices, though the legacy issues are only problematic for the state to the extent that future governments offer to refurbish run-down but private assets with more public monies.

2.3.5.3 Environmental Water Pricing

SA applies a natural resource management water levy on all water license holders in the Murray-Darling basin region of the state. These charges are based on the size of water access entitlements or the allocation or use, depending on district and type of activity. In addition, the SA minister for water imposes a “Save the River Murray” levy on all customers of SA water. The levy currently sits at about \$10 per quarter for residential customers and \$40 per quarter for nonresidential customers (Department of Environment Water and Natural Resources 2013, p. 7). In updating these charges, the SA government ostensibly fulfilled its obligation under the NWI to make water planning and management costs transparent, although it is not clear that the charges have yet been subject to independent review.

2.3.6 Tasmania

Tasmania is an island state south of the mainland with a modest population of about half a million and land area of 68,000 km² (Geoscience Australia 2010). The state enjoys a cool/temperate climate and relatively high rainfall. Hydroelectricity is a major user of water.

2.3.6.1 Urban Water Pricing

Major reforms in urban water and sewerage services occurred in Tasmania in 2009, with services being delivered by three regional corporations owned by constituent local governments. Each corporation also became subject to economic regulation with the Office of Tasmanian Economic Regulation making its first independent price determination in 2012 (OOTER 2014). The initial regulatory period was for 3 years. In 2013, corporations agreed to form a single entity, TasWater, which bills customers in line with the initial price determinations in 2012.

Water tariffs aim to comprise a fixed and variable component, although metering has not yet been universally installed throughout the state. Where meters exist, users face a single tariff per kiloliter, although the charge varies with water quality. Non-potable supplies are set at about 70 % of the potable rate and when water quality declines and boil-water notices are issued, the lower rate applies. For customers with unmetered properties, prices are based on the size of the water inlet to the property. Sewerage charges are fixed and based on an estimate of equivalent tenements (TasWater 2014).

Overall, rates of return to the water utilities remain significantly below full-cost recovery. In addition, political decisions about the accounting treatment of assets undermine efforts to put the sector on a firmer footing. For example, OOTER (2014, pp. vi–vii) notes that:

In terms of the corporations' long-term financial stability, the fact that all three water and sewerage corporations have been required to adopt 'impaired' asset values means that current levels of revenue are insufficient to fund the repair and replacement of existing assets. Without increases in revenue the corporations are not financially sustainable in the long-run based on their existing assets, let alone being able to fund the significant capital expenditure required to meet environmental and public health regulatory requirements.

2.3.6.2 Rural Water Pricing

Tasmanian Irrigation Pty Ltd (TI) was established in 2011 as a state-owned enterprise with the aim of developing and managing irrigation schemes across the state. Irrigation is relatively undeveloped in this jurisdiction and state and Commonwealth governments have set aside \$220 million to progress irrigation projects. Such projects are viewed as public-private partnerships, with the private contribution

coming in the form of the purchase of tradable water entitlements within schemes. It is envisaged that lower-bound pricing will be achieved with TI (2014) noting that “[o]ngoing operating costs, including provision for asset renewal, will not be subsidized and will be met by annual charges levied on water entitlement holders.”

Prices vary between established schemes with most opting for a two-part tariff, with the fixed component based on entitlements held at the commencement of the irrigation season and the variable charge related to water delivered during the season (TI 2012a). In some instance (e.g., Lower South Esk Irrigation Scheme), a fixed charge is levied, based on entitlements and unused entitlements, and then attracts a rebate, set at about half the fixed charge, at the end of the season (TI 2012b). OOTER is restricted to urban water regulation and does not regulate irrigation prices.

2.3.6.3 Environmental Water Pricing

The NWC (2011, p. 43) noted that Tasmania specifies charges that relate to environmental water considerations, and these are paid by license holders. It is not clear if these charges have been reviewed by OOTER.

2.3.7 Australian Capital Territory

The Australian Capital Territory (ACT) is a separate jurisdiction that is circumscribed by NSW and houses the national capital, Canberra. The population, of around 380,000, is primarily urban and there are few substantive irrigation interests (ABS 2013).

2.3.7.1 Urban Water Pricing

Water and sewerage services are provided in the ACT by ACTEW, an unlisted public company owned by the ACT government. The company also operates gas and electricity distribution facilities through a joint partnership with commercial interests. The prices set for water and sewerage services are subject to economic regulation via the Independent Competition and Regulatory Commission (see ICRC 2013a). Illustrative of the challenge of regulators meeting competing goals, the commission recently modified its traditional approach to water pricing following ACTEW’s extensive capital works in the wake of the 2000s drought. Ideally, water assets should be paid for by the generation of beneficiaries, implying long-lived assets would be paid for over a long period of time. However, the price direction issued in 2013 noted that “the Commission’s analysis found that it was not possible to transfer the burden of ACTEW’s costs to future water users without an unacceptable risk to ACTEW’s financial viability.” Similarly, in order to balance the impacts of higher

prices with equity concerns, the commission opted to reduce the rate of return to the ACT government and put in place a price path toward higher rates of return in future (ICRC 2013b).

Water prices are levied as a fixed fee with a two-tier inclining block tariff applicable to water use. The water use is based on average daily consumption over the billing cycle. Sewerage charges are levied at a flat rate, based on the nature of dwellings (ACTEW 2014a).

2.3.7.2 Environmental Water Pricing

The ACT government imposes a water abstraction charge set at about \$A0.50 per kiloliter for urban use and around half this rate for nonurban uses. The charge purports to cover costs related to catchment maintenance and related government expenditure, reflect the scarcity value of water, and capture environmental effects (ACTEW 2014b).

2.3.8 Northern Territory

The Northern Territory (NT) is Australia's smallest jurisdiction by population (around 240,000) but nonetheless has an extensive land mass of 1.3 million square kilometers (ABS 2013; Geoscience Australia 2010). The NT is also home to a large portion of Australia's indigenous population, some of whom live in isolated settlements located at considerable distances from the capital, Darwin.

2.3.8.1 Urban Water Pricing

Prices for urban water are set directly by the NT government, which owns and operates the combined Power and Water Corporation. The water tariff comprises a fixed fee, based on the size of the connection or meter, and a single volumetric charge. Sewerage services are levied at a flat rate on properties with access, regardless of connection. Prices are similar for residential and commercial users. The NWC (2011, p. 25) contends that revenues were sufficient in the metropolitan area to meet lower-bound cost recovery only, although prices were increased substantially in 2012. The subsequent election of a new government saw seemingly arbitrary reductions in water and sewerage charges (see Giles 2013). The provision of water and sewerage services in remote communities is largely supported by funding from state and Commonwealth governments. The NT Power and Water Corporation operates a not-for-profit subsidiary known as Indigenous Essential Services for these purposes (PWC 2014).

2.3.8.2 Rural Water Pricing

Large-scale irrigation is uncommon in the NT, although the planned expansion of the Ord irrigation scheme in WA would see its extension into NT. Contributions to this project from Commonwealth and WA governments were announced in late 2012 (DPIF 2014).

2.3.8.3 Environmental Water Pricing

No discernible prices for environmental water have been developed in NT (see NWC 2011), and “water resources are generally considered to be under relatively little pressure due to a comparatively small population base and low intensity of land use” (DLRM 2014).

2.4 Summary and Concluding Remarks

This chapter offers a concise overview of water pricing arrangements in Australia. The analysis reveals considerable variation by jurisdiction, notwithstanding shared commitments to important principles, like full-cost recovery. Some of these differences are a manifestation of the demographic, geographic, and hydrological contexts and the institutional apparatus that matches those settings. It is simply not possible to administer identical pricing arrangements in a country with such stark variations.

Nonetheless, there are also common and sometimes worrying similarities. The proclivity for political will to wane under pressure of drought is a common theme across jurisdictions, especially evident in those states with agrarian interest in the Murray-Darling basin. The enthusiasm for political intervention to shore up urban water supplies and to circumvent planning that would lead to increased scrutiny of costs is also evident in the Australian experience of drought. In addition, it is clear that legislative arrangements that seek to establish arm’s length economic regulation cannot completely insulate against the vagaries of legislative intervention.

These trends are problematic on several fronts. First, Australia’s water reforms of the last three decades have focused heavily on ensuring economic incentives are in place that support judicious management. Water markets were introduced with the view that water would not be held in less-efficient uses and would move, over time, to deliver the greatest net benefit to society. This should have resulted in greater coherence between water allocation among the competing demands of urban users, agriculture, and environmental interests. In practice, political intervention with water pricing limits the capacity of these wider policy instruments to take hold. In simple terms, irrigators in existing communal irrigation districts are advantaged by subsidies that drive down the charges faced for water use while metropolitan water users, in particular, often pay higher-than-cost prices. The extent to which

water is bid toward environmental interests is also influenced by the manner in which “held” water attracts charges, namely, paying water prices that reflect the usefulness of the water for agriculture and not the environment. In sum, the nuances of water pricing place a constraint on the way water markets are supposed to operate.

The Australian experience also highlights areas where economic regulation of water needs additional research, especially in locations where water resource availability is so variable. The widespread use of LRMC as the basis for setting revenue requirements for utilities resulted in under-recovery of costs during drought and over-recovery during wetter years.

Nonetheless, overall Australian jurisdictions have made substantial progress to price reform in water, and the innovations now emerging in competitive environments offer at least some promise and lessons for others.

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