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Australian Urban Water Reform Story

with Detailed Case Study on New South Wales

Chris Salisbury, Brian W. Head, and Eric Groom

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Contents

Acknowledgments *xi*
Abbreviations *xiii*

Part I Australian Urban Water Reform Story **1**

Executive Summary **3**

Chapter 1 Introduction **7**

Chapter 2 History of Reforms **9**
2.1. Australian Context 9
2.2. Build and Supply Era 10
2.3. Early State-Led Initiatives 10
2.4. First Wave of National-Led Reforms 11
2.4.1. Scaling Up Urban Water Pricing 11
2.5. Second Wave of Reforms 12
2.6. Summary Lessons 12
Note 14
References 14

Chapter 3 Drivers of Reform and Responses **15**
3.1. Fiscal Pressures 15
3.2. National Reform Agenda—Competition Policy 17
3.3. Corporatization of Water Utilities 20
3.4. Efficiency Reforms 21
3.5. Economic Regulation in the Millennium Drought 23
3.6. From Urban Water Reform to Integrated Resource Management 24
3.7. Summary Lessons 25
Notes 25
References 26

Chapter 4 Reform Framework **27**
4.1. Establishing a Shared Direction 27
4.2. Role of Champions in Reform 28
4.3. Smart Incentives 28
4.4. Coordinating Institutions 29
4.5. Role of Water Utility Leaders 29

4.6. Economic Regulation 30
4.7. Procurement Practices 31
4.8. Summary Lessons 32
Note 33
References 33

Chapter 5 Differentiating Experience of Reforms 35
5.1. Amalgamation of Regional Water Utilities 35
5.2. Restructuring Approaches in Victoria and Queensland 37
5.3. Pricing Reform and Productivity 37
5.4. Aggregation or Disaggregation 38
5.5. Summary Lessons 42
Notes 42
References 42

Chapter 6 Key Messages from National-Level Reforms 43
References 45

Part II Case Study of New South Wales 47

Chapter 7 Summary and Structure 49
7.1. The Urban Water Reform Story in New South Wales and Australia 49
7.2. Relevance for Other Jurisdictions 50
7.3. Changes in Sector Structure and Institutions 51
7.4. Reform Framework in New South Wales 52
7.4.1. Policy and Operating Framework 52
7.4.2. Commercialization and Corporatization 53
7.4.3. Structure of the Urban Water Sector 55
7.4.4. Increasing Role for the Private Sector 55
7.4.5. Independent Price Regulation 57
7.5. Reform Outcomes 58
7.6. Structure of Part II 59
Notes 59
References 60

Chapter 8 Context 61
8.1. Sector Objectives 61
8.2. Structure of Government in Australia 62
8.3. Geographic Context for the Water Sector in New South Wales 63
8.3.1. Allocation of Responsibilities and Sector Structure 65

8.4. Background 67
8.4.1. Sydney Water Corporation 67
8.5. Hunter Water Corporation 68
8.6. Comparison with Urban Water Structures in Other States 69
8.6.1. Melbourne 69
8.6.2. Queensland 69
8.6.3. Factors behind Different Models 70
8.6.4. Assessment of Models 71
Notes 72
References 73

Chapter 9 Framework for Improving Performance 75
9.1. Framework Adopted 75
9.2. Evolution of the Framework and Its Implementation 75
Notes 79
References 79

Chapter 10 Current Policy and Operating Framework 81
10.1. Overview of the Policy and Operating Framework 81
10.2. Microeconomic Reform and the Water Sector 83
10.2.1. National Competition Policy 83
10.2.2. Water-Specific National Reform Agenda 85
10.2.3. Council of Australian Governments Water Reform Framework 1994 87
10.2.4. National Water Initiative Pricing Principles 2004 88
10.3. Water Resource Planning 90
10.4. Drinking Water Standards 92
10.5. Wastewater Discharge Standards 92
10.6. Subsidy Policy 94
10.7. Access and Postage Stamp Pricing 94
Notes 97
References 98

Chapter 11 Commercialization and Corporatization 99
11.1. Commercial Policy Framework 99
11.2. Financial Framework for State-Owned Corporations 102
11.3. Sustainability of the State-Owned Corporation Model 106
11.4. Status of the State-Owned Corporation Model in New South Wales 108
11.4.1. Strength of Ownership Supervision and Monitoring 108
11.4.2. Strength of Barriers against External Interventions 109

Notes 110
References 111

Chapter 12 Increasing Role for the Private Sector 113
12.1. Development of Private Participation and Competition 113
12.2. Benefits of Competition 115
12.3. Challenges Arising from Competition 116
12.3.1. License Conditions and Noncommercial Obligations 116
12.3.2. Postage Stamp Pricing 116
12.3.3. Access Pricing Regime 117
12.3.4. Privatization of the Sydney Desalination Plant 118
Notes 118
References 119

Chapter 13 Water Scarcity and the Construction of the Sydney Desalination Plant 121
13.1. Water and Scarcity 121
13.1.1. Usage Restrictions and Regulations on Water Efficiency 122
13.1.2. Scarcity Pricing 123
13.1.3. Decision to Build the Sydney Desalination Plant 124
13.1.4. Comparison with Perth and Melbourne 126
13.1.5. Implications for Prices 127
13.1.6. Lessons for the Future 128
Notes 129
References 129

Chapter 14 Approach to Price Regulation and Licensing 131
14.1. Establishment of Independent Price Regulation 131
14.1.1. Why Establish Independent Regulation of Government Businesses? 131
14.2. IPART's Powers and Independence 133
14.3. Objectives and Processes for Reviews 134
14.4. Evolution in IPART's Approach to Regulating Prices 138
14.5. Form of Control 140
14.6. Future Challenges and Evolution 140
14.6.1. Sydney Water Corporation's Priorities to Improve Regulation 140
14.6.2. Future Challenges 143
Notes 144
References 144

Chapter 15 Current Performance and Outcomes 145
15.1. Prices 145
15.1.1. Pricing Reform 146
15.1.2. Current Water Prices 149
15.1.3. Key Outcomes 150
15.2. Profitability and Financing 157
15.2.1. Profitability 157
15.2.2. Increase in Stand-Alone Credit Rating 158
15.3. Increased Efficiency 158
15.3.1. Productivity and Costs 159
Notes 162
References 162

Chapter 16 Concluding Comments 165
16.1. Drivers for Reform 165
16.2. Role of the Commonwealth Government 165
16.3. Role of the State Governments: Leading and Implementing 166
16.4. Role of the Regulator and Regulation 166
16.5. Promoting Efficient Provision of Services and Use of Resources 167
Annex 16A—IPART's Approach to Setting Revenues and Prices 167
Notes 176
References 176

Appendix A Key Water Sector Interviewees in the Research 177

Appendix B Reform Timelines for National, State, and Utility Levels 179

Appendix C Literature Summary 181

Boxes
3.1. How Competition Payments Work 19
7.1. Managing Water Scarcity and the Sydney Desalination Plant (SDP) 56
10.1. How Competition Payments Work 85
10.2. National Competition Council Assessment of Water Sharing Plans 86
10.3. Summary of Community Service Obligations Policy 95
13.1. Sydney Desalination Plant 125
14.1. Pricing Objectives in IPART's Act 135
16A.1. Steps in Setting Water, Wastewater, and Stormwater Prices 170

Figures

ES.1. Two Phases of Urban Water Supply Reforms in Australia, 1994-2014 4
ES.2. Drivers, Determinants, and Factors 4
3.1. Real Operating Cost per Property ($A) of Water and Wastewater Services, 1987-88 to 2003-04 17
4.1. Drivers of Reform 32
5.1. Reform Pathways at Different Levels of Governance 36
7.1. Water Reform in New South Wales in the Context of the National Reforms, 1980s to Present 52
9.1. Water Reform in New South Wales in the Context of the National Reforms 76
11.1. Statutory State-Owned Corporation Governance Model 101
13.1. East Coast Millennium Drought: Cumulative Variation in Rainfall from Long-Term Average (mm) 122
13.2. Prices and Demand - International Comparison 123
13.3. Sydney's Total Dam Storage Levels, 2001 to 2010 125
14.1. Defining Water Sector Economic Regulation 133
14.2. Affordability Instruments 136
14.3. Typical Process for a Price Review 137
15.1. Components of Sydney Water Corporation Revenue, 1993-2011 151
15.2. Index of Average Residential Bills (in Real Terms) 152
15.3. Per Person Demand Trends, 1991-2009 (12-Month Rolling Average), Sydney Water Corporation 153
15.4. Per Person Water Demand Since 1952, Sydney Water Corporation 154
15.5. Value of Payment Assistance Vouchers Provided to Customers 154
15.6. Total Number of Residential Customers on Whom Water Flow Restrictions Have been Imposed 155
15.7. Operating License Performance, 1995-2014 155
15.8. Water and Sewerage Complaints 156
15.9. Number of Properties Experiencing Unplanned Water Outages > 5 Hours 156
15.10. Number of Properties Experiencing Uncontrolled Sewage Overflows in Dry Weather 157
15.11. Return on Assets, Sydney Water Corporation and Hunter Water Corporation, 1994/95 to 2014/15 157
15.12. Productivity and Cost Trends, Sydney Water Corporation, 1996-2009 160
15.13. Underlying Operating Expenditure per Property (in Real Terms) 161
16A.1. Overview of the Determination of Regulated Revenues or Average Prices 168

Maps

1.1. Australian States and Territories 8
3.1. Location of Australia's Major Urban Water Utilities 21

8.1. Population Density of Australia, June 2010 64
8.2. Water Basins of Australia 65
8.3. Comparison of Sydney Water Corporation to Thames Water and New York City Water 67
8.4. Hunter Water Corporation's Area of Operation 68

Tables

2.1. Key Reform Milestones and Outcomes, Australia 13
3.1. Key Drivers and Responses by Government Agencies, Australia 16
3.2. Water Utilities of the Capital and Major Cities, Australia 23
5.1. Institutional Structure of Water Service Provision in Australia, by Region 39
5.2. Independent Economic Regulators: Pricing Functions and Coverage, Australia 40
7.1. Urban Water Sector in New South Wales: Before and After Reforms 51
8.1. Agencies Responsible for Regulating Water Utilities in Major Urban Areas, Sydney, Central Coast, and Hunter Valley 66
8.2. Agencies Responsible for Regulating Water Utilities Outside Major Urban Areas, Murray-Darling Basin and Coastal Basins 66
9.1. Reform of the Urban Water Sector, Australia 78
13.1. Water Usage Restrictions 122
14.1. Key Decision Points in IPART's Successive Water Determinations 139
15.1. Water Prices for Sydney Water Corporation and Hunter Water Corporation, 2016-17 149
15.2. Operating Cost (Water and Sewerage) per Property, 2010-11 to 2014-15 (Australian $/Property) 162
A.1. Interviewees 177
B.1. Reform Timelines for National, State, and Utility Levels, Australia 179

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Abbreviations

ACCC	Australian Competition and Consumer Commission
AWA	Australian Water Association
BOM	Bureau of Meteorology
BOOT	Build-own-operate-transfer
CAPM	Capital asset pricing model
CAPEX	Capital expenses
COAG	Council of Australian Governments
CRCWSC	Cooperative Research Centre for Water Sensitive Cities
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DPI	Department of Primary Industries
EPA	Environment Protection Authority
ERA	Economic Regulation Authority (Western Australia)
ESC	Essential Services Commission (Victoria)
ESCOSA	Essential Services Commission of South Australia (South Australia)
GPT	Government Pricing Tribunal
HIC	High-income country
HWC	Hunter Water Corporation
ICRC	Independent Competition and Regulatory Commission (Australian Capital Territory)
IPART	Independent Pricing and Regulatory Tribunal (New South Wales)
IWC	International Water Centre
KPI	Key performance indicator
LMIC	Low- and middle-income country
NCC	National Competition Council
NCP	National Competition Policy
NWC	National Water Commission
NWI	National Water Initiative
OECD	Organisation for Economic Co-operation and Development
OTTER	Office of the Tasmanian Economic Regulator
QCA	Queensland Competition Authority
ROA	Return on assets
ROI	Return on investment
SCA	Sydney Catchment Authority
SDP	Sydney Desalination Plant
SOC	State-owned corporation

SWC	Sydney Water Corporation
TFP	Total factor productivity
TPA	Trade Practices Act
WICA	Water Industry Competition Act
WSAA	Water Services Association of Australia

Part I Australian Urban Water Reform Story

Chris Salisbury and Brian W. Head

Executive Summary

Urban water services in Australia are recognized as delivering efficiency, productivity and security of supply as well as upholding robust environmental standards. This has not always been the case, and how Australia has reformed urban water supply services has yet to be fully documented. The story of reform in the Australian urban water sector is varied and multifaceted. It is a story of government policy leadership together with sector-driven changes and adaptations, in response to shifting institutional, economic and environmental conditions and demands.

To assist in understanding this story of progress, this report focuses on highlighting the important context for each of the significant Australian reforms, and emphasises why unique and varied historical circumstances (along with the influential figures involved) in this process matter. The report begins by outlining the study background, including the aims of the study, the framework used, and the research methods. The report describes reforms in the Australian urban water supply services in four main parts:

- Historical context and chronology of reforms
- Drivers of reforms and formal responses by governments
- Development of a retrospective framework for reforms by exploring how they were translated into actions
- Exploration of the experiences of states and utilities in the reform process

Through these components of reform, the roles of institutions, structures, and stakeholders are considered, including (a) the national, state, and local governments; (b) in-service delivery models in the urban water sector; (c) regional utilities; (d) economic regulations; (e) financial incentives; (f) the private sector; and (g) a growing focus on customer service and engagement. Part II provides a deep dive into the reforms that took place in New South Wales. This deep dive allows the reader to understand how the broader national reforms played out at the state level.

A summary of the *history of reforms* in the Australian context over a 30-year period from the 1980s through 2010 is provided. The narrative covers the transition from the traditional model of "build and supply" urban water utilities—based on a rigid structure of state-owned bodies, which were highly fragmented across the nation—through isolated attempts at pricing reform, and subsequently, a series of national economic reform agendas that enabled transformation of the urban water sector.

Over the decades the *drivers of reform* varied: the first phase focused on improvement of water supply performance and outcomes, the roles of the states and the federal government, governance reform, and corporatization of the water sector. The second phase was to a greater extent driven by the impacts of drought. Responses included the adoption of integrated water resource management approaches, including consideration of the challenges

and pathways for achieving security of supply. The research herein provides an understanding of the factors that were relevant at different times, and in different places, in the reform process (figure ES.1, figure ES.2).

The research shows that three core sets of activities underpinned the initial state- or utility-led reform programs, and of the later national-level reform agendas of the Council of Australian Governments (COAG) and the National Water Initiative (NWI). These core activities included the following:

- Reforming the pricing of urban water services and supply
- Modernizing institutional arrangements and structures
- Improving environmental and resource management

The report then outlines the *reform framework* as defined by COAG (Figure ES.2), exploring the workings of institutional reforms that not only increased utility efficiency and return on investment but also helped to broaden the skills and "water knowledge" of utility management.

FIGURE ES.1. Two Phases of Urban Water Supply Reforms in Australia, 1994–2014

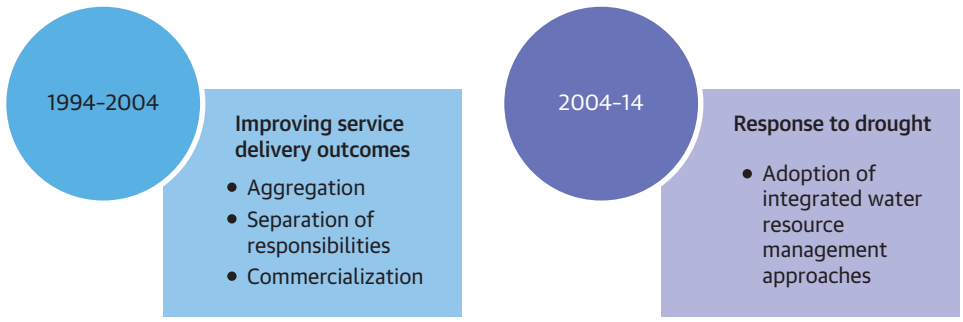
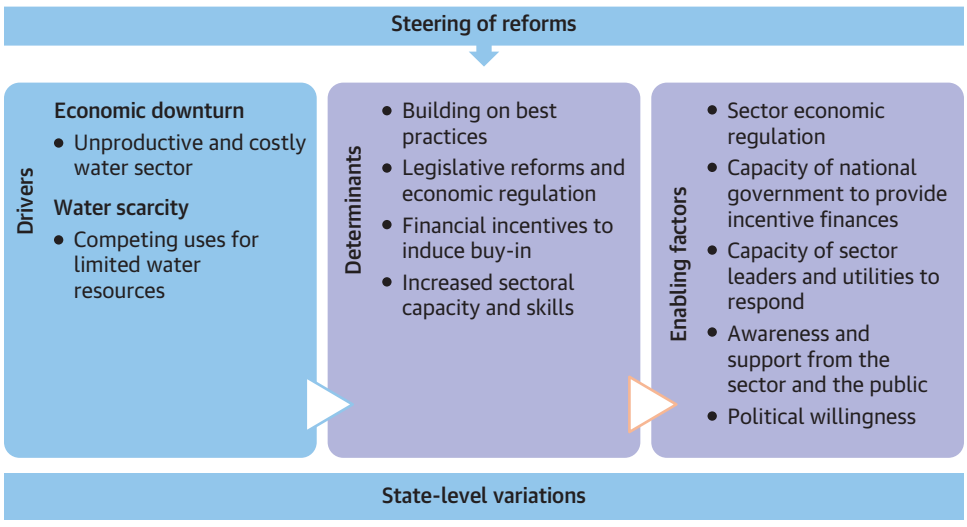


FIGURE ES.2. Drivers, Determinants, and Factors



Differentiation occurred across the states, and the report highlights the *state-level evolution* of the implementation approaches to match the challenges in each jurisdiction. Hence, while reform was guided by a common vision, and directed toward a common goal, reform was achieved while respecting the need for unique approaches among states.

The World Bank and its client countries in Latin America, Africa, Asia, and Eastern Europe can learn lessons from the Australian water reform process. As described in this report as well as in the New South Wales analysis (part II), the Australian water sector reform involved difficult and forward-looking changes at the institutional, policy, and regulatory levels that spanned a number of decades. The process

involved an important and mostly amicable interplay between the federal and state governments, including performance-based fiscal transfers to states that undertook reforms—and therefore required the necessary budget at the federal level to provide sufficient incentives (i.e., $A 5.7 billion over a seven-year period). Independent regulation was put in place, limiting political interference and enhancing financial sustainability in the sector. There were clear champions at the political and top posts in the utilities who were ready to undertake tough and wide-reaching changes, including reacting quickly to immediate needs, such as drought.

The World Bank operates in countries with quite different enabling environments and economic contexts than Australia. The types of challenges low- and middle-income countries (LMICs) often face in the water sector include:

- Insufficient financial resources to make the investments required to increase access and improve service delivery
- Lack of incentives on the part of service providers to improve service quality and efficiency
- Inequity in coverage between rural and urban areas
- Challenges with ability or willingness to pay (at least once connected to a network)
- Inability to sustain service level improvements
- Management of extreme circumstances, such as very constrained water resources or floods

Contextual factors that were important in Australia may or may not exist in Bank client countries. For example, the establishment of an effective forum for developing intergovernmental agreements (i.e., COAG) and the relatively small number of states and territories participating in the negotiation of national strategic agreements can be challenging in many LMIC environments. The ability to establish a regulatory system removed from political interference and, therefore, make fairly predictable and consistent decisions to support financial sustainability can also be challenging. The World Bank's *World Development Report 2017: Governance and the Law* states that commitment, coordination and cooperation ("the three Cs") are critical for appropriate governance to effectively deliver services. Many LMICs have far to go on establishing and implementing institutional, policy, regulatory, and other interventions that enhance the three Cs, whereas Australia's water sector already embodies these principles.

Nevertheless, being cognizant that there are really no "best practices" (*WDR* 2017 encourages development practitioners to move away from this notion) and that each enabling environment is quite different, there are lessons to learn from the reform process in Australia's water sector. In particular, countries organized in the federal-state model can learn from the reform process in Australia, which clearly has involved mechanisms and practices enhancing some degree of commitment, coordination, and cooperation from both

the federal and state levels. Further, Australia's sector is dominated by corporatized state-owned enterprises; therefore, there are good lessons for LMICs that rely heavily on publicly owned utilities, including on how to incentivize, regulate, and monitor them. The common process steps observed from the Australian experience are distilled in this report, and may help inform development practitioners seeking to take a similar reform journey toward greater efficiency and effectiveness in the urban water sector.

Chapter 1 Introduction

In 2016, the International Water Centre (IWC), with funding from the World Bank, commenced a review of the water utilities reform processes in Australia. The aim of this work is to explore the key success factors in the reform of urban water supply services through a study of the Australian example, from which relevant lessons can be drawn for other countries. To meet this aim, the IWC and researchers from the University of Queensland have sought to identify commonalities and differences between the steps taken by the various states and water utilities during Australia's experience of reform in the urban water sector.

In Australia, responsibility for land and water management is delegated to states (six states and two mainland territories; see map 1). States each play a leading role for water policy for urban water supply, with local authorities taking the main delivery role for water services beyond the major cities. The national government assumes roles associated with enablement, funding, and oversight, and setting strategic directions to ensure national interests. The progress of the Australian urban water reform process has been an interplay between those levels that is neither simple nor linear. Our research examines and illustrates the Australian case through a framework that distinguishes between "levels" (scales) and paces of reform. Documentation of Australia's reform history needs to differentiate between the states' actions; this allows for inspection of different approaches and paces in reform, and highlights how shared approaches evolved in different settings to address unique challenges.

One goal of our research is to reveal insights into the interplay between the state level of reform and regulation and national framework agreements. The related story of regulatory oversight, as part of the overall reform process, has been examined elsewhere. For example, the role of the Independent Pricing and Regulatory Tribunal (IPART) in New South Wales is important to that state's pricing, regulatory, and sector reforms. Because there are many lessons to be learned from the New South Wales case—including and beyond IPART—the urban water sector reforms in New South Wales are the subject of a case study (see part II).

Thus, this report analyzes urban water reforms initiated by recent national agreements in Australia, and demonstrates variations between jurisdictions and between approaches at different times. The analysis focuses on water utilities in the major cities (principally the state-level capital cities). The analysis also demonstrates how the Australian urban water reform process is part of a wider and longer series of national and subnational regulatory reforms since the late 1980s. These include competition policy reform, corporatization of government agencies, and the formation in the 1990s of the Council of Australian Governments (COAG). The COAG was crucial for bringing all states on board for reform in Australia, but there are major questions about how such coalition building among governmental leaders and senior bureaucrats can be adapted to the circumstances of other countries.

Some of the factors that led to successful reforms in Australia include (but are not limited to) incentives, political will, skill levels, technology, funding, and increased customer focus.

MAP 1.1. Australian States and Territories

Source: Australian Public Services Commission *(http://www.apsc.gov.au/)*.

The approach also includes analyzing key institutional, financial, and technological changes at the federal, state, and local levels over the last three decades to develop a nuanced understanding of the story of Australian urban water reform. A detailed literature review of existing documentation on the Australian reform process (summarized in appendix C) was completed to bridge gaps in the current knowledge base and to direct the focus of the data collection stage. The review found that while the Australian reform process enabled more effective institutional and financial practices to emerge, further work is needed to document successful changes and innovations.

After completion of the literature review, targeted, semi-structured interviews were conducted with key informants in the water sector (table A.1). The stakeholder interviews set out to highlight the key tools, processes, and systems that were developed locally and were used to drive reform over recent decades. The interviews attempted to distill perspectives from senior government, state, and local levels to identify the challenges and strategies to drive reforms forward. The process gathered insights to test and enhance the understanding from the existing literature, and to deepen and validate the Australian urban water reform story from a range of stakeholder perspectives. This process broadened the scope of lessons learned from the Australian reform experience, which might be applicable in other contexts.

Chapter 2 History of Reforms

The research for this report examined the interplay and collaboration between various levels of government, water utilities, and sector governance bodies in Australia. The results fit into the wider context of government major reform agendas, such as the National Competition Policy (NCP), introduced by the national government in the mid-1990s. But there are several contextual factors to consider along the reform pathway; being aware of these multiple strands in which reform appeared can help draw out relevant lessons for other contexts. Policy makers need to consider how the story of Australian urban water reforms can be interpreted from different perspectives, and with a view to the historical context from which the reform movement emerged and played out. This information is gleaned from historical accounts and supplemented through interviews with urban water sector experts whose insights and perspectives help focus attention on relevant contextual factors.

2.1. Australian Context

Since the beginning of European settlement of the Australian continent, access to water resources has been a central concern of life and livelihoods, much as it had been for the indigenous inhabitants in previous centuries. Yet the British colonies in Australia faced problems with water management from early times, owing to their unfamiliarity with the water supply and the climatic vagaries of Australia's environment. Australia is now renowned for its highly variable climate, evidenced by recurrent droughts interspersed with periodic floods. Unpredictable rainfall patterns and high rates of evaporation mean that Australia is the driest inhabited continent, yet, probably unsurprisingly, among the "thirstiest" of water consumers in today's terms. To illustrate this, Australia—with a population of roughly 24 million, of whom about 90 percent live in dense urban areas on the coastal fringe—stores more water per head of population than any other developed nation (BOM 2015).

Since federation in 1901, Australia is a commonwealth of six states and two mainland territories. Under the nation's Constitution, the governments of these separate jurisdictions bear responsibility for land and water management, with the national government assuming responsibility for enablement, funding and oversight, and seeking to chart directions for "the national interest" (AWA 2012). This relationship between government levels has shaped the processes for water management for more than a century. By the 1980s, governments and their agencies were wrestling with difficult economic and cross-jurisdictional environmental challenges, with many calling for a national approach to tackle the most pressing issues. One such challenge was developing a national water reform agenda, which required the agreement of the national government and the governments of each of the states and territories.

2.2. Build and Supply Era

The period from federation in 1901 until the latter part of the 20th century was characterized as a "build and supply" development phase of large-scale water storage construction and distribution systems in each of the states. During this period a fairly rigid structure of state-owned water bodies were consolidated, operating on traditional "unlimited public resource" assumptions. By the 1980s, however, the large investments in capacity building in the water resource sector had brought numerous problematic issues to light. Governments were saddled with a significant legacy of debt and ongoing system maintenance expenditures after many years of substantial infrastructure investment. The short-term focus behind some water infrastructure development left certain regions experiencing increasing water demand and competition for scarce and variable water resources, with limited options to augment existing storage sites in a cost-effective manner.

During this period Australia's water sector was, and in some regions still remains, highly fragmented. The system was dominated by large, bureaucratic, publicly owned institutions, which provided water and sewerage services to the capital cities, but there were also hundreds of small authorities or local government agencies providing variable quality, sometimes unreliable, and nearly always unprofitable, water and sewerage services to regional communities. This fragmented pattern invited cross-subsidization to other local government services in those communities. These water authorities set their own service charges and in many cases established inconsistent environmental standards. Prices for water services in urban centers had long been tied to property values, rather than the actual costs of water supply or levels of water consumption. Water metering was not used universally across the major cities, and in one instance, the City of Brisbane in the 1980s even abandoned a metering plan for new residential subdivisions owing to concern about electoral popularity. River catchment areas and marine outflows surrounding major cities frequently suffered from poorly controlled urban wastewater discharges. As the public increasingly demanded consistent and affordable piped water services, governments faced an increasing need to enforce environmental standards coupled with increased pressure for financial efficiency. As a result, the focus of water management in urban settings eventually shifted to tackling debt control; ineffective water pricing and service delivery; and environmental impacts and water security. These changes did not occur overnight, but unfolded over a 30-year period commencing in the 1980s.

2.3. Early State-Led Initiatives

Initial reforms emerged at utility and state levels. Typically these early initiatives were isolated responses to specific issues within their respective jurisdictions. In Victoria, a Public Bodies Review Committee, established in 1980 to evaluate all public organizations, undertook a wide-ranging and bipartisan review of water management. At that time there were many small urban water authorities in Victoria outside the capital city, some with a

customer base of less than thirty residents. The committee's detailed study of institutional arrangements and water resource management produced an influential report in 1983, setting an agenda for long-term water reform in Victoria (Public Bodies Review Committee 1983). The report drove structural change in Victorian water reform for decades following. It led to the consolidation of water authorities to less than 20, and responsibility was shifted from local government to state authorities. This was a significant reform milestone, sending signals to other states and to the national government of what could be achieved in the context of bipartisan agenda setting.

2.4. First Wave of National-Led Reforms

Prime Minister Bob Hawke (1983-91) had played a key role as a consensus builder, guiding his government on what was politically feasible and how best to achieve collaborative reform that was palatable to the public. Hawke's example, and his legacy of a shared policy agenda, paved the way for his successors in the government and industry sectors in the 1990s. Hawke helped establish settings in which often difficult structural reforms were achievable owing to consensus politics, which he promoted. In fact, a Hawke proposal to convene regular "special Premiers conferences," the first of which was held in Brisbane in 1990, proved to be the forerunner of the Council of Australian Governments (COAG) in 1992. Moreover, the Hawke government increased the social wage as part of its lauded Wages Accord with the nation's trade unions, a policy that allowed it the public standing to introduce further economic liberalization reforms.

The impetus for national economic reforms in the 1990s largely came from Hawke's successor as prime minister, Paul Keating (1991-96).[1] He was supported in these endeavours by a reformist federal Cabinet, and also by a willing band group of state leaders who supported the economic liberalization and efficiency agenda. Between 1983 and 1996, the Hawke and Keating governments achieved a package of social and economic reforms including improved service provision, higher government transfer payments, and streamlining of the taxation system in an economic or political environment not always conducive to such changes.

2.4.1. Scaling Up Urban Water Pricing

An example of early water reform is the case of urban water pricing. Over the course of a decade, most urban utilities moved toward a "user pays," multitiered tariff pricing regime in place of inefficient charges based on property values. That initiative first emerged in the city of Perth, Western Australia, in the late 1970s, largely in response to rapidly and continually declining inflows to local reservoirs from the middle of that decade. In an effort to pursue demand management, Western Australian water authorities established a two-tiered pricing system for urban water consumption. That policy direction was extended in New South Wales in 1982 when Dr. John Paterson, the assertive director of the Hunter District Water Board, introduced "user pays" pricing in Newcastle and later in the entire Hunter Valley

when it too was confronted with potentially serious water shortages and simultaneous financial pressures (AWA 2012; NWC 2011).

While water pricing reform is a difficult undertaking, pricing reform initiatives extended to Melbourne in the mid-1980s and to Sydney shortly thereafter when it was seen that the change could be acceptable to stakeholders and communities. By 1994, there had already been substantial urban water pricing reform in most states and territories, a process that was well underway before COAG enacted a series of national reform planning agreements in the 1990s. While much progress in pricing reform was achieved prior to national government interventions, the COAG water reform policy framework and the NCP provided an enabling environment to a nationwide action of water pricing. This iterative process is also indicative of the long time frame involved in such reform agendas: the 15 years involved in working price reform through the system was, in effect, a proving ground for the major set of national reforms that followed.

2.5. Second Wave of Reforms

The Hawke and Keating national governments exhibited a strong need to reform the productivity of all core economy-supporting services under government control: not only water but also other utility-related or infrastructure-related services in the energy, communications, and transport sectors (e.g., electricity, gas, ports, roads, and telecommunications). The agenda, which started with the NCP in the mid-1990s, was focused on productivity and economic returns. In the late 1990s, one of the most severe droughts hit modern Australia—the Millennium Drought (late 1996 to mid-2010). This triggered a second wave of reforms focused on supporting broad environmental goals along with achieving water security for urban areas.

2.6. Summary Lessons

The urban water sector in Australia leading up to the 1980s was characterized by state-owned or local government-managed utilities and entities that were unprofitable, often unreliable and underresourced, and acting in isolation. Structural reforms to the urban water sector were initiated by state-level governments keen to tackle indebtedness, ineffective water pricing and service delivery, and environmental impacts. These reforms were then broadened and intensified through national economic reforms, introduced by the federal government with state consent in the 1990s (see table 2.1). New challenges associated with drought and increased demand for better management of water as a finite resource triggered a second wave of reforms.

TABLE 2.1. Key Reform Milestones and Outcomes, Australia

	Reform milestones	Keys reform outcomes
State- and utility-led early reforms	1978: Two-part tariff (with water allowance)—Perth Water Board (Western Australia) 1982: "User pays" pricing (water allowance removed)—Hunter District Water Board (New South Wales) 1983: Public Bodies Review Committee propose amalgamation of smaller utilities in Victoria 1986: "User pays" pricing—Melbourne and Metropolitan Board of Works (Victoria) 1987: "User pays" pricing—Sydney Water Board (New South Wales) 1992: IPART established (New South Wales); HWC corporatized (New South Wales); Melbourne Water corporatized (Victoria)	• Track record of potential for focused Public Bodies Review Committee to frame approaches to water reforms • Consolidation of water authorities • Pathways and benefits for price reforms • Awareness of potential for bipartisan support for reforms
First wave of national-led reforms	1992: COAG formed; Murray Darling Basin Agreement 1993: Hilmer Committee NCP report; Working Group on Water Resource Policy report 1994: COAG Water Reform Policy Framework 1995: COAG adopted NCP package	• National Competition Policy • Benchmarking systems • Federal incentives for reforms • Corporatization of the utilities • Establishing professional regulators • Water knowledge and expertise
Second wave of national-led reforms	2004 NWI 2005 NWC established 2006 Australian Water Recycling Guidelines 2007 Water Act	Under the NWI, governments made commitments to • Prepare water plans with provision for the environment • Deal with overallocated or stressed water systems • Introduce registers of water rights and standards for water accounting • Expand the trade in water • Improve pricing for water storage and delivery • Meet and manage urban water demands

Note: COAG = Council of Australian Governments; HWC = Hunter Water Corporation; IPART = Independent Pricing and Regulatory Tribunal; NCP = National Competitive Policy; NWC = National Water Commission; NWI = National Water Initiative.

Note

1. Keating was treasurer in Hawke's government in the preceding decade.

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Chapter 3 Drivers of Reform and Responses

> Australia has a strong recent history of successful water reform, through policy development, implementation and institutional governance. The 1994 Council of Australian Governments Water Reform Framework, and the subsequent 2004 National Water Initiative, have driven valuable reforms from a national perspective for the past two decades. The NWI has delivered on a shared commitment to improve Australia's water management through better security of supply, efficiency, and productivity as well as substantial environmental benefits. It has been recognised around the world as a leading-edge reform program. (*AATSE 2014, 1*)

In Australia, reform of the water supply and sanitation sectors gathered momentum from the 1980s with two major waves in the mid-1990s and early 2000s (see table 3.1, further details in table B.1). These two waves are described in chapter 2, while this chapter considers the drivers of reform along with resulting responses at utility, state, and national levels.

With increasing demand for water from competing commercial and domestic interests, governments across Australia by the early 1990s were aware that, in general, the urban water service and supply industry was providing suboptimal contributions to the national economy—and to state economies. Moreover, inadequate natural resource management practices were causing lasting damage to ecosystems, encouraged by a pervasive view that water was an unlimited public resource. Policy makers and others eventually realized that inefficient resource use and unsustainable environmental degradation would soon result in economic and social costs that future administrators would struggle to reconcile. It was widely agreed that change was required on a national scale, and that national and state leaders needed to publicly acknowledge the need for more efficient and effective management of the increasingly scarce and contested stocks of the country's "most precious natural resource."

3.1. Fiscal Pressures

Initially, though, it was economic pressure resulting from the fiscal realities of recognizably inefficient and, arguably, unsustainable models of service delivery and utility operation in most jurisdictions that largely drove the early moves toward sectorwide reforms. As summarized in a National Water Commission analysis of pricing reform (NWC 2011, 10):[1]

> Before the first national water reform package in 1994, governments were using water pricing as an instrument to achieve their prevailing equity, social development and economic efficiency objectives. While some jurisdictions had undertaken reforms, political expediency often prevailed over commercial good sense in delivering water services. This approach to pricing led to problems in rural and urban areas. The 1992

TABLE 3.1. Key Drivers and Responses by Government Agencies, Australia

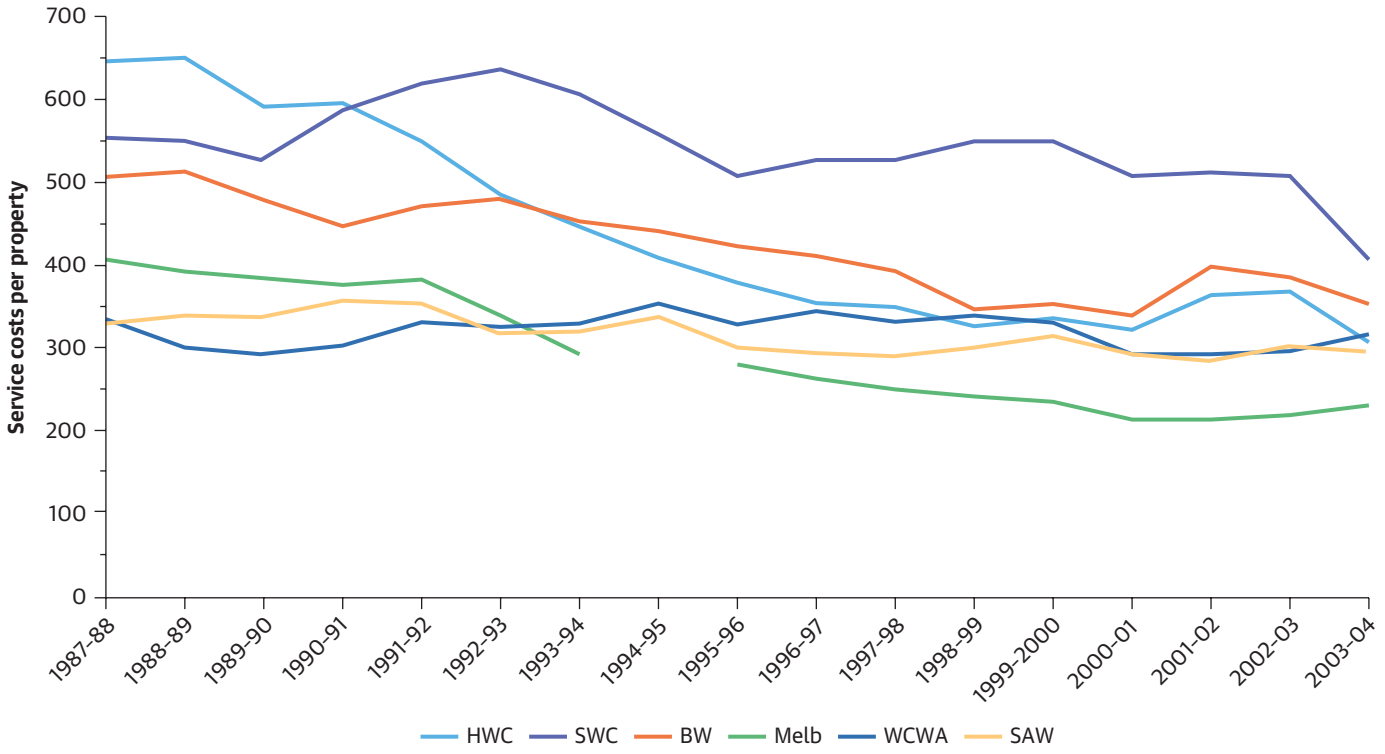
Drivers	Formal responses
Economic downturn • Unproductive and costly water sector (poor cost recovery) • Growing debts associated with water infrastructure and operations Water scarcity • Climate uncertainty and drought resulting in increased water scarcity • Competing uses for limited water resources • Increased environmental awareness with inadequate natural resource management	Legislative reforms and economic regulation to support the following: • Building of collaborative commitments • Gaining political buy-in • Introducing competition policy for public sector • Designing incentives to drive compliance • Financial incentives for improvements • Statewide sharing of water resources • Responsive regional planning • Modeling to reinforce messages about the need for reform (improved water resource planning and allocations)

reports by the [then Industry Commission and a report for COAG on water resources policy, chaired by Sir Eric Neal] identified the following issues:

- Use of water without regard to its cost of supply, leading to excessive consumption and the need for costly investments in new supply capacity … [giving] little financial incentive for customers to limit their consumption;
- service delivery inefficiencies and lack of incentive to provide reasonable levels of service at lowest possible cost … [given] there was no independent regulation of prices or service standards in most rural or urban sectors;
- commercial and industrial water users often paying far more than the costs of service provision (and cross-subsidising domestic water customers), e.g. in Melbourne in 1990-91, households were paying the equivalent of $A 0.66 per KL of water while suburban shops were paying $A 4.27 per KL and office towers in the CBD were paying $A 10.16 per KL. Disparities were even more pronounced in Perth and several other cities. Similarly, the cost of Customer Service Obligations (e.g. pensioner rebates) was high - approximately $A 30 million per year in Sydney - and these were often not fully funded by government, and thus being subsidized by the rest of the customer base.

These commonly experienced issues and cost pressures provided impetus for a national approach to water pricing reforms, which ultimately formed part of the 1994 COAG Water Reform Policy Framework. An indication of the high operating costs to governments and water utilities of water service provision prior to reforms, and of the marked improvement in efficiency in the first decades afterward, is displayed in figure 3.1. It shows a clear decline in real operating costs per property for urban water services from the late 1980s to early 2000s, by which time the next phase of reforms would be designed in response (in many cases) to different pressures and drivers.

FIGURE 3.1. Real Operating Cost per Property ($A) of Water and Wastewater Services, 1987–88 to 2003–04



Source: NWC 2011, 65.

Note: BW = Brisbane Water; HWC = Hunter Water Corporation; Melb = Melbourne Water; SAW = South Australian Water; SWC = Sydney Water Corporation; WCWA = Water Corporation of Western Australia.

Urban water sector reforms certainly did not start (or end) with the 1990s COAG agenda: the states, government agencies, and public utilities had been implementing changes for some years already (though mostly in isolation, in major centers, and capitals in Victoria, New South Wales, and Western Australia). The achievements of state governments in their respective jurisdictions sent clear signals that reform was possible and desirable in both the short and long term. It became clear that a more concerted and consistent approach to engender broad change would be required. Such a shift at the national scale required a departure from the ad hoc, public-funded, "build and supply" approach of so many decades previously. Rather, a coordinated and nationally agreed reform agenda was required to transition water management and water use to a more environmentally and economically sustainable footing, while still yielding social returns to local communities. Table 3.1 highlights key drivers and responses by government agencies.

3.2. National Reform Agenda—Competition Policy

Water supply in Australia is constitutionally the responsibility of the states, not the commonwealth (national government). Apart from one or two exceptions, such as the federal

Water Act in 2007 establishing the Murray-Darling Basin Commission, basically the commonwealth does not have formal authority to legislate on behalf of the states; however, it can indirectly oblige the states to act in certain ways regarding water management through agreements and financial incentives. The National Competition Policy (NCP) and its associated incentive payments (or NCP payments)[2] established by the commonwealth in the mid-1990s became critical in the process of developing and promulgating a national water reform agenda. The Keating government's review of competition policy, begun in 1992 under the direction of Prof. Fred Hilmer, became the policy driver behind the move toward a national water reform agenda. The 1994 water reform framework, building on a report produced the year before by Sir Eric Neal's Working Group on Water Resource Policy, took the form of a Council of Australian Governments (COAG) agreement. In effect, the commonwealth and the states agreed on strategic directions and that the commonwealth would provide incentives for the states' adoption of water reforms.

In a deep-dive analysis of the path of urban water reforms in New South Wales, Eric Groom outlines the specifics of the National Competition Policy package by stating that

> The key elements of the NCP were
>
> - Commercialization and, where appropriate, regulation of government-owned utilities and other government-owned businesses;
> - Creation of a 'level playing field' for government-owned and privately-owned business - for example, equal treatment for tax and competition policy;
> - Establishment of independent price regulations and price reform;
> - Promotion of competition where possible, facilitated by access to essential monopoly facilities (such as 'pipes and wires') where necessary; and
> - Competition payments to the State Governments conditional on compliance with the requirements of the NCP.
>
> The NCP provided for the creation of the Australian Competition and Consumer Commission (ACCC) and the National Competition Council (NCC). Regulatory responsibilities were split between the ACCC, the national regulator, and State and Territory regulators, such as the already established IPART and ESC (Victoria). The ACCC was the regulator under national access regimes which governed regulated access to essential infrastructure and regulation of the national facilities, such as telecoms and airports that were within the Commonwealth's jurisdiction. Water and electricity (and other services traditionally within the governance of the States) were regulated by State-based regulators, but: regulation of terms and conditions for access to essential infrastructure (e.g. pipes and wires) for competitive supply of electricity had to be consistent with the national access regime; regulation of final prices was to be consistent with the principles set out in the NCP. (See Box 3.1 for details on how competition payments worked.)

BOX 3.1. How Competition Payments Work

The Australian Government provided competition payments to the states and territories to reward them for satisfactory progress in implementing their reform commitments. The payments were a recognition by COAG that all governments should share in the benefits of economic growth and the associated higher taxation revenue resulting from the reform program and that, with the high degree of vertical fiscal imbalance, much of the increase in tax revenue would initially accrue to the commonwealth. The Australian Government allocated funds totalling about $A 5.7 billion for competition payments over the period 1997–98 to 2005–06.

The NCC assessed each state's progress of reform and made recommendations to the Australian treasurer on any penalties that would need to be applied. In assessing the nature and size of any penalties that it recommends, the NCC took into account the significance of the compliance breach, the extent of the state or territory government's overall commitment to NCP implementation and the effect of that jurisdiction's reform efforts on other jurisdictions. Penalties fell into three categories:

- Permanent deductions, for specific compliance failures
- Specific suspensions, which applied until predetermined conditions were met
- Pool suspensions (which could be recouped), which applied to groups of compliance failures in nonpriority areas of the legislation review program, but did not warrant an individual penalty

Overall, the sector reforms and operating and regulatory structures would have been less consistent across the states and territories. This is particularly important for sectors that span states, such as the electricity market and Murray-Darling Basin. A component of NSW competition payments in 2003-04 and 2004-05 were withheld in response to the NCC's assessment that there were shortcomings in the water resource sharing plans. In 2005, the NCC assessed that NSW had met the resource planning requirements under the National Water Initiative (NWI) and withheld payments were released. Although causality cannot be shown, this demonstrates the competition payments and compliance assessment scheme apparently working as intended.

Thus, the fundamental change at the national level that drove good governance in Australia's water sector was the 1994 COAG reform agenda. These reforms were linked to competition policy efficiency principles, and each of the states was required to separate its operational delivery bodies from its policy and regulatory bodies (a process begun in piecemeal fashion in the Hunter Valley, New South Wales, in the 1980s). This impetus for change came at the same time that public entities began to become corporatized (or in some cases privatized) and were being restructured along the lines of commercial entities with

appropriate governance arrangements including independent boards, robust strategic planning, and reporting arrangements. As with other elements of the 1990s COAG agenda, there were precursors to this national move toward requiring agency corporatization. The conservative Greiner state government in New South Wales in the late 1980s had successfully moved several government agencies to a commercial footing ahead of other jurisdictions, and its initiatives appear to have informed the nationwide push to do the same in the following decade.

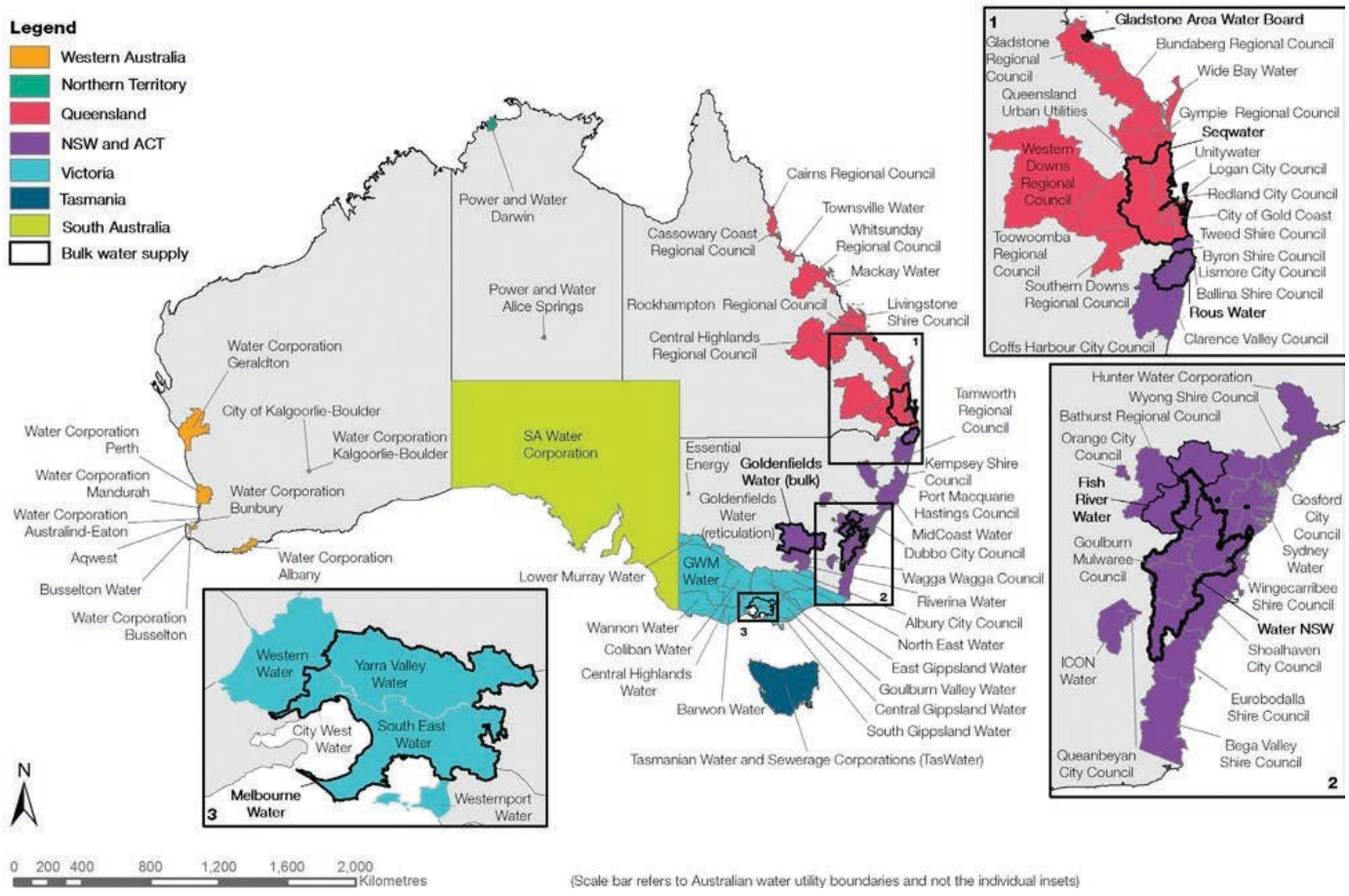
3.3. Corporatization of Water Utilities

Around the time of the 1990s COAG reforms, the costs to the urban water industry of asset enewal were escalating, so the governments collectively set up a system to benchmark those economic costs. They also began considering corporatization of the utilities and establishing independent regulators to oversight quasi-monopolies. COAG was instrumental, for instance, in accelerating the broadening of the role of the Independent Pricing and Regulatory Tribunal (IPART) in New South Wales and the corporatization of Sydney Water. These national reforms flowed to many other large utilities such as those in Melbourne, Perth, and Brisbane; it occurred to a lesser extent in Adelaide, and in Victoria there was a strong interest in privatization of government businesses (other than water). There was a "wave" of corporatization, setting up these organizations as if they were privately owned, while remaining in government ownership; in other words, making them more commercial and more customer service-focused than they had been in the past, which was congruent with the decline in their primary role as infrastructure developers up until the end of the 1980s.

Once these organizations were corporatized, they started paying regular dividends to state governments, and the considerable amounts of money flowing into state coffers prompted a much closer interest in the urban water authorities. When a drought phase emerged periodically, this would further prompt state governments to take more interest in their urban water authorities. Part of this drive toward reform came from the states, but also from the individual water utilities, in which many of the senior leaders were seen to be reform-minded (possibly as a result of an increasing number of "managerial-style" utility leaders, as opposed to the earlier norm of engineer-technocrats). A number of the reform initiatives came from the utilities themselves: urban pricing reform had begun with the Hunter District Water Board and Perth's Metropolitan Water Board, because their CEOs could see more efficient ways of managing their businesses. In the case of the Hunter Board, its CEO (from a nonengineering background) successfully challenged the supply-oriented norm of that organization and effectively spread the word as to the effectiveness of microeconomic reform.

Hence, from the mid-1990s onward there were newly corporatized utilities and emerging regulatory offices in most states, although to varying degrees (see map 3.1). The COAG reforms attempted to promote and strengthen the notion of independent professional regulators, not only of water but also of other services (e.g., electricity and gas) and other utilities that were still largely in public hands. Increasingly there was performance benchmarking of

MAP 3.1. **Location of Australia's Major Urban Water Utilities**



Source: BOM 2016, 18.

these state-owned utilities, many of which were led by activist and competitive CEOs. The competition driven by comparative benchmarking helped drive the pace of change. While benchmarking information was not a basis for external rewarding or penalizing of utilities (or their managers), the annual publication of comparative performance data was an important indicator—and motivator—of levels of efficient service delivery and successful management.[3] The National Water Commission (NWC), established in the wake of the 2004 National Water Initiative (NWI), oversaw the benchmarking. Since then, benchmarking has continued to deliver service improvements despite the abolition of the NWC by the Abbott government in 2014.

3.4. Efficiency Reforms

In the 1990s, the drivers of reform were primarily utility efficiency issues as opposed to water resource management issues, though there were overlaps. The changes tried to bring commercial structures and regulatory oversight into an industry in which much of the

internal operational decision making were responses to political considerations, administrative fashions, and personalities of leaders. The new efficiency focus was linked to a broader agenda known as "microeconomic reform," based on the need to establish rational regulatory and organizational incentive structures. The water sector seized upon the opportunity provided by corporatization (as a legal, institutional, and regulatory framework) to pursue improved performance.

The so-called "corporatization agenda" was a convenient vehicle to overcome a backlog of fragmented regulatory layers and lack of organizational coordination that had evolved out of the previous several decades of water sector operations. While corporatization had its limitations in terms of improved sectoral and resource management, it gave shape to a reform process that required an overarching framework. The previous water supply system, with its perceived failings and shortcomings, was primarily designed to avoid supply constraints, but this emphasis had proved to be a weakness. The imperative to merely supply one essential commodity, in an unaccountable, "unlimited resource" fashion, meant that normal commercial or regulatory frameworks had not been applied.

The main difficulty facing the water sector during the initial reform agenda was not one of resource constraints, supply constraints, or other supply-side concerns. Rather, it was more an obvious lack of efficiency (often in utilities' corporate overheads more than in their core functions) and ambiguities about the utilities' regulatory context. Decision makers recognized that the water utilities needed to provide a "productivity dividend." This applied in two ways: (a) in straight supply-side efficiencies (applying commercial frameworks), and (b) in a more efficient regulatory framework. Corporatized charters and frameworks would provide water agencies and authorities with the foundation to better understand what they were producing (e.g., levels and types of output) and apply commercial management structures in which straightforward managerial reforms could lead to clear productivity benefits.

Some managers were careful not to pursue changes at the expense of standards of supply or service, at least where those standards were already defined. Principles of service obligations needed to be put in place (though not always accomplished quickly in practice), so that applying a commercialization agenda was not simply achieved at the expense of the consumer or the environment. The key was establishing a regulatory structure, though not necessarily through a separate regulatory authority, in respect of service standards. Efficient management could provide greater operational clarity. Utilities developed a rationale or framework around which to pursue commercial efficiency reforms, and this perspective was largely adopted and embraced by the urban water sector. Some leaders involved in implementing changes had worked outside the water industry, witnessing those broader reform issues in the larger economy. It meant taking many principles that underlay the 1980s microeconomic reform initiatives, in areas like reforming industry protection and tariff structures, into the water sector. In that sense the reform agenda of the 1990s, while perhaps unfamiliar for some managers, was probably not so novel for many others.

The final piece of that initial reform phase of the 1990s was to put utilities on more of a commercial footing through a number of measures that changed their governance model (see table 3.2), as well as reforming the way they priced their services according to demand. This latter element involved putting in place independent economic regulations that had not formerly been an operational feature of public bodies (see chapter 5, table 5.2). Establishing a regime for economic regulation proved a critical part of this "building block" approach, attempting to ensure that commercial returns were achieved in those sorts of entities.

3.5. Economic Regulation in the Millennium Drought

In the late 1990s, new drivers for reform emerged and were largely focused on "dollars and drought." Managing change is mostly about leadership and timing, and, in general, the reform initiatives were quite successful when leaders exploited opportunities at the right time. Prime Minsters Hawke and Keating made their case for economic change in the late 1980s and early 1990s, when recession conditions meant that Australia was in danger of falling into a productivity crisis and a related economic recession. They used that opportunity to drive productivity reforms, which became linked to reforms of government business enterprises. Similarly, a group of state leaders and other key figures pushed hard for strategy changes in urban water when the Millennium Drought hit its peak in the early 2000s.

TABLE 3.2. Water Utilities of the Capital and Major Cities, Australia

Major urban center	Utility name	Ownership and Management
Perth	Water Corporation	Western Australia government (board reports to Water minister)
Adelaide	SA Water	South Australia government (board reports to Water minister)
Canberra	Icon Water	Australian Capital Territory government (board reports to chief minister)
South East Queensland (Sunshine Coast, Brisbane, Ipswich, Redlands, Logan, Gold Coast)	Seqwater (bulk), Unitywater, Queensland Urban Utilities, Redland, Logan, and Gold Coast City Councils	Queensland government (Seqwater board reports to treasurer and Water Supply minister); 11 South East Queensland local councils (boards report to their shareholder councils and Water minister)
Sydney (and Wollongong)	WaterNSW (bulk), Sydney Water	New South Wales government (board reports to Water minister)
Newcastle	HWC	New South Wales government (board reports to Water minister)
Melbourne	Melbourne Water (bulk), City West Water, South East Water, Yarra Valley Water	Victoria government (boards report to Water minister)
Hobart	TasWater	29 Tasmanian local councils (board reports to Owners' Representatives Group)
Darwin	Power and Water Corporation	Northern Territory government (board reports to treasurer and Essential Services minister)

Source: BOM 2016, 26.
Note: Major cities are considered ones with populations of 250,000 or higher. HWC = Hunter Water Corporation.

The economic troubles of the late 1980s and the 1992 recession were a major stimulant for the COAG reforms of that decade. But even earlier, in 1982, a severe drought across south-eastern Australia prompted demand management responses. Some of the "user pays" water pricing, such as initiated in the Hunter Valley region or in Western Australia, emerged in part as a result of those significant experiences of drought. And the long-term impacts of successful demand management programs were notable and were recognized in later crises. While urban water consumption in the southern capitals had grown by around 2 percent each year for nearly a century, from 1982 water consumption plateaued (owing in part to the water utilities' responses) and has remained fairly steady in most major centers, despite rapid population growth through later decades (AWA 2012; NWC 2011). This is indicative of the power and longevity of effective reform ideas, which emerged in response to pressures and challenging conditions.

In the second wave water reform period, as the nation approached a crisis point in the midst of the Millennium Drought, urban water leaders faced an urgent need for reform. There was also, however, an uncertainty about which level of government, or which sections within government agencies, should be responsible for drought response and, indeed, long-term water supply planning. Drought conditions provided the impetus for confirming the primary role of state government interventions through a variety of measures, including the following:

- Developing new infrastructure enhancement projects
- Exploring alternative water sources
- Introducing demand management programs (from the mid-2000s)

Interventions were evident in most states but especially in Queensland, which had reacted somewhat more slowly than other states to the earlier reform momentum. Drought conditions, however, drove the government to implement the nation's strictest regime of water use restrictions—and a rapid expansion of "water security" infrastructure—in the heavily populated southeast of that state (Head 2010).

3.6. From Urban Water Reform to Integrated Resource Management

In terms of policy and political responses, those recent developments mentioned in the previous section are reminiscent of actions taken and priorities established at the beginning of the water reform period of the earlier 1980s and 1990s. In the mid-1990s, the NCP formulated the agenda, which was focused on productivity and economic returns, though in respect to water there was a subsequent set of reforms a decade later, in 2004, tailored to integrated water resource planning.

In simple terms, the first period of water reform, 1994 to 2004, was largely about the urban water utilities sector. Owing largely to the extended drought from around 2001, the following period focused especially on integrated water resources management at the level of large

catchments and water basins. Given that the reform of large utilities was largely locked in by 2001, the main focus of the intergovernmental NWI in 2004 was the establishment of the NWC, which had an important monitoring and evaluation function across the urban and rural water sectors.

A specific set of collaborative reforms emerged in 2004 under the guise of the NWI, which followed the trajectory established by the earlier COAG agreements on reform of government business enterprises and the NCP reform program. So while the first reform wave in the 1990s was clearly about productivity and efficiency, the subsequent water reforms from 2004 related to integrated water resource management. Some have argued that the NWI was not a comprehensive water reform agenda (especially in regard to the lesser attention to the urban water sector), but rather a set of guidelines, principles, and objectives about the more efficient management and overall sustainability of scarce water resources in rural Australia, primarily across the Murray-Darling Basin. Urban water reform was seen as a short addition incorporated within the NWI, with a focus on efficient pricing, demand management, and related matters. As the Millennium Drought continued to intensify after 2004, with major effects in major cities, the need for urban water reform gained increasing priority.

3.7. Summary Lessons

Australian water utilities have gradually been transformed into demand-responsive commercial entities. The drivers for change spanned economic, social, and environmental factors, and changed over time. While formal government responses took time, the phased approach retained a focus on achievable steps. The factors that influenced change, and the rate of change, can be discerned at different institutional and organizational levels.

Under the first wave of reforms, restructuring at the utility level followed a three-staged approach including (a) aggregation (or disaggregation in some cases), (b) separation of responsibilities, and (c) commercialization. State-level economic regulation proved to be a "building block" in helping to decouple roles associated with price setting and sustaining efficiency improvements. Economic regulation also helped to ensure a rational regulatory approach and lock in organizational incentive structures (both critical to sustainable improvements).

Notes

1. Prime Minister Keating was also Treasurer in the preceding decade; See also chapter 11 in Part II of this report for discussion of pre-1990s fiscal realities in the urban water sector and various efficiency reforms that followed.

2. "Under the [NCP] Implementation Agreement, the Commonwealth Government undertook to make on-going National Competition Policy payments (NCP payments) to each State and Territory over the period 1997-98 to 2005-06, subject to that State or Territory making satisfactory progress against their NCP and related reform obligations. NCP payments are to be made in three tranches: prior to July 1997, July 1999 and July 2001, the NCC assesses whether each State or Territory has met the conditions for the payments to commence. There are two components to the NCP payments: a guarantee to maintain the real per capita value of the Financial Assistance Grants (FAG) pool available to each State and Territory, and an indexed competition payment" (NCC 1998, 5).

3. Under the NWI, states and territories agreed to the performance benchmarking of pricing and service quality, including undertaking annual public reporting of performance for all urban, regional and rural water delivery agencies. This benchmarking occurred in the context of the development of a nationally consistent reporting framework. The production of National Performance Reports (NPRs), using a nationally consistent framework with benchmarking information supplied by each jurisdiction, largely delivered on this outcome. The [National Water] Commission coordinated jurisdictional reporting. The urban water utilities NPR [was] produced annually from 2005-06 and represents all utilities with more than 10,000 connections, providing water to about 18.7 million Australians. Jurisdictions and the urban water industry body, the Water Services Association of Australia, identified that the urban NPR is considered to be an example of national and international best practice in performance reporting with benefits exceeding costs (NWC 2014a, 47).

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Chapter 4 Reform Framework

Reform in Australia's urban water sector has been varied and has occurred at different paces in various locations. Previous chapters have explored the timeline of reforms, the drivers, and reform responses. Factors that influenced change and reform have included (a) financial and legal incentives, (b) technology, (c) business models, and (d) new orientations toward achieving good water management and greater water security. This chapter considers how those reform measures and approaches translated into actions. Consideration is given for the importance of shared direction, the roles of different stakeholders, and institutions for enabling effective coordination. The type of incentives and importance of economic regulation are emphasized.

4.1. Establishing a Shared Direction

The Australian example of urban water reform highlights how a set of reform principles was used to engage states and territories around a shared focus, but with sufficient flexibility to allow different emphases and a variety of institutional arrangements to emerge and persist in different jurisdictions (see table B.1). The process for institutional reforms and the types of models adopted in different states in Australia highlights the diversity of pathways that can be considered within and among different regions when the nationally agreed model is based on principles and standards rather than prescriptive solutions. The scope for differences included the process for (a) decision making around regional versus city-scale planning models, (b) allowance for vertical integration of service delivery models, and (c) creation of regulatory institutions to oversee price setting and performance levels.

A central goal of the Australian reforms was to transform underperforming utilities into demand-responsive commercial entities, increasing the efficiency of service delivery. A second factor in building support toward a shared goal was recognition that reforms could be achieved only through negotiated outcomes with stakeholders and communities that were politically feasible at the time. This had implications for how reforms progressed and the pace of reform over time, emphasizing that water reform has been an iterative process: when settlement is finally reached on an issue, it becomes another step in the reform process, with further steps to come.

Understanding the sequencing of structural and institutional reforms, coupled with targeted government incentives, is important for understanding how central- and state-level decision makers leveraged service delivery improvements. Examples from the Australian case underlined the benefits of improved statewide sharing of water resources for more responsive regional planning, and how improved modeling could be used to reinforce messages about the need for reform. Financial incentives were an important means to bring states to the negotiating table, but there were other factors that engaged and motivated states through the reform process, such as the leadership role of reform "champions." The twin motivations provided by water scarcity and the need to consider water resource

planning from a more integrated and systemic perspective also played key roles in how reforms unfolded.

4.2. Role of Champions in Reform

The success of the mid-1990s COAG reforms in respect of water policy can be linked to the strategic work of the COAG Working Group on Water Resource Policy. A leading businessman, Sir Eric Neal, was appointed as chair of this working group, and he drew together reform-minded leaders in the water sector to produce the COAG Water Reform Policy Framework (1994). This group melded the best and most relevant and successful of reforms since 1994 from different parts of the country and created a coherent reform strategy. The working group, by bringing together influential sectoral leaders, adapted best practices from across the country and deepened them by gaining insiders' perspectives on any observed barriers to reform. Under Neal's leadership the group took the smart approach of drawing heavily on existing experience in the water sector, talking often to stakeholders, selecting the best reform initiatives from the leading utilities, and molding these into the broader COAG reform agenda.

4.3. Smart Incentives

The COAG working group recommended financial incentives payable by the federal government (NCP payments) to induce the states to buy in to the agenda and meet commercialization targets. This cleverly tied in with the broader reform and productivity agendas being promoted by COAG at that time. But the incentives program also reflected the fiscal reality of the national government having the lion's share of finances while the states and territories, particularly regarding urban water reform, had the delivery and regulatory responsibilities. Using the inducement of financial incentives had a large impact on the state treasuries: as one interviewee noted, financial "inducement" was the best approach to ensure that the states committed to deadlines and worked toward tightened competition policy settings.

Over the course of nearly a decade (ending in 2005-06), the commonwealth dispersed annually between about $A 400 million and $A 835 million in NCP payments to the states and territories.[1] Little wonder, perhaps, that National Competition Council assessments of competition policy compliance found that the various jurisdictions had largely met their commitments to implement policy measures:

> The NCC commented that competition payments (and by extension penalties for non-compliance) have been an important contributor to the success of the NCP: "Using competition payments to leverage reform outcomes in areas of State and Territory responsibility has proven highly effective. ... Reform would have been far slower and less comprehensive without competition payments. These payments (now at around $800 million per year) may not be large relative to State and Territory budgets, but nonetheless represent a significant source of incremental funds. (*PC 2005, 30*)

A key learning from this longer reform agenda is that those leading and implementing reforms must provide adequate time to break down the agenda into feasible steps and then take people along with them. Reforms cannot be introduced overnight, since several years may be required from the inception of a strategic reform idea to working through the operational details and moving to implementation. This is followed by monitoring and evaluating the effectiveness of the plans have been and determining what the next set of steps might be. This sequence is underlined by the fact that Australia has had roughly 10-year change cycles in the water sector, and other sectors such as energy, in the recent past.

4.4. Coordinating Institutions

The NWC played a very important role in the 10 years it was in place, ranging from agenda setting (in a strategic direction sense), to capacity building (through technical commentary), to independent monitoring of reform progress. While other agencies, arguably, can now take over the role of auditing and encouraging progress of these same issues, the NWC provided an important forum and vehicle through which to focus on and coordinate water reform. Much of the political and bureaucratic focus of the decade after 2004 was on "fixing" the water planning framework for the vast Murray-Darling Basin in South East Australia, which had been marked by cross-jurisdictional conflict and avoidance of decisions on achieving sustainable water allocations. The federal Water Act 2007 established the Murray-Darling Basin Authority, which required a transfer of legislative powers and water management rights from the states to the commonwealth to achieve the legal authority for integrated planning (Skinner and Langford 2013).

The role of professional bodies has also been important in Australia. In the last two decades the Water Services Association of Australia (WSAA)—essentially the water supply industry association—has played an important role within the urban water sector for information exchange and lobbying on areas of common ground, and providing a welcome forum for discussing regulatory and pricing reform. While not principally a shaper of the reform agenda, the WSAA has benefited its member bodies through interagency comparative measurement and in more fine-grained benchmarking processes. The capacity of the urban water sector had been pushed in this direction by the oversight and audit functions of the NWC. Following the demise of the commission, its absence from the national level of reform planning was lamented by senior industry figures and sectoral stakeholders who had witnessed the advantages of having a distinct and dedicated monitoring and benchmarking body for the water sector—The commission had possessed the scale and standing to dedicate considerable resources to strategy and policy thinking, which are otherwise difficult to find.

4.5. Role of Water Utility Leaders

Another key aspect to reform success is that it requires more than restructuring of institutions: it also requires skilled people within or working across them. Most business models have the potential to work effectively, or at least to be reformed into more effective

operations, if the right people are in the key roles. Businesses or agencies might have a strong balance sheet or sound governance structures, but they also need knowledgeable people in key positions. This applies both to key staff members' technical knowledge and—perhaps more important—their understanding of relationships and how to work with stakeholders in government, in other sectors, and in their communities. In other words, successfully reforming institutions is enhanced by having key position holders who understand how to interact with the political and the public levels, as well as the paying customers, and know how to treat them as stakeholders.

To have a successful reform agenda, it is important to have key figures, often from inside government, with the vision and the skills to communicate the need for change, although often not enough thought is given to the roles that each government level should play. In Australia, the roles of government were handled well in the NCP reform, in terms of what each level did to help meet competition policy targets. The states were then allowed to determine how they implemented the NCP reforms, and they in turn gave flexibility to the individual agencies about how they went about those tasks. Decision making needs to be done at the right level, and all the necessary levels need to be involved and engaged appropriately.

4.6. Economic Regulation

In the field of urban water, many stakeholders consider that the most successful process for enabling reform and embedding the benefits of reform is introducing or strengthening independent economic regulation. Whereas rural water required a combination of catchment planning and economic regulation, the urban water sector has responded well to independent economic regulation. Some regard it as the most powerful of all the reforms implemented over the last few decades—more long-lasting and better understood than corporatization. According to such supporters, if the economic regulation settings are sound, then business or agency management can properly be separated from government direction, which is seen as another positive aspect of such structural rearrangement.

For some, it is questionable whether Australia would have managed its way through the Millennium Drought if all the major utilities had not been reformed and their planning capacities and flexibility had not been enhanced. In terms of readiness for climatic and environmental challenges, all levels and forms of government—including water utilities—must work together and understand their specialized roles. One of the benefits of the NCP reforms was a separation between the policy role (held by government departments) and the delivery role (held by utilities) and oversight role (held by independent economic regulator).

The "business efficiency" reform drivers were to some extent imposed on the urban water sector by the demands of state treasuries for greater efficiencies and cost-recovery within the corporatized utilities. Some of the traditional water utilities had become bureaucratic and inflexible with many layers and entrenched cliques of professional groups performing various roles. Many had to be dragged into a different operating environment in which

efficiency was important and investment funds had to be used as effectively as possible. But the urban water industry, according to some insiders, is now very much driven by the new approaches to efficiency and responsiveness. If one or two of the big utilities undertake successful innovations, most others tend to follow.

Hence, waves of change can be viewed as moving through all the water businesses, except perhaps for the small local authority entities that lack the resources, skills, and political impetus to pursue innovation. By contrast, the big water businesses in the capital cities tend to innovate collectively on the basis of learning and emulation. So whether the issue is cutting losses from water leakage or extending water recycling operations, or developing new tariff charges, initiatives can quickly evolve into a widely shared approach across the country. This suggests that professional confidence can lead toward a more collaborative culture.

4.7. Procurement Practices

In the urban water context in Australia, various forms of public-private partnership—or, more often, forms of outsourcing (procurement contracting)—provided options for engagement of the private sector and demonstrated opportunities for piloting innovation. One challenge in outsourcing to the private sector is how to develop and progress contracts that effectively incentivize operator performance and optimize capital expenditures, but also build in effective procedures to address cases of poor contract performance (Jefferies and McGeorge 2009; World Bank 2014). The Australian urban water sector, like other service delivery sectors, has occasionally utilized procurement models involving contracts with international companies to provide specific technological expertise, but in most cases the state governments have retained public ownership and operation of corporatized utilities. There is a widely held perception that Australia has established pioneering governance structures and public-private collaborative models that embody the best of both sectors. Many utilities in Australia operate according to models that encourage water utilities and service agencies to work together in partnership to solve water supply-related problems (Rouse 2013).

In the early 1990s many of the urban water businesses let out major contracts to the private sector through processes which, according to some accounts, made it difficult for locally owned businesses to make successful bids for the work. Water treatment plants constructed and operated by the private sector (e.g., build-own-operate-transfer [BOOT]) emerged in many parts of the country. The large private water companies that were invited to place bids, often European and multinational, were seen locally as disregarding the likelihood that local water businesses had the expertise, experience, and resources to be competent partners. That apparently caused a great deal of resentment among local private firms for being excluded from contract tendering, when it could have been an opportunity for local companies to improve and undertake projects for less cost or to grow their capabilities.

The initial concerns about international participants held by sections of the local water industry gradually dissipated, and while in practice the companies that secured the contracts were French, European, or American, the bulk of the staff were locally employed.

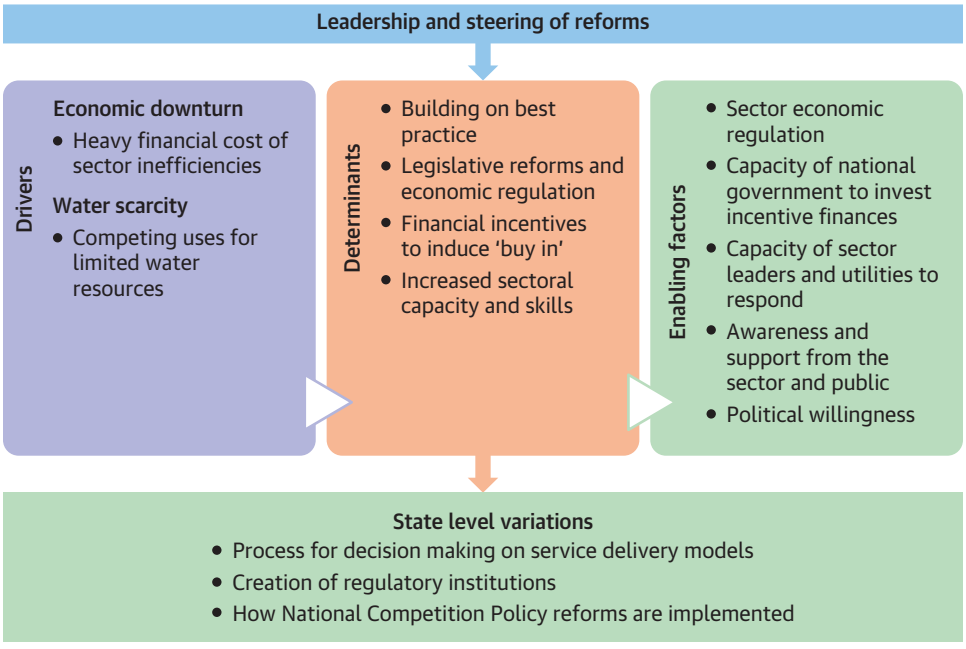
So although some profits would necessarily have been repatriated overseas, the bulk of salaries still went to local Australian staff. Eventually, the industry moved to ensure that, when new projects were contracted out, deals stipulated that a certain percentage of local staff would be employed in the new business venture. As in all businesses, the culture of businesses in the urban water industry has changed over this time. Longstanding engineering-based businesses have gradually morphed into more broad-based, "professionalized," and economically efficient businesses that have a different—arguably more effective—way of evaluating projects and adopting reforms.

4.8. Summary Lessons

This chapter has described how reform measures and approaches were translated into actions. These measures collectively describe the framework in which reform in Australia progressed. A wide range of determinants over time contributed to improved performance and outcomes, including financial and legal incentives, political will, leadership, skill levels, technology, cost recovery models, and paradigm shifts in business operations through an increased customer focus. Collectively, these elements underline the significance of key stakeholders and organizations and their roles at vital stages of the reform process.

Figure 4.1 captures the drivers and determinants for reforms, along with flagging key factors that enable leadership through the reform process and adaptability for implementation at state levels.

FIGURE 4.1. Drivers of Reform



- The role of leadership from individuals and organization has been observed for steering reforms over time. Utility managers and service agency leaders played strategic roles in disseminating initiatives through sector levels, helping certain reform measures play out successfully over the last three decades among water sector bodies, utilities, and communities.
- The COAG-defined institutional reforms increased the efficiency and cost return of urban water utilities, and the way those reforms were worked through the different state water sectors helped to increase the generalist skills and "water knowledge" of utility management.
- Reforms were encouraged by and reinforced increased consumer engagement and public "water awareness."
- Organizational response to reform was driven by utilities' efforts to be efficient and prudent; follow policy requirements; and enhance customer understanding and willingness to pay the full cost of services.

While each of the preceding factors is important, enabling factors, such as the urban water sector economic regulation, drive many disciplines and other processes. In fact, some regard it as the most powerful of all the reforms of the last few decades: more long-lasting and better understood than corporatization. Another enabling factor is the receptiveness of the sector and public at large. Reforms could be achieved only through negotiated outcomes with stakeholders and communities that were politically feasible. The level of receptiveness to such consultation has had implications for how reforms progressed and the pace of reform over time, emphasizing that water reform is an iterative process in which some states could move faster than others, depend on readiness of stakeholders.

Note

1. "The Australian Government has provided financial incentives to states and territories in order to facilitate national reforms. Such payments were widely seen as successful in garnering support for the National Competition Policy (NCP) reforms beginning in the mid-1990s. The logic behind the NCP-related payments was that the reforms would have a significant pay-off in terms of gross domestic product, leading to additional tax revenue which, because of vertical fiscal imbalance, would flow disproportionately to the Australian Government. The pool of available funding was developed with reference to modelling by the Industry Commission, while the National Competition Council made recommendations on competition payments. The NCP-related payments therefore provided both a mechanism for sharing the benefits of reform, and an accountability mechanism, with states and territories 'penalised' where reform commitments were not satisfactorily implemented"(PC 2011, 496).

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Chapter 5 Differentiating Experience of Reforms

Documentation of Australia's reform history includes differentiation across the states, allowing for varying approaches to reform. In other words, nationally agreed policy directions evolved in different settings and with unique challenges among states and territories. This analysis of a national case study of Australia's innovative and wide-ranging reform process recognizes the roles of central, state, and local governments in urban water supply and sanitation services. The range of reforms and how they occurred at different levels and in different locations are summarized in figure 5.1. The analysis of urban water reforms initiated by national agreements in Australia must therefore account for variable implementation by state and local authorities in their respective jurisdictions. It also shows variations between the receptiveness to reform of the distinct jurisdictions and variations in approaches and the pace of reform at different points in time.

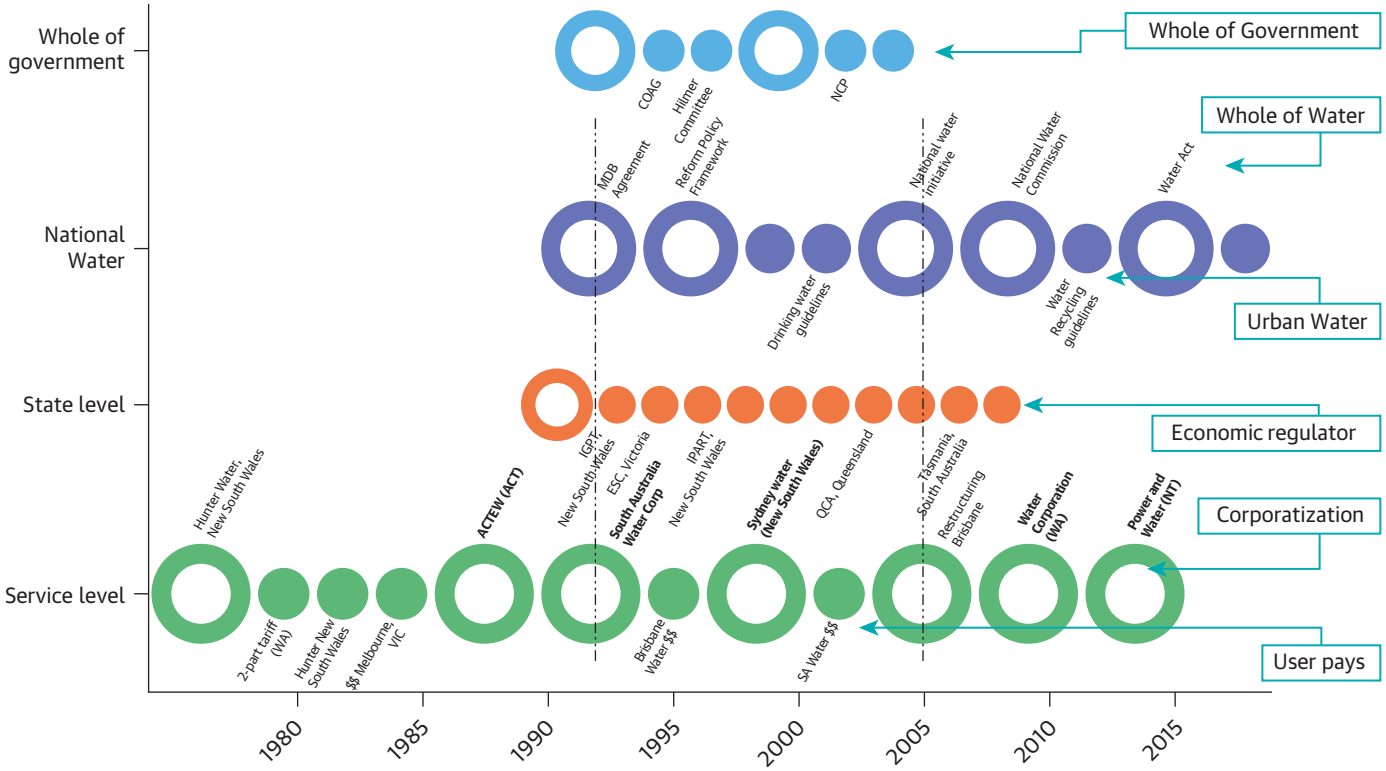
To reiterate the governance framework in a federation, Australia is a commonwealth, or federal union, of six states and two territories, each subnational level having responsibilities for water supply in their respective jurisdictions. The governments of the states and territories are responsible for water service provision through publicly owned utilities and agencies (or through a single integrated entity in the case of Western Australia, South Australia, and the Northern Territory). Utilities owned by local governments provide water services in regional parts of Queensland and in Tasmania. In Victoria, New South Wales, and South East Queensland, state-owned utilities provide bulk water that is distributed to consumers by corporatized utilities owned either by local or state governments (see table 5.2). Each state and territory has a minister responsible for water matters, as is the case at the federal level. As of 2015, the federal Department of Agriculture and Water Resources is responsible for water policies.

Water sector reforms over the last few decades were implemented according to conditions and circumstances in the different states and regions, not in a "one size fits all" approach. Some flexibility was allowed within national agreements for local experts to determine the best means and pace of achieving reform targets. The national water reforms in the mid-1990s had less impact on similar changes underway or already achieved in major urban utilities (especially the case in New South Wales, Victoria, and Western Australia), but the national agreement prompted larger changes in the "slower" states and in regional-based utilities. There were limits to this autonomy, however, in terms of timelines for change and for certain efficiency steps, such as the need for modern water metering (which affected Brisbane and South East Queensland in the early 1990s).

5.1. Amalgamation of Regional Water Utilities

One of the first major sectoral restructuring in the first wave of reforms involved the amalgamation of many smaller water utilities. In states such as Victoria these reforms preceded the national level reforms. Other states, such as Western Australia and South Australia,

FIGURE 5.1. Reform Pathways at Different Levels of Governance



Note: $$ = user pays; COAG = Council of Australian Governments; ESC = Essential Services Commission; IGPT = Interim Government Pricing Tribunal of NSW; IPART = Independent Pricing and Regulatory Tribunal; MDB = Murray-Darling Basin; NCP = National Competition Policy; NWI = National Water Initiative; NWC = National Water Commission; QCA = Queensland Competition Authority.

with their monolithic single utilities, chose not to follow the Victorian model. Tasmania underwent an amalgamation process that reduced its number of small authorities. New South Wales and Queensland still have many smaller utilities operated by local governments, while the large utilities around Sydney and South East Queensland were corporatized and regulated independently. With regard to water supply services, as with other council-dominated services, local governments can be a powerful force (and either a barrier or facilitator of change). This is the case, for example, in Brisbane, South East Queensland, where the city council is the largest local authority in the nation. It was able to protect its territory more than other councils; but when reform eventually came, it came rapidly and professionally. A comparison of restructuring experience in Victoria against the experience in South East Queensland provides insight to amounts of autonomy at the state and local government levels for interpreting national government-driven reforms. New South Wales presents an example of initiating reforms on institutions, policies, and, especially, regulations—the

latter experienced through IPART. (A deep dive of the broad reform experience in New South Wales is presented in part II.)

5.2. Restructuring Approaches in Victoria and Queensland

Reforms have often been driven by the need to respond to unexpected or critical conditions. In Victoria at the beginning of the 1990s, the state's economy was in very poor shape and reeling from recession. The newly elected premier, Jeff Kennett, instigated a rapid rationalization program that included privatizing a long list of state assets and utilities. Water was left to last because of a controversy at the time about the effectiveness of privatization of water in England under Prime Minister Margaret Thatcher. Eventually, while Melbourne's water utilities were being corporatized, they avoided privatization owing to the realization that water is a natural monopoly and a difficult sector into which to introduce competition.

In comparison, reforms moved slowly in Brisbane. Despite perceptions of a "recalcitrant attitude" to external reform agendas, there was a good depth of water sector expertise (technical and organizational) in Brisbane in the 1980s and early 1990s; however, the region lacked political will or committed leadership to move the sector forward. In the mid-1990s, nationally agreed upon reforms helped stir interest in improving the sector's performance in Queensland, and later, the Millennium Drought and greater water scarcity prompted political action at state and local levels.

Similarly, in the late 1990s, Queensland's state-wide bulk water infrastructure utility, Sunwater, was also corporatized and removed from the government department for dam operations and scheme operations, and separated from the policy function in another government department. The most important reform to the water sector in South East Queensland was the formation of the Seqwater Board as a joint local/state authority in the 1990s and its restructuring in 2006 as a state-owned corporation. The Millennium Drought led to significant further restructuring of water sector governance in South East Queensland (Head 2010).[1]

During the reform period of the 1990s, the states were able to do some things relatively easily, but other tasks were much more difficult, and the reasons for difficulty varied. The collective learning about which reform areas were most challenging or intractable was translated into the 2004 Council of Australian Government (COAG) agreement and the National Water Initiative (NWI), and the journey progressed.

5.3. Pricing Reform and Productivity

Prior to reforms, urban water was primarily delivered by local governments throughout Australia. The strong role of local government meant that there was a close link between the cost of local government services (funded by general rates) and the cost of the water supply services. There was a lack of clarity about the distinction between general rates and water

charges, about the composition of those water charges, and about incentives to reduce the cost of providing water to customers in urban areas. Some regions often had a political focus on minimizing costs of local services rather than producing a sustainable risk profile in terms of urban water security.

The financial pressures arising from forecasted increases in water demand, the need for further investment in water storage and water security, and the need for accompanying pricing reforms were not well appreciated in Queensland. Nonetheless, the Brisbane City Council restarted a water metering program and transitioned to fully funding asset depreciation, which were important reform steps. But the opportunities for pricing reform to have an impact on future demand were probably much greater in New South Wales and Victoria, because their rates of population growth were lower than that experienced in South East Queensland. Pricing reform was very effective in Newcastle (in New South Wales) where the Hunter Water Corporation (HWC) board's pricing reform had a huge effect on its demand and future demand forecasts.

During the NCP reforms in the 1990s, Queensland's state government decided that because water delivery was largely the responsibility of local government, the state should pass on the competition policy incentive payments to large local governments that operated major water schemes. The NCP also required the removal of cross-subsidies between customer groups, and the establishment of pricing reform initiatives and water reform policies. Such changes came at a political cost to local government, but the incentives-based nature of the competition payments meant that Brisbane City Council would receive its payment only if it implemented all the elements of the competition policy.

Following the introduction of water metering in the 1990s, there was a very significant change in consumption over the ensuing period, since consumers began to be charged for their volumetric use of water. One of the key changes after 2006 was the introduction of standardized requirements for local governments to introduce more urban water security planning.

While COAG provided the initial national reform framework for adaption to different regional settings, the reforms of the later reform period were still primarily about productivity and cost-efficiency. The main objective was to improve productivity, but this was extended after the Millennium Drought to a concern for water security and effective management of climate variability.

5.4. Aggregation or Disaggregation

Corporate efficiencies were approached in several ways, some involving aggregation and others involving devolved approaches (see table 5.1). In some cases, such as Perth and Adelaide, the size of the entity remained untouched.

While Western Australia's Water Corporation took responsibility for its own efficiency reforms, and retains a large independent operating budget separate from the state's Department of Water, it was still subject to the disciplines of external audit, regulatory, and

TABLE 5.1. Institutional Structure of Water Service Provision in Australia, by Region

Region	Metro	Regional
New South Wales	Sydney: vertical separation between SWC and Sydney Catchment Authority.	Outside of Sydney and Newcastle, services largely provided by LGAs.
Australian Capital Territory	ACTEW AGL is a vertically integrated provider of services.	n.a.
Victoria	Melbourne: vertical separation between Melbourne Water and three horizontally disaggregated water retailers.	In 1994, 140 nonmetropolitan water providers were consolidated into 15 (later 13) state-owned regional urban water authorities providing integrated services.
Queensland	Vertically disaggregated into separate authorities for manufactured water, bulk water, bulk transport and grid management. Ten LGA-owned retailers provide retail services.	With the exception of South East Queensland, largely provided by LGAs.
South Australia	SA Water is a vertically integrated water utility providing water and waste water services.	SA Water provides water services. Sewerage services in nonmetro areas provided by LGAs.
Western Australia	Water Corporation is a vertically integrated service provider to Perth.	Water services provided by Water Corporation or other water boards. Sewerage services provided by some LGAs.
Tasmania	Hobart water services are provided by Southern Water, a vertically integrated water utility.	Historically provided by local governments. In 2009 service provision was amalgamated into three regional utilities supported by a common shared services utility.

Source: LECG 2011, 7.
Note: LGA = local government authority; n.a. = not applicable; SWC = Sydney Water Corporation.

compliance authorities within other branches of the state government. Owing to its scale, though, the Water Corporation largely avoided political interference in its approach to implementing national reform initiatives. Western Australia was similarly well placed to respond to the NWI agenda of improving water resource management and sustainability, given the state's familiarity over recent decades with drought conditions, declining rainfall and inflows, and increasing demand (and persistently high consumption levels) for water. Water agencies' policy responses in Western Australia to these climatic and environmental challenges were fairly typical of the rest of the country, consisting initially of dam construction, but more recently desalination technology, together with successful demand management strategies. The latter were achieved partly through effective consumer engagement campaigns, another measure with which the Water Corporation had long experience dating back to the pricing reforms of the 1980s.

With responsibility for water supply services for most of Western Australia, the Water Corporation (a "great big monopoly" in the words of its former CEO) had for a long time been well placed (in terms of scale) to handle water sector challenges and take a long-term view to water planning and reform. In the 1990s, when the COAG reform agenda appeared, the Water

Corporation had already implemented urban reform initiatives over several years (such as pricing reform and universal metering), but saw the advantage in improving general efficiencies in line with the national agenda. Having a close relationship with the Western Australian state government, but still large enough in size, scope, and skill to act independently, the utility adapted to the public sector push to streamline and modernize agency operations and structures.[2] But other states, such as New South Wales, Victoria, and especially Queensland, had a strong focus on aggregation.

The other major reform agenda during the 2000s was separating delivery roles from policy and regulation. Previously, large utilities such as Melbourne Water were setting a lot of policy: they were self-regulating and delivering supply. Thus, a big driver of the reforms tagged to the NWI agenda was to separate out those operational functions from policy and regulation. Table 5.2 highlights the decoupled roles of economic regulators after reforms.

In the 1990s, the Victorian government introduced comparative competition in which Melbourne had a wholesaler, Melbourne Water, and three retail water companies. But in the following decades, Melbourne's water sector was transformed because of the discipline imposed by the regulatory regime called the Essential Services Commission (ESC), established in 2002. Henceforth, Melbourne Water had to state publicly, through routine reporting, its intentions and call for submissions from stakeholders concerning those matters.

TABLE 5.2. Independent Economic Regulators: Pricing Functions and Coverage, Australia

State and regulator	Pricing functions			Coverage		
	Review	Recommend	Determine	Metro urban	Regional urban	Rural
New South Wales: IPART[a]	Yes	Yes	Yes	Yes	No	Yes[f]
Victoria: ESC[a]	Yes	Yes	Yes	Yes	Yes	Yes
Queensland: QCA[b]	Yes	Yes	No	Yes	No	Yes
South Australia: ESCOSA[b]	Yes	No	No	Yes	Yes	No
Western Australia: ERA	Yes	Yes	No	Yes	Yes	No
Australian Capital Territory: ICRC	Yes	Yes	Yes[c]	Yes	No[e]	No[e]
Tasmania: OTTER[b]	Yes	Yes	No	Yes	Yes	n.a.
Northern Territory: Utilities Commission	Yes	Yes	No	Yes	Yes	No[e]
Australian Competition and Consumer Commission[b]	Yes	Yes	Yes[d]	No	No	Yes

Source: NWC 2011, 20.

Note: ERA = Economic Regulation Authority; ESC = Essential Services Commission; ESCOSA = Essential Services Commission of South Australia; ICRC = Independent Competition and Regulatory Commission; IPART = Independent Pricing and Regulatory Tribunal; OTTER = Office of the Tasmanian Economic Regulator; n.a. = not applicable; QCA = Queensland Competition Authority.

a. Continuing and formalized role in price setting.

b. Undergoing transition arrangements.

c. This power only applies if stated in Terms of Reference issued by the minister.

d. Applies to larger infrastructure operators.

e. Sector is relatively small in this jurisdiction.

f. Only for state water for bulk water services and for water planning and management activities, with privately owned irrigation authorities not currently subject to state-based price regulation.

In that decade regulators in all states adopted broadly similar reporting requirements for the agencies and corporatized entities of state governments.

Victoria's government (like others) set obligations for utilities in terms of levels of service and asset maintenance, and utilities had to be publicly accountable for efficient investment in system maintenance. That was a significant change from earlier ad hoc financial processes, so that by the time of the Millennium Drought, states were accustomed to discussing the need for big solutions. Because leaders had decision-making experience in times of seeming crisis—and with coordinated planning and response—they were better prepared to respond when faced with the next crisis or reform imperative.

In his deep-dive analysis of the path of urban water reforms in New South Wales, Eric Groom outlines key factors behind models of urban water service delivery in different jurisdictions:

> Each different model [of water business] can be made to work in practice. The Sydney Water Corporation (SWC) model needs strong contracts and monitoring of water quality to maintain alignment of accountabilities and responsibilities. This has been achieved through the strengthening of the licencing arrangements. However, the different sizes and structures of the metropolitan water agencies regulated by IPART limit the value of cross-sectional peer benchmarking. Nevertheless, in past reviews IPART has used comparison of trends in costs over time. For its review of the performance of the NSW State-Owned Corporations, IPART estimated the trends in productivity of time and undertook comparative analysis of these trends for SWC and Hunter Water Corporation (HWC), and individually compared the performance of each for various cost and service KPIs against their peers in other states. Whilst the NSW model does not prohibit benchmarking, one of the strengths of the Victorian model is that it facilitates comparison by competition. According to the National Water Commission (NWC):
>
> *In 2007, the Victorian ESC noted that comparative competition had worked to improve performance and in particular to "encourage management teams to innovate to improve service delivery relative to other businesses." Anecdotal evidence (sourced from personal correspondence) suggests that the managers of the Melbourne water retailers pay significant attention to their relative performance. The performance data also appears to support this contention. In the years following the disaggregation, the performance of Melbourne retailers improved significantly on many measurable customer performance metrics, including customer complaints, water quality compliance and the speed with which unplanned interruptions and sewer spills were rectified.*
>
> The public performance reporting under the Essential Services Commission (ESC) focuses on various dimensions of service outputs and quality, rather than measures of cost and efficiency. This limits its value in price-setting and in its determinations of prices for the three Melbourne water suppliers as the ESC has not used formal comparative benchmarking. However, ESC is undertaking a review of its approach to

regulating water prices, and Frontier Economics has recommended that it increase its use of benchmarking. In Queensland, the reversals made to previous reform decisions reflect the unrest within the industry about the initial reforms, which relied on minimal consultation with the local government and the community. Hence, it is difficult to draw conclusions about the effectiveness of the model because the model only operated for a short period and the subsequent changes may have reflected deficiencies in the reform process rather than in the model itself.

5.5. Summary Lessons

- Comprehensive reforms in term of scale (across states) and scope (from restructuring, efficiency, and sustainability) could be absorbed effectively only in jurisdictions that were receptive to changes in service operations.
- Government policies and sector-negotiated agreements with state water stakeholders and urban communities needed to be politically feasible—or at the least "marketable"—and designed to deliver substantial changes in water management arrangements and structures.
- Incentives were required to bring on laggard states and regions.
- Given these opportunities and limitations in how changes could be implemented in the Australian context, reform agendas needed to be established through collaborative settlements among senior sector figures and state leaders in the different jurisdictions.

Notes

1. See chapter 8.6 for additional structural differences between Melbourne's and Brisbane's sectors.
2. The Water Company's relationship with the state was another feature that makes it (and the state more generally) something of an outlier compared to others in terms of water governance reforms.

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Chapter 6 Key Messages from National-Level Reforms

> Australia has been implementing a program of reform to change the way water is used and managed across the country for over thirty years. Australian water reform has been an evolving journey, striving to create a water sector that is economically and environmentally sustainable, that provides a secure basis for future investment, and that yields high returns to the community. ... While Australia's water reform journey is far from finished, our experience may provide valuable ideas for other countries as they tackle their own water management challenges. (*Doolan 2016, 5*)

The type of recent reforms seen in Australia fundamentally changed how water sector policies were designed and implemented (OECD 2012). It is important to gauge whether there is a consistent appetite for such significant reform, or whether reform is more likely to follow an incremental process of refinement over a longer period. However, it is equally important to identify differences between the Australian case and other contexts. For example, two contextual factors that greatly assisted in the reforms in the Australian water sector were the establishment of COAG in the early 1990s, and the relatively small number of states and territories that needed to consent to national strategic agreements. The role of COAG was critical for bringing all states on-board for reform in Australia. The style of federalism in Australia is sometimes described as "executive federalism," and is facilitated by negotiations and coordinated agreements between the leaders of a relatively small number of jurisdictions.

This historically focused account of Australian urban water reform will help policy makers understand (a) the evolution of contemporary water institutions, (b) their role in shaping reform initiatives, and (c) lessons that can be applied to water-related development elsewhere. This report has considered and explained changes in recent decades in different locations and levels of urban water sector governance to better understand the following:

- The genesis of reforms and drivers that triggered them
- How and when structural shifts occurred, and the extent that federal and state interventions (policies or state agreements) and market factors influenced shifts
- The range and role of efficiency measures from governance perspectives (e.g., adoption of corporate governance practices, benchmarking, and tariff structures)
- Changes in skills and capacities required by leaders and administrators across the sector (typically "managerial" more than technical skills, seemingly a product of commercialization and corporatization processes)
- The relevance of different interventions at separate stages in the longer nationwide reform process.

Reform in the urban water sector is an iterative process that comprises progressive steps. This process has implications for how water reform can be pursued and can be expected to unfold. The process requires a journey of continuous improvement at each of those steps,

so that reforms are seen to achieve and build on successes and be reexamined over the course of time. This characteristic underlines the importance of the principles underpinning the reform process, especially transparency, effectiveness, and engagement, and the need for wide acceptance and "buy-in." Hence, water reform is a long-term undertaking in which changes need time to take hold and win support. Leaders need to address and resolve issues while working at a pace that can be managed transparently by governments and sustained by communities. At each step along the journey:

- Work is built on what has already proved effective.
- The prevailing political context provides opportunities.
- Implementation issues are identified and solutions are framed.
- Stakeholder and community agreement are required and negotiated.
- As community members see benefits of change, the drivers for the next phase of water reform are set in place.

This reform process underscores that there are new challenges emerging (or reemerging) in Australia's urban water sector. An understanding of these—and past—challenges can promote an understanding of the breadth of issues relevant to water reform in different contexts.

The World Bank operates in countries with quite different enabling environments and economic contexts than in Australia. Low- and middle-income countries (LMICs) often face the following types of challenges in the water sector:

- Insufficient financial resources to make the investments required to increase access and improve service delivery
- Lack of incentives on the part of service providers to improve service quality and efficiency
- Inequity in coverage between rural and urban areas
- Challenges with ability or willingness to pay (at least once connected to a network)
- Inability to sustain service level improvements
- In many cases, very constrained water resources, or damaging floods at the other extreme

Contextual factors that were important in Australia may or may not exist in Bank client countries. Nevertheless, being cognizant that there are really no "best practices" (and the World Bank *World Development Report 2017* encourages development practitioners to move away from this notion), and noting that each enabling environment is different, policy makers can learn lessons from the reform process in Australia's water sector. In particular, countries organized in the federal-state model can learn from the reform process in Australia, which has involved mechanisms and practices enhancing commitment, coordination, and cooperation from both the federal and state levels. Further, Australia's sector is dominated

by corporatized state-owned enterprises; therefore, there are good lessons for LMICs that rely heavily on publicly owned utilities, including on how to incentivize, regulate, and monitor them. The common process steps observed from the Australian experience are distilled in this report, and may help inform development practitioners seeking to take a similar reform journey toward greater efficiency and effectiveness in the urban water sector.

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Part II Case Study of New South Wales

Eric Groom

Chapter 7 Summary and Structure

7.1. The Urban Water Reform Story in New South Wales and Australia

Part II traces the reform of the urban water sector in New South Wales since the mid-1980s in the context of the broader national microeconomic reform agenda in Australia. It is a complex story illustrating how multiple factors drive reform and affect its progress. The evolution of the sector reflects changing priorities and specific political-social factors, and can be divided into the following periods:

- **Pre-1980s.** Water was viewed as a "social service" with poor financial performance, inefficient pricing with extensive subsidies, and a tax component
- **1980s**. Initial reform steps in the water sector were led by the Hunter Water Corporation (HWC),[1] supported by the initial steps toward commercialization and corporatization
- **1990s**. The New South Wales government continued its commercialization and price reform within a bipartisan national agenda on microeconomic reform to improve productivity
- **Late 1990s**. Focus was on improved financial performance and service standards framework
- **Mid-2000s.** A prolonged drought necessitated an improved security of supply, while the reform of the sector entered the next stage: promotion of competition

The urban water sector was transformed from a heavily subsidized and engineering-focused industry subject to strong political intervention and control, into a competitive and financially secure industry, under the management of skilled boards providing services focused on customer needs at prices that allow it to recover its costs and achieve a commercial return on investment (ROI). The complexity comes from the interplay between the following:

- Institutions, policies, and regulations that create the environment within which managers and organizations operate
- Decisions of managers, policy makers, ministers, and regulators given the framework
- Specific events and challenges (e.g., financial constraints, improving service quality) or specific crises (e.g., water shortages or water quality alerts) that influence the development of the institutions, policies, and regulations, and the decisions made within this framework

In practice, reform needs a driver. The early reforms in the 1980s were driven by individuals dedicated to pursuing organizational and economic efficiency despite policies, regulations, and institutions that provided weak incentives for such goals. The success of these individual-driven reforms supported subsequent policy and institutional reforms initiated

at the state level, which were primarily driven by external events (i.e., perceived financial crises) and reform-focused governments. The national reform agenda, and accompanying changes to the institutions, policies, and regulations, is best understood in the context of a national concern about poor productivity growth and the performance of the national economy as a reform driver.

A focus on national policy frameworks rather than the history of the implementation of reforms may create a perception that the Council of Australian Government (COAG) Water Reform Framework and the National Competition Policy (NCP) (National Competition Policy Review 1993, known as Hilmer Report) led the way. In fact, important aspects of the national agenda followed earlier reforms in some states and utilities (e.g., HWC), while other aspects preceded reforms in some states and utilities. Indeed, in many respects New South Wales was an early reformer, moving in advance of the agreement on the national reform agenda. For example, New South Wales established the Independent Pricing and Regulatory Tribunal[2] (IPART), an independent pricing regulator, in 1992, prior to the agreement on the national reform agenda. These early reforms, in turn, may have facilitated the national reform process.

In summary, the national reform agenda had a very important role in the urban water reforms. However, the influences went both ways: from the interplay between utilities and states to the national reform agenda, and from the national agenda to the interplay between utilities and states, with the importance of each varying across states and over time. The other important factor in successful reform is a crisis or sense of urgency to mobilize efforts and overcome vested interests, such as the role of the drought in promoting alternative water sources and servicing solutions and sharpening focus on price signals.

7.2. Relevance for Other Jurisdictions

The challenges facing the reform of the urban water sector in New South Wales were different from those facing urban water sectors in many other jurisdictions, especially in low- and middle-income countries (LMICs). New South Wales already had almost universal access to improved water and sanitation services, and even in the early 1980s the utilities at least covered their operating costs. The priorities were price reform, improved efficiency, and the achievement of commercial rates of return. However, there are aspects of the reform process that are relevant to a broader range of jurisdictions:

- Importance of specific events and individuals in the reform process
- Role of national government in a federal system to reinforce and promote reform through the use of its coordinating powers and fiscal rewards and sanctions
- Importance of separating and clearly delineating service delivery, policy, and regulatory functions, and establishing appropriate institutional arrangements. Crucial to this is enhanced transparency of objectives and instruments. New South Wales established

a transparent independent regulator focused on economic regulation, with separate budget-funded subsidies determined by the government to achieve social policy goals. However, this institutional arrangement may not suit other jurisdictions

- Challenge of establishing commercial utilities with strong efficiency incentives, and embedding and maintaining the commercial focus and managerial independence

7.3. Changes in Sector Structure and Institutions

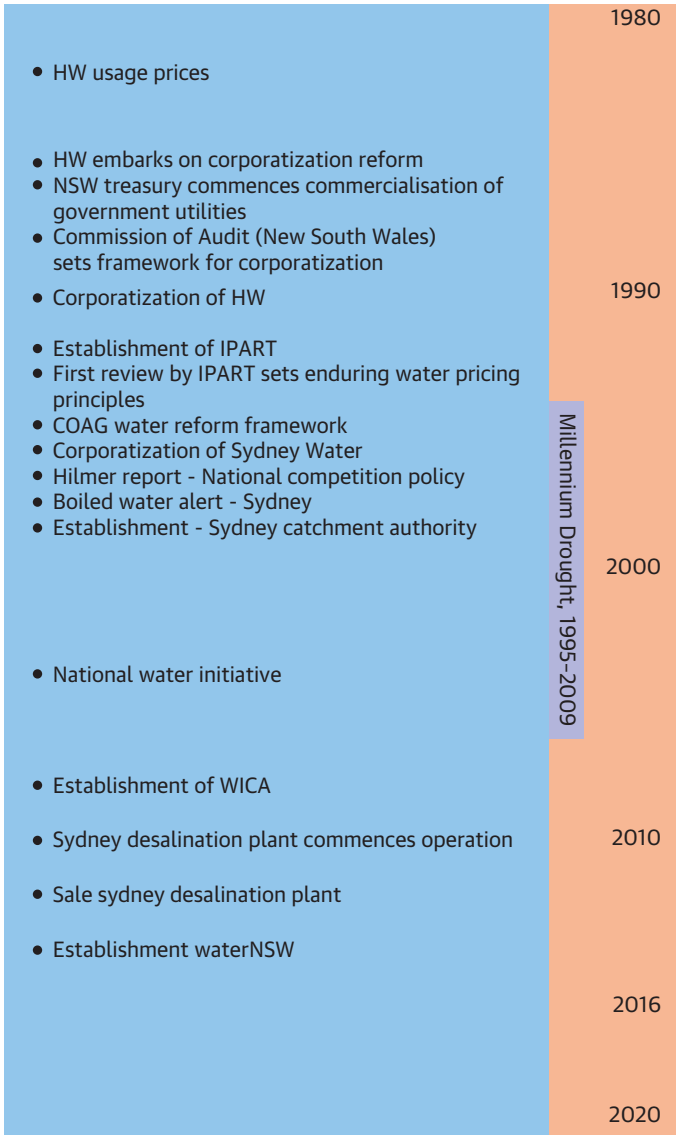
Table 7.1 compares the sector's current structure and governance with that at the commencement of the reform process. It demonstrates how the various regulatory and

TABLE 7.1. Urban Water Sector in New South Wales: Before and After Reforms

Institutions	Before (mid-1980s)	Now
Service delivery	Water boards (vertically integrated) government agencies reporting to Portfolio minister	Corporatized, commercial boards *Sydney:* WaterNSW and Sydney Desalination Plant (bulk water), Sydney Water Corporation (water delivery, sanitation, and stormwater) *Hunter:* HWC (vertically integrated)
Water resource planning	Water boards	Metro Water Directorate
Urban planning	Water boards and Department of Housing	Department of Planning
Financial supervision	Treasury: net funding and CAPEX approved through state budget	Shareholding ministers advised by Treasury
Funding	Loans approved by Treasury raised by Water boards	TCorp advises on funding strategy and raises loans. Stand-alone debt rating
Policies		
National Water Reform Policy	n.a.	National policy framework agreed by federal and state governments
Financial objectives	OPEX break even, CAPEX funding determined by government through budget processes	Comprehensive set of commercial policies and targets. Replicate private sector governance
Water resource management	Water boards	Metro Water Directorate
Urban development	Water Boards and Department of Housing	Minister and Department of Planning
Social policies and subsidies	Water boards and Portfolio minister	Portfolio minister through commercial service obligations
Regulation		
Pricing	Annual prices set by minister and Cabinet on advice from Water boards	Independent incentive-based regulation. Multiyear tariffs set by IPART
Water quality (set and monitor)	Water boards	Department of Health sets and monitors compliance
Environmental (set and monitor)	Water boards and state Pollution Control Commission	EPA sets and monitors compliance.
Service quality	Water boards	Standards set in licenses, monitored by IPART
Licencing	None	Comprehensive licenses supervised by IPART

Note: CAPEX = capital expenses; EPA = Environment Protection Authority; IPART = Independent Pricing and Regulatory Tribunal; n.a. = not applicable; OPEX = operating expenses.

FIGURE 7.1. Water Reform in New South Wales in the Context of the National Reforms, 1980s to Present



Note: COAG = Council of Australian Governments; HW = Hunter Water; IPART = Independent Pricing and Regulatory Tribunal; WICA = Water Industry Competition Act.

policy responsibilities have over time been separated and made more transparent. The other key theme is the commercialization of the sector.

These changes have occurred in various steps, as shown in figure 7.1.

7.4. Reform Framework in New South Wales

The framework for improving performance has revolved around (a) clearer policy and operating framework for the sector; (b) clear commercial objectives for the service providers aligned to the framework; (c) sector restructuring, a stronger role for the private sector, and facilitation of competition; and (d) "depoliticization" and reform of pricing and its regulation.

In principal, this is a coherent package that strengthens the incentives of service providers and aligns these to the objectives for the sector. However, it has evolved nonlinearly over more than 30 years rather than as a planned straightforward process.

7.4.1. Policy and Operating Framework

The major urban water providers, Sydney Water Corporation (SWC) and Hunter Water Corporation (HWC), operate under a mature policy and licencing framework that reflects their economic, social and environmental importance. This framework is, in principle, largely consistent with strong separation between commercial and social policy goals. While initiatives at the utility and state levels preceded the national reform agenda, the latter has supported its ongoing development, entrenchment, and expansion to other major urban areas and beyond. The National Framework comprises the NCP and water-specific reforms. The NCP includes these key elements:

- Commercialization and, where appropriate, regulation of government-owned utilities and other government-owned businesses
- Creation of a level playing field for government-owned and privately owned business (e.g., equal treatment for tax and competition policy)
- Establishment of independent price regulation and price reform

- Promotion of competition where possible, facilitated by access to essential monopoly facilities (e.g., pipes and wires) where necessary
- Competition payments to the state governments, conditional on compliance with the requirements of the NCP

Competition payments were an important part of ensuring the effective implementation of NCP on a national basis. These are payments by the commonwealth to states and territories that make satisfactory progress with the implementation of the NCP and the related reforms in electricity, gas, water, and road transport. The progress in implementing the reforms is assessed by the National Competition Council. Within the NCP, water-specific obligations and guidelines were established that covered, for example:

- Reform of the sector and its commercialization
- Asset valuation, commercial targets for revenue, and regulation of water tariffs
- Resource planning and water sharing rules
- Quality standards for water and wastewater discharges

Within New South Wales, the framework for setting and monitoring compliance with health and environmental standards has become more robust. Licenses have been used to (a) bring together and strengthen the requirements for, and monitoring of, compliance with the health and environmental standards; (b) specify requirements for stronger asset management planning; (c) set customer service standards such as supply continuity, water supply pressures, and overflows; and (d) specify other policy requirements regarding connection of unconnected customers, water efficiency targets, and greenhouse gas emissions

IPART was given responsibility for monitoring compliance with the licenses in 2000[3] and has established a risk-based approach to monitoring and auditing compliance. Tension has emerged at times as to (a) whether environmental standards are moving ahead of the community's willingness to pay for these higher standards, (b) whether environmental goals are being achieved through the most efficient means (e.g., are higher standards on discharges by the major water utilities being used when there are more cost-effective options to improve water quality in the receiving waterways).

7.4.2. Commercialization and Corporatization

The New South Wales government began developing a more commercial policy framework for its businesses in the mid 1980s. Commercialization and corporatization was underpinned by five key principles for government-owned businesses:

- **Clear objectives.** Providing management of government businesses with clear commercial objectives (i.e., removing or isolating social and regulatory objectives that may conflict with the commercial objective)

- **Managerial authority.** Ensuring key internal operating decisions are made by managers with incentives to maximize the value of the firm (rather than through externally imposed controls)
- **Performance monitoring.** Subjecting government businesses to rigorous, independent monitoring and assessment of financial performance
- **Rewards and sanctions.** Establishing performance-related managerial rewards and sanctions
- **Competitive neutrality.** Removing special advantages and disadvantages that apply due to government ownership, and preventing the abuse of any market power

Initially this involved (a) setting commercial dividend and rate of return targets, (b) establishing the government guarantee fee to equalize the cost of debt for government businesses with their private equivalents, and (c) increasing the autonomy and accountability of the businesses. The process accelerated following the Commission of Audit established by the Greiner government in 1988, and HWC was corporatized in 1991. It was further complemented by other policies such as the following:

- A more comprehensive shareholder monitoring and reporting framework, including agreement on a Statement of Corporate Intent establishing the performance contract between the shareholding ministers and the state-owned corporation (SOC)
- Financial distribution and capital structure policies that set the framework for the financial management of the SOCs
- A tax equivalent regime that required the SOCs to pay to the New South Wales government the equivalent of the company tax payments a private sector business would have had to pay to the commonwealth government if they were a private company[4]
- The Community Services Obligations Policy (1994) that provided for the separation of commercial and policy objectives and the transparent delivery of social policy objectives on a commercial basis (New South Wales Treasury 1994)

There are two key issues in the integrity of the SOC model—the strength and respect for the barriers to ministerial and department interventions, and the strength of the ownership supervision and monitoring. Corporatization seeks to do the following:

- Mimic the incentives and governance structures of private firms so as to strengthen the incentives for management and staff to pursue efficiency and financial goals
- Better align the incentives of management with that of the government as owner of the businesses on behalf of the community

However, there are practical limits to this. Remuneration for senior executives continued to be lower than that of private sector equivalents. While bonuses are paid, they are smaller than the private sector equivalents, and managers cannot participate in share

schemes that allow alignment to the longer term interest of the firm. Finally, most senior executives and CEOs were appointed from within the public sector, which is indicative of a segmented market for managers. Hence, the incentives for managers of SOCs to improve financial performance and efficiency are not as strong as for their private sector counterparts.

In its 2010 *Review of the Productivity Performance of State Owned Corporations*, IPART concludes that "the current framework addresses or seeks to address the most important factors considered necessary to ensure that state owned businesses have the incentives and conditions to operate efficiently, and is based on sound principles." Yet "the current arrangements for implementing this framework are not always consistent with these principles" (IPART 2010b, 67). IPART found shortcomings in the practical implementation of the SOC model in regard to both the strength of the ownership supervision and monitoring and the barriers to intervention. These findings illustrate one of the key learnings from corporatization: the principles are sound and increase the probability of better performance if well implemented, but good implementation is challenging, and continued effort is required to avoid the gradual erosion of the model.

7.4.3. Structure of the Urban Water Sector

Historically, urban water businesses in New South Wales were vertically integrated, performing functions of catchment management, storage operation, trunk transmission, distribution, and supply to end customers. The past 20 years has seen changes in the structures of urban water suppliers in a number of regions and states, including Sydney Water Corporation (SWC). The models for the structure of the sector vary between and within states, and the evolution of sector structures is, to a degree, specific to the circumstances and history of each utility.

In SWC's case, bulk supply was separated out to increase the clarity of responsibility and accountability for the water quality. This action took place as a result of a problem with water quality that meant SWC's customers were required to boil their drinking water for an extended period. Subsequently, the Sydney Desalination Plant (SDP) was initially constructed by SWC and then privatized (see Box 7.1). The earlier separation of bulk water in Melbourne was, in part, driven by the desire to create comparative competition between retail suppliers and, in the longer term, possibly promote actual competition. The restructure in Queensland had the objective of improving the security of water supply. Thus, the structures can be seen to reinforce and strengthen incentives to address aspects of quality, efficiency, and security of water supply.

7.4.4. Increasing Role for the Private Sector

After a false start with a proposal for third-party access to SWC's sewerage network to allow a new entrant (Services Sydney) to provide retail sewerage services to end customers,[5] the role of the private sector and the scope for competition has increased since 2008,

BOX 7.1. Managing Water Scarcity and the Sydney Desalination Plant (SDP)

During the early 2000s, a severe drought (the "Millennium Drought") affected most of South East Australia, creating concerns that Sydney could face severe water shortages. The options to address this included the following:

- Scarcity pricing (i.e., higher usage charges as water scarcity increases)
- Water restrictions and water efficiency programs and subsidies
- Investment in new capacity such as desalination plants

Water restrictions were commonly used to help manage water supplies during drought periods and had strong community support. Economists correctly pointed out the substantial welfare losses from the use of restrictions rather than scarcity pricing, but New South Wales (and other governments in South East Australia) committed to new desalination plants as "insurance" for water security.

The construction of the SDP has been a controversial issue, especially as the drought broke very soon after the government committed to its construction. Planning for the construction of the SDP was taken to the point of commitment to build, and this commitment was not to be made until dam levels fell to 30 percent. However, the government committed to building the plant when dam levels fell to 38 percent. Desalination is expensive, and the construction of the plant resulted in significant increases in water charges, but the SDP is now in long-term shutdown because of high dam storage levels. This raised questions about the decisions to build the plant.

when the licensing framework under the Water Industry Competition Act (WICA) was established.[6] WICA provided for the licencing of new suppliers of water and wastewater services within the operational territories of SWC and HWC, and the establishment of a "negotiate and arbitrate" third-party access regime for declared transportation infrastructure (or infrastructure subject to an approved voluntary access undertaking). Under this regime, prices are not established upfront, but negotiated subject to access pricing principles.

The government required that the pricing of access to existing infrastructure had to be consistent with the maintenance of postage stamp pricing (i.e., retail prices for the incumbent that were the same across its service territory). In its current review of wholesale prices, IPART has indicated it prefers retail minus prices (in which the minus equals the costs of a reasonably efficient competitor of providing the services from wholesale purchase to end use consumers) (IPART 2016a).

Most of the 22 private service providers licensed under WICA provide recycled water for commercial and residential developments. These are mostly small local systems

serving new developments within existing commercial or urban areas and new greenfield developments on the fringe of Sydney. The largest increase in private participation in the sector came from the sale of the SDP to the private sector. The easing of the risk of water scarcity indirectly led to the review and proposed removal of the requirement in WICA for new entrants to source their water from new additional sources. This may increase the opportunities for larger scale private sector participation in the future.

7.4.5. Independent Price Regulation

New South Wales was the first state to establish independent price regulation in 1992, when it established the Government Pricing Tribunal (renamed the Independent Pricing and Regulatory Tribunal [IPART] in 1996) to regulate the prices of the government-owned electricity, water, and transport businesses. This preceded the national reforms, and its objectives were to (a) depoliticize utility pricing and reduce or remove cross-subsidies, and (b) promote efficiency improvements and support the commercialization of the utilities.

Regulation can help improve efficiency by (a) ensuring prices better reflect costs and promote efficient use of scarce resources, (b) setting efficiency benchmarks that provide a transparent target for more efficient service delivery, and (c) setting a "hard" budget constraint that reinforces the incentives within the governance regime for more efficient service delivery.

IPART established its first multiyear price control for SWC in 1993. The prices are adjusted annually using a CPI-X formula, in which X is set to equate expected revenues to forecast efficient costs. The earlier reviews focused on removing cross-subsidies, establishing usage-based pricing to better signal the economic value of water resources, and setting firm cost reduction targets. These reviews were based on strong economic principles but relatively high-level, simple analysis. Over time, the basis for setting prices became more transparent and certain with the adoption of the "building block" approach to the determination of revenue requirements.[7] It also saw the development of more sophisticated and complex analysis, and the more thorough application of the pricing principles established in the early review to all areas of pricing.

IPART has made its approach to price regulation clearer through publications on the consideration of the equity, environmental, and financial objectives (IPART 2010b; 2011a; 2013.). While IPART has been conscious of removing impediments to better environmental outcomes consistent with economic efficiency, it has not sought to intrude into environmental regulation. IPART has, however, expressed the view that environmental standards set by the environmental regulator should be consistent with the community's willingness to pay. IPART sought to set clear limits to the role of price regulation in the pursuit of equity objectives, arguing that in many cases instruments directly within the scope of government policy

provide better means of achieving these objectives. For example, rebates to reduce the cost of water services for vulnerable households are set by the government, rather than IPART, and are funded from the government's budget, rather than cross-subsidies from other customers.

7.5. Reform Outcomes

While difficult to define and measure, the cultures within HWC and SWC have changed fundamentally from engineering-focused organizations to commercially oriented businesses concerned with delivering not only essential services but also economic and financial outcomes. An example of this is the more sophisticated and dynamic, risk-based approach to CAPEX (capital expenses) planning adopted by SWC. Both SWC and HWC now place greater emphasis on understanding their customers' expectations and preferences in investment and service decisions as well as pricing proposals. More directly measurable outcomes are pricing reform, improvement in profitability and the capacity to finance investment, and improvements in efficiency.

Property tax components of charges and free water allowances have been eliminated, and cross-subsidies between and within customer classes have been largely removed. Virtually all customers[8] pay the same usage charge, which reflects marginal costs, providing appropriate economic signals for the use of water. Fixed charges, which ensure that the revenues match the total efficient costs of supply, are set on a common basis for all customers and ensure that significant cross-subsidies have been eliminated. When the government committed SWC to the construction of the SDP to improve water security, prices were able to be increased by 40 percent over four years to ensure that water consumers paid the efficient costs (including a commercial return on investment) of the improved security of supply.

The level of profitability and dividend payments to the government have increased, doubling for SWC over the 10 years to 2014-15. In setting prices, IPART includes a commercial return comparable to that of a private firm facing similar risk, and assesses the financability of the utilities using commercial benchmarks. In 2015, the stand-alone credit rating for SWC was increased from Baa2 to Baa1 (equivalent to BBB+). While consistent, reliable estimates of the efficiency of SWC and HWC covering the whole period are not available, various indicators show the following:

- HWC and SWC have achieved substantial increases in labor productivity. For example, in the period 1996-2009 both businesses achieved improvements in labor productivity of around 100 percent.
- Reflecting this significant reduction in OPEX, benchmarks have been achieved, and both businesses now compare well with their peers.

Estimates of total factor productivity (TFP) do not provide a clear trend. While measured TFP declined by 14 percent in the period to 2009, this did not take into account the

improvements in the quality of the services flowing from investments to meet higher effluent standards or the increase in security of supply of water.

7.6. Structure of Part II

The remainder of part II is set out as follows. Chapter 8 provides context for the study and sets out the sector objectives and current structure. Chapter 9 outlines the framework for improving performance in the sector. There are four key elements to this: (a) clearer policy and operating framework, (b) clearer objectives for service providers and their corporatization, (c) sector restructuring and strengthening the role for the private sector, and (d) de-politicization and reform of pricing. This has evolved over time, and the sequencing responded to specific circumstances.

Chapters 10-15 examine the evolution of the framework elements set out in chapter 9 over time. Chapter 10 sets out the current policy and operating framework, how it has evolved over time, and the key issues for the future. Chapter 11 sets out the objectives and commercial operating framework for the government-owned service providers, how it has evolved over time, and the key issues for the future. Chapter 12 discusses the increasing role of the private sector and competition in New South Wales, how it has evolved over time, and the key issues for the future. Chapter 13 discusses the management of scarcity, including through pricing, and the decisions to invest in desalination plants as insurance against scarcity. Chapter 14 sets out the approach to regulating prices, how it has evolved over time, and the key issues for the future. Chapter 15 summarizes the current performance of the sector and the extent to which it has improved over time. Chapter 16 provides concluding comments on the lessons from the reform of the sector.

Notes

1. The Hunter Water Board (now Hunter Water Corporation) was the first water supplier to prioritise usage-based pricing in the mid-1980s, and was the first water business corporatized in New South Wales.
2. Originally established as the Government Pricing Tribunal (GPT) of New South Wales, it was subsequently renamed IPART when its functions were extended to cover privately owned gas utilities in 1996.
3. On November 1, 2000, the Independent Pricing and Regulatory Tribunal and Other Legislation Amendment Act 2000 came into effect. The Act conferred on IPART regulatory (e.g., making recommendations on licenses) and license auditing functions. Prior to that time the license regulator administered the regime.
4. Under the Australian Constitution, state-owned entities such as the SOCs were exempt from company tax.
5. Services Sydney proposed to provide a sewerage retail, collection, and disposal service to end use customers, using SWC's network, and extract the sewage before the sewage treatment plants to use in its production of recycled water. There were two potential sources of revenue for Services Sydney: retail sewerage charges and proceeds from its sale of recycled water.
6. The WICA 2006 commenced on August 8, 2008.
7. Under the "building block approach" the revenue requirement is built up from the forecasts of efficient costs: i.e., operating expenses (OPEX), return of capital (depreciation and renewals), and return on capital. The latter two components are based on the regulatory asset base, which includes the forecast-efficient CAPEX. Productivity gains are incorporated in the forecasts of efficient costs, and the control formula takes the form of CPI-X in which X is determined to align forecast revenues to the forecast-efficient costs.
8. Except for industrial customers requiring unfiltered water.

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Chapter 8 Context

Chapter 8 provides the context for this review by describing the objectives and structure of the New South Wales water sector and the environment in which it operates. The basic objectives (the supply of safe and secure water and wastewater services that manage a scarce resource and contribute to economic and social development) are common across countries, but there are important differences in priorities and context. Resource and environmental management is particularly important in Australia, given its dry climate, frequent extended droughts, and sensitivity of receiving waters. However, access to water and sewerage services is less important than in other countries, given the existing near universal access to water in inhabited parts of Australia.[1]

Australia has a federal government structure, yet the state and local governments hold primary responsibility for the provision of water and wastewater services. In recent years the commonwealth has taken a stronger policy reform and coordination role in the water sector, primarily through the Council of Australian Governments (COAG)[2] and subsidiary intergovernmental entities. Drivers for this were the need to better manage resources shared across states and to improve economic performance. The Murray-Darling Basin covers much of South East Australia and spans four states, and coordination of the management of this key resource is essential. However, improving the performance of urban water suppliers was also an important part of the microeconomic reform agenda.

Historically, urban water businesses were vertically integrated, performing the functions of catchment management, storage operation, trunk transmission, and distribution to end customers. Over the past 20 years this structure has changed in Australia, yet there is no standard model in place. Instead, the evolution of the structure is to a degree specific to the circumstances and history of each utility. One important element in recent sector structure evolution has been the need to develop additional supply sources or promote reuse and water conservation to enhance security of supply.

This circumstance-specific evolution resulted in a mixture of organizational and ownership structures in the sector. In some areas, such as Newcastle (the second largest city in New South Wales), the utilities are vertically integrated from dams to wastewater discharges. In other areas, such as Sydney, bulk water supply function is separate from distribution and retail supply of water, and there is significant, and growing, private sector involvement.

8.1. Sector Objectives

Objectives of the water sector in New South Wales are to (a) ensure the security and quality of water supply for domestic, industrial, and agricultural use, and ensure affordable access to water and wastewater services; (b) ensure the sustainability of water resources (extraction and supply, and discharge into receiving waters); (c) promote efficient supply and use of water and sanitation services; (d) ensure the provision of water and wastewater services is

financially sustainable, including a commercial return on assets for the state-government owned utilities (Sydney Water Corporation [SWC] and Hunter Water Corporation [HWC]); and (e) support economic and social development, including efficient urban development.

While there are common elements in sector objectives across nations, both low- and middle-income countries (LMICs) and high-income countries (HICs), there are also important differences that must be remembered when considering case studies such as this.

The broader health and community development benefits of improved water and sanitation services are widely recognized. Therefore, focus is put on achieving high levels of access to these services, and ensuring that the water provided meets minimum health standards and receiving waterways are protected. In New South Wales, very high levels of access to water services do not provide the challenge for the sector that a lack of access does in other countries.

While security of supply of water is a common international objective, it has been a more pressing objective in New South Wales and across Australia. Not only is Australia a very dry continent but it is also susceptible to additional long droughts lasting for several years. Furthermore, rainfall appears to be reducing and droughts becoming more frequent. Hence, security of supply is a major challenge.

Efficient and financially sustainable provision of the water and sanitation services is also a common international objective. However, the starting position on cost recovery and perceptions of what "financially sustainable" means both vary between countries.

In New South Wales, the major urban water utilities not only cover operating costs but they also cover depreciation of assets, earn a return on assets (ROA), and pay dividends to the government. Thus in New South Wales, the question of financial sustainability revolves around whether, irrespective of ownership, the utilities are earning a commercial ROA given the risks involved. In contrast, according to IBNET, 37 percent of water utilities did not cover their basic operating and maintenance costs (Denilenko et al. 2014). Such utilities would require external funding to cover operating costs, and cannot contribute to the funding of new and replacement assets from their own resources.

8.2. Structure of Government in Australia

There are three levels of government in Australia. The commonwealth (national) government, which is responsible for the whole country and covers issues like immigration, trade, competition policy, communications, taxation, defense, and foreign affairs. State government, comprising Australia's six state and two territory parliaments, which are responsible for the delivery of services such as schools, hospitals, roads, railways, electricity, water, mining, and agriculture. Local government, made up of around 500[3] councils across Australia. Councils are responsible for local services and matters, such as local roads, parks, rubbish collection, library services, street signage, and pet control.

The state and local governments are responsible for delivering services to the community, while the commonwealth has a stronger role in policy formulation and coordination rather

than service delivery. Arguably, government has become more complex, especially with increasingly national and international markets, and the need for coordination and cooperation between governments has increased.

As a result, there has been a strengthening and expansion of mechanisms for a federal approach to decision making involving commonwealth, state, and sometimes local governments. COAG has played a key role in this. COAG is the peak intergovernmental forum in Australia, and its members are the prime minister, state and territory premiers and chief ministers, and the president of the Australian Local Government Association. COAG is supported by its own secretariat and underneath COAG are various parallel councils and committees of portfolio ministers, such as the Transport and Infrastructure Council and the Energy Council. In addition to COAG, new agencies have been established with governance arrangements that ensure accountability to both commonwealth and state governments. For example, while the Australian Competition and Consumer Commission (ACCC) is part of the commonwealth government for administrative purposes, its commissioners are jointly appointed by the state and commonwealth governments.

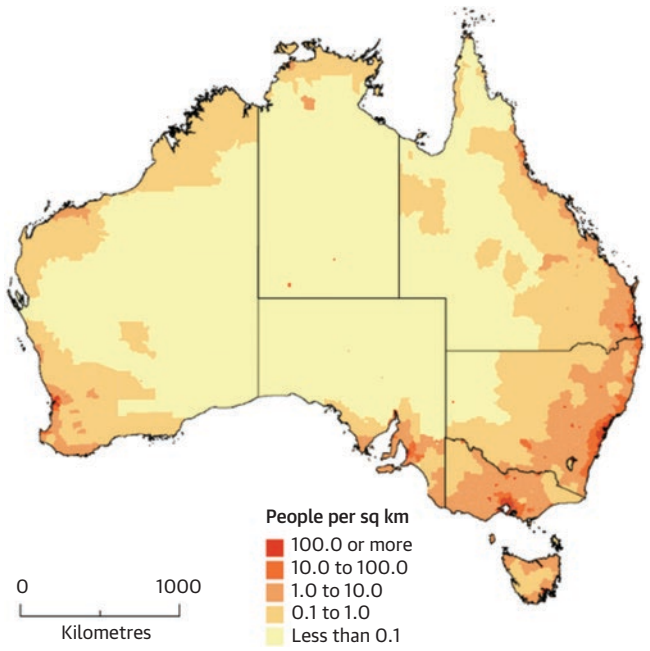
The "power of the purse" has been the other key means of strengthening coordination and advancing the reform agenda. There is a long history of fiscal transfers from the commonwealth to the states, in some cases for specific purposes with conditions attached. The fiscal transfers have grown over time, with an increasing imbalance between the revenue bases of the commonwealth and state governments and their respective service delivery functions and costs. These transfers have been used to expand the commonwealth government's role in both setting the policy frameworks within which state and local governments deliver services, and encouraging improvements in efficiency of service delivery. For example, in the mid- to late 1990s, the commonwealth government used competition payments to encourage compliance with the COAG Reform Framework. In the same way that payments are made from the commonwealth to states, states make payments to local governments (e.g., funding the Country Towns Water and Sewerage Scheme) and provide subsidized loans to local governments.

Since local government is not recognized under the constitution, the commonwealth government could not make payments directly to local government. Thus the competition payments were made to the states, and questions were raised about the extent to which these payments were ultimately transferred to local government.

8.3. Geographic Context for the Water Sector in New South Wales

Australia's population is mostly distributed along the coastal regions in the southwest (Western Australia), south (South Australia), and east and southeast (Victoria, New South Wales and Queensland); map 8.1. New South Wales is the most populous state in Australia, with most of its population in the Sydney region, Sydney being the most densely populated region in Australia. Newcastle, some 200 km north of Sydney, is the second most populous region in New South Wales.

MAP 8.1. Population Density of Australia, June 2010



Source: Australian Bureau of Statistics, Australia Yearbook 2012.

Traditionally, urban water and wastewater services have been supplied by vertically integrated, government-owned monopolies. The structural, institutional, governance, and regulatory arrangements of the sector vary across New South Wales. The provision of water can be broadly divided across three main regions: (a) major adjoining urban areas of Sydney-Central Coast-Newcastle; (b) other coastal basins, and (c) inland areas.

In the major metropolitan areas of Sydney and Newcastle, water and wastewater services are provided by two state-owned corporations: SWC and HWC. The coastal region between Sydney and Newcastle was supplied with water by two local government councils, but recent changes to the structure of councils in New South Wales means that this area is now served by one local council (Central Coast Council). Across the main metropolitan area from Wollongong (south of Sydney) to Newcastle, three different models exist:

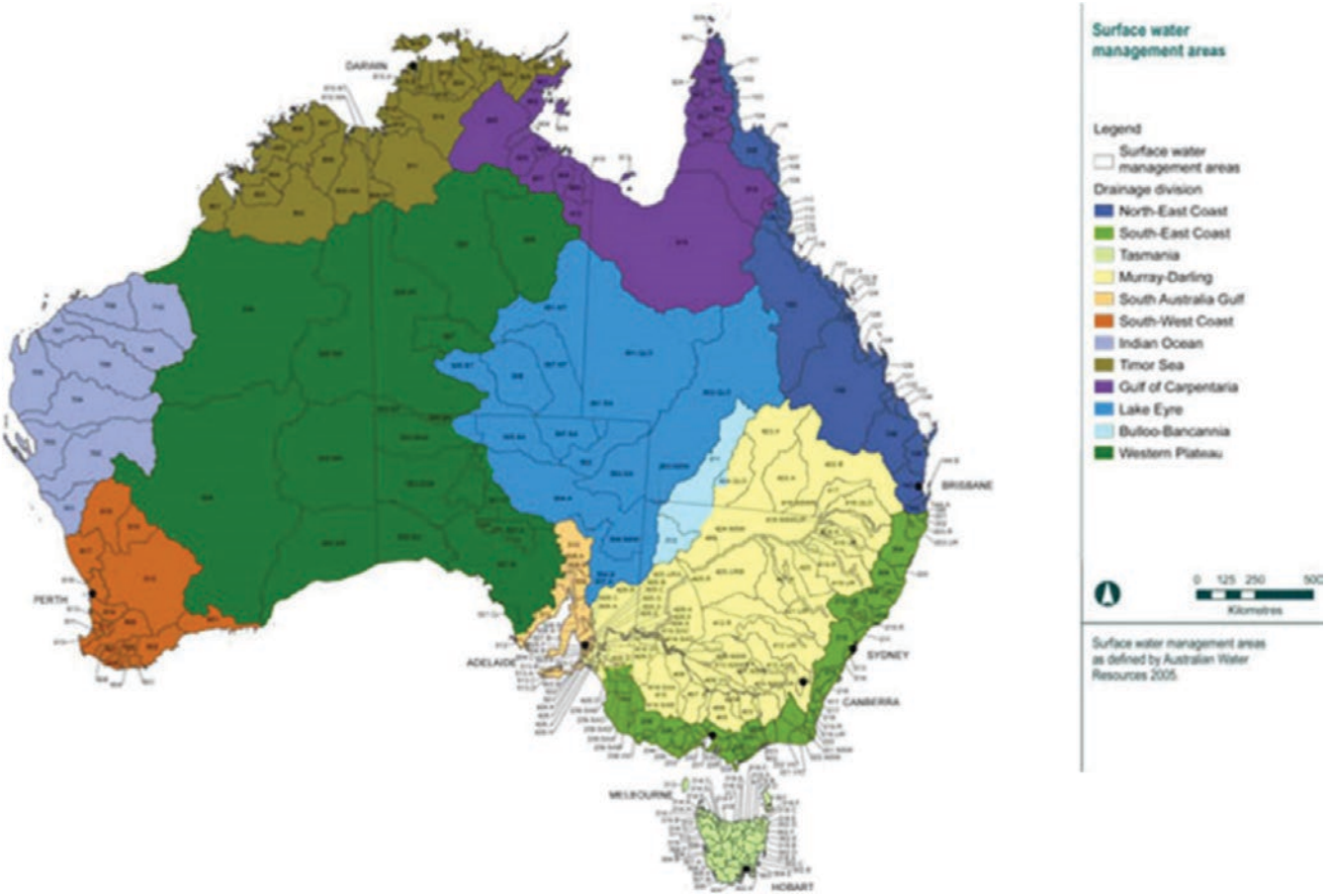
- In Sydney, bulk water has been separated from the distribution and supply of water to end customers. WaterNSW (previously the Sydney Catchment Authority) is responsible for bulk water supply (except the desalination plant), and delivery of bulk water to treatment plants. SWC is responsible for the water (and wastewater) treatment, and the transmission, distribution and retail functions of water and wastewater.
- HWC is a vertically integrated water business providing bulk water, distribution, and supply services to its customers in Newcastle and the Hunter Valley of New South Wales.
- On the Central Coast, the previous two local government councils had shared the bulk water role and separately undertook distribution and retail functions. With the merger of the councils, there is now a single council-owned water business that is vertically integrated.

In most other towns, water and wastewater services are provided by 105[4] local government-owned entities. Coastal areas have discrete basins (see map 8.2) and relatively higher rainfall. In these areas there is limited competition between urban and rural water use.

In the inland areas there are numerous country town water utilities in each basin. These areas are much drier than the coastal regions, and there are limited amounts of water available each year. Much of this inland area is within the Murray-Darling basin, where a major issue is the balance between water for environmental flows and water for agriculture.

Nonurban bulk water is provided by WaterNSW for regulated rivers,[5] and the Water Division of the Department of Primary Industries (DPI Water) for unregulated rivers and groundwater. Unless otherwise stated, this paper focuses on SWC and HWC, which serve 71 percent of the New South Wales population and 22.8 percent of the national population.

MAP 8.2. Water Basins of Australia



Source: Australian Bureau of Meteorology 1997.

8.3.1. Allocation of Responsibilities and Sector Structure

The key issues in this structure are the allocation of responsibilities and ownership. The various responsibilities in the water sector are (a) water resource planning; (b) bulk water storage and supply; (c) distribution and supply of water; (d) transfer, treatment, and discharge of wastewater; (e) management of stormwater; and (f) regulation of water quality, discharge standards, service standards and prices.

The vast majority of organizations are government-owned entities. These operate as a state government department, a commercial business (statutory authority), state-owned corporation (SOC) or a local government organization. The allocation of responsibilities within the Sydney-Central Coast-Hunter region is shown in table 8.1. The allocation of responsibilities in other New South Wales regions is shown in table 8.2.

The local water utilities outside the major urban areas ("country town water authorities") operate under a system of self-regulation and compliance reporting within mandatory

TABLE 8.1. Agencies Responsible for Regulating Water Utilities in Major Urban Areas, Sydney, Central Coast, and Hunter Valley

Function	Sydney	Central Coast	Hunter
Water resource planning[a]	Metro Water Directorate within DPI Water[b]	Central Coast Council[e]	Metro Water Directorate within DPI Water[b]
Bulk water supply	WaterNSW[c] and Sydney Desalination Plant[d]	Central Coast Council[e]	HWC[c]
Distribution and supply of water	SWC[c]	Central Coast Council[e]	HWC[c]
Wastewater services	SWC[c]	Central Coast Council[e]	HWC[c]
Stormwater services	SWC[c] and councils[e]	Central Coast Council[e]	HWC[c]
Water quality standards	Department of Health[b]	Department of Health[b]	Department of Health[b]
Environmental standards	EPA[b]	EPA[b]	EPA[b]
Customer standards	Minister,[c] advised by IPART	Minister,[c] advised by IPART	Minister,[c] advised by IPART
Price regulation	IPART	IPART	IPART

Note: All other agencies *not* marked with superscript letters are independent agencies. EPA = Environment Protection Authority; HWC = Hunter Water Corporation; IPART = Independent Pricing and Regulatory Tribunal; SWC = Sydney Water Corporation.

a. The other element of resource management relates to DPI Water as the resource regulator (i.e., the regulator and administrator of the water property rights [entitlements] system. DPI Water grants licenses (entitlements) to extract water from the natural environment and imposes conditions on water utilities regarding environmental flows. It administers cap and trade water entitlement systems, by water source or valley, and across the state.

b. Government department.

c. State-owned corporation.

d. Private.

e. Local government.

TABLE 8.2. Agencies Responsible for Regulating Water Utilities Outside Major Urban Areas, Murray-Darling Basin and Coastal Basins

Function	Murray-Darling Basin	Coastal Basins[a]
Water resource planning[b]	Murray-Darling Basin Authority/DPI Water[c]	DPI Water[c]
Bulk water supply	WaterNSW[d]	WaterNSW[d]
Distribution and supply of water in country towns	Local councils[e]	Local councils[e]
Wastewater services	Local councils[e]	Local councils[e]
Stormwater services	Local councils[e]	Local councils[e]
Water quality standards	Department of Health[c]	Department of Health[c]
Discharge and receiving environment standard	EPA[c]	EPA[c]
Customer standards	Local councils[e,f]	Local councils[e,f]
Price regulation	Bulk water: IPART is now regulating WaterNSW's prices in the MDB, under accreditation from the ACCC Retail: Local councils[e,f]	Bulk water: IPART Retail: Local councils[e,f]

Note: All other agencies *not* marked with superscript letters are independent agencies. ACCC = Australian Competition and Consumer Commission; EPA = Environment Protection Authority; IPART = Independent Pricing and Regulatory Tribunal; MDB.

a. Excludes Sydney, Hunter Valley, and the Central Coast Council.

b. DPI Water is also the natural resource manager, responsible for administering the water entitlement (property right) and Water Sharing Plan system, and can therefore be a significant regulator of water utilities.

c. Government department.

d. State-owned corporation.

e. Local government.

f. With support from guidelines prepared by DPI Water as part of the Best Practice Management Framework. Compliance with this is not mandatory, but financial assistance is contingent upon compliance.

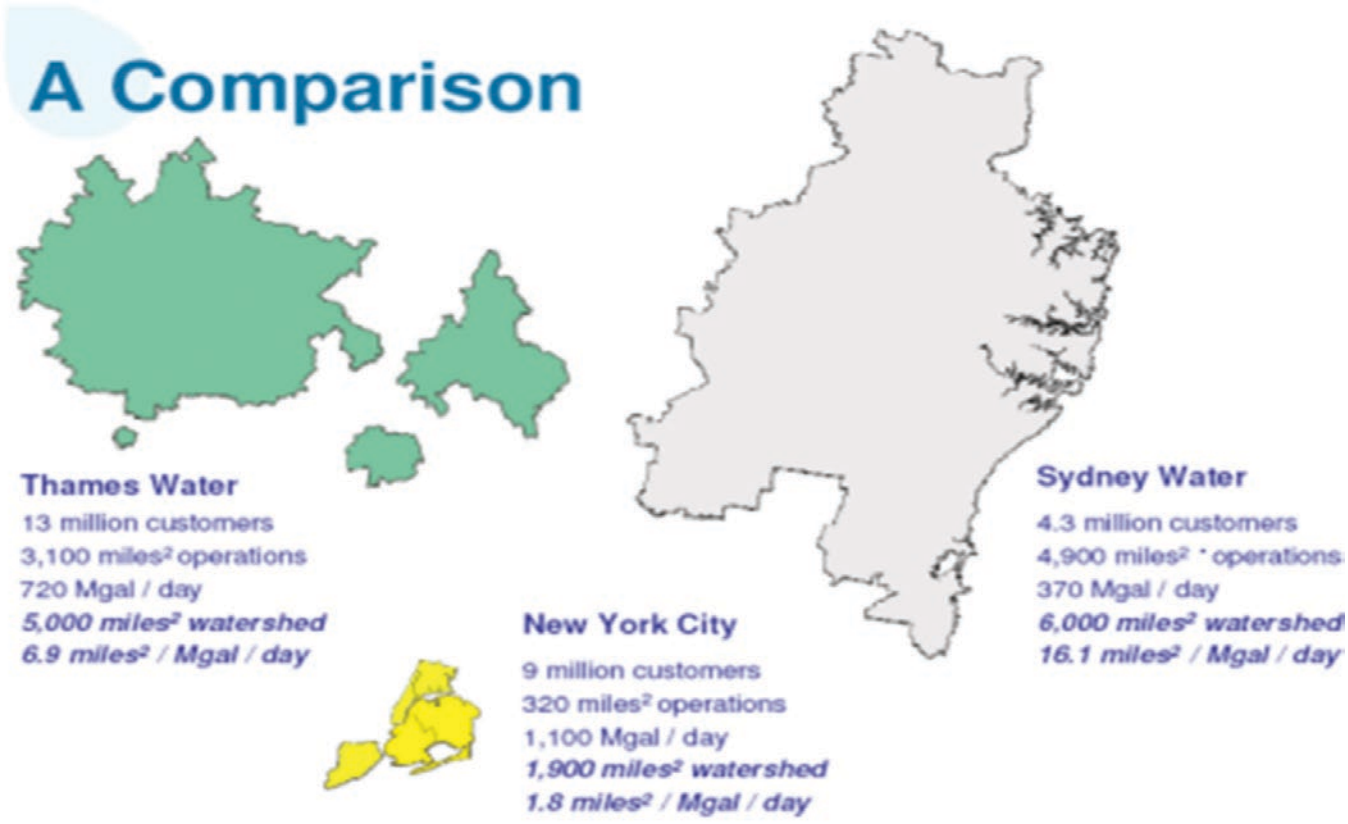
principles and frameworks overseen by the Department of Primary Industries (DPI). A 2009 review considered a number of options for the structure and regulation of these local water utilities. The option of bringing local water utilities under the regulation of IPART was considered but not supported. It would not be feasible to separately regulate each of the 105 utilities with the same approach used for the major metropolitan water agencies. The approach of centralized (statewide) principles with local responsibility and accountability would be more efficient and consistent with the existing system of accountability through local councils that are responsible for the delivery of the services. However, the requirements for compliance were strengthened, as were the principles and frameworks, in line with the national water framework.

8.4. Background

8.4.1. Sydney Water Corporation

SWC supplies water and wastewater services to Sydney, the Blue Mountains, and Illawarra. Historically, SWC had also managed the bulk water storages within its area of operation.

MAP 8.3. Comparison of Sydney Water Corporation to Thames Water and New York City Water



Source: SWC, 2015.

However, due to industry reform, SWC is no longer responsible for bulk water storage and supply. It now purchases water from the government-owned WaterNSW and the privatized Sydney Desalination Plant (SDP).[6]

SWC is an SOC and Australia's largest water utility. As map 8.3 illustrates, SWC is among the world's largest government-owned water utilities. It was corporatized in 1994 with commercial objectives. The government appoints SWC directors, who have the normal obligations of directors of private companies. SWC pays dividends of around $A 250 million per annum (approx. 10 percent of revenue) (SWC Annual Reports (various). The Portfolio minister has the power to provide SWC with directions in writing, and SWC could then seek funding from the government for the additional costs incurred, or revenue foregone, in following these directions.

SWC's assets are valued at $A 15.9 billion (SWC 2015).[7] SWC manages over 21,635 km of pipes for its water network and over 25,085 km of pipes in its wastewater network. It has 150 water and 675 wastewater pumping stations, and 242 water reservoirs (SWC 2015, 8). It has nine water treatment plants and 28 wastewater treatment and water recycling plants (SWC 2015, 8).

MAP 8.4. Hunter Water Corporation's Area of Operation

Source: HWC submission to IPART, 1 July 2016.

8.5. Hunter Water Corporation

HWC is also an SOC that provides drinking water, wastewater, recycled water, and some stormwater services to a population of 578,000 people across Newcastle and the Lower Hunter (see Map 8.4). HWC, corporatized in 1991, was one of the first state agencies to be corporatized in New South Wales.[8] HWC has 466 staff and manages an asset base of more than $A 2.7 billion worth of water, wastewater and recycled water infrastructure (HWC 2015, 8). HWC serves an area of 6,671 km^2 and delivers an average of 196 ML of water per day. HWC sources water from Grahamstown Dam

(182,305 ML), Chichester Dam (18,356 ML), Tomago Sandbeds (60,000 ML), and Anna Bay Sandbeds (16,024 ML) (HWC 2015, 8). HWC maintains an extensive system to transport wastewater (sewage), treating almost 65,000 ML of wastewater annually utilizing 4,903 km of sewer mains, 413 pumping stations and 19 wastewater treatment works. HWC also owns and operates a small stormwater network in Lake Macquarie, Newcastle, and Cessnock (HWC 2015, 8). HWC paid a dividend of $A 21.3 million in 2014-15 (HWC 2015, 21).

8.6. Comparison with Urban Water Structures in Other States

8.6.1. Melbourne

Melbourne has one bulk supplier (Melbourne Water, which is also responsible for the transmission network) and three retailer-distributors (City West Water, South East Water, and Yarra Valley Water, which each service a different area of Melbourne). The current Melbourne water industry structure was implemented in January 1995. As stated by the Department of the Treasury, the key structural reform separated wholesale from retail functions, with the creation of separate retail utilities that "compete by comparison, thus stimulating the sorts of efficiencies in service and cost management that are witnessed between competing private sector businesses" (Yarra Valley Water 2007, 4). Melbourne Water manages the wholesale function (comprising headworks and major sewage treatment works) (Yarra Valley Water 2007).

The separation of the wholesale and retail functions in Melbourne provides additional clarity on cost allocation, and the creation of three retailers allowed for influence through comparative competition. The Essential Services Commission (ESC) Performance Reporting Framework for the metropolitan water suppliers focuses on service performance measures rather than cost-efficiency measures. To date, the price determinations have not used formal cost-efficiency benchmarking, although Frontier Economics (consulting firm) proposed increased use of benchmarking as part of ESC's review of its price regulation approach.

8.6.2. Queensland

In 2007, the state government began major water reforms to "drought-proof" South East Queensland. The first stage of the water reform was completed in July 2008, when the state centralized South East Queensland bulk water assets through the establishment of four new state government-owned organizations that provided wholesale water to local government water retailers:

- **Seqwater** (bulk water dams and treatment plants) owns, operates and maintains all South East Queensland dams (including the Hinze Dam), bulk supply reservoirs, and water treatment plants
- **WaterSecure** (manufactured water) owns, operates, and maintains the Gold Coast Desalination Plant and Western Corridor Water Recycling Scheme

- **LinkWater** (bulk transport) owns, operates, and maintains the bulk water transport infrastructure (South East Queensland water grid pipelines and mains)
- **Water Grid Manager** is responsible for managing contracts and flow of water around the South East Queensland water grid. South East Queensland councils purchase bulk water from the water grid manager to supply to customers through council-owned distribution networks

Three local government-owned retailer-distributors, Allconnex Water, Queensland Urban Utilities, and Unity Water, serve different areas of South East Queensland. Allconnex Water was jointly owned by the city councils of Redland, Gold Coast, and Logan. In 2011, the Queensland government repealed sections of the legislation establishing the retailer-distributors, allowing local governments to return to the previous structure of local government directly providing services. As a result, the city councils of Gold Coast, Logan, and Redland resumed responsibility for water and sewerage services on July 1, 2012.

A revised Seqwater was formed on January 1, 2013 through a merger of the three state-owned nonretail water businesses, the SEQ Water Grid Manager, LinkWater, and the former Seqwater. It is now also responsible for the long-term planning of the region's future water needs, a function that was formerly undertaken by the Queensland Water Commission.

Currently there is one bulk water supplier (Seqwater), and five water retailers in South East Queensland. Retail suppliers responsible for water distribution and sewage collection, treatment, and disposal include the following:

- Queensland Urban Utilities, servicing the local government areas of Brisbane, Ipswich, Somerset, Scenic Rim, and Lockyer Valley
- Unitywater, servicing Moreton Bay and Sunshine Coast
- Gold Coast City Council
- Logan City Council
- Redland City Council

8.6.3. Factors behind Different Models

Prior to 1998, SWC was a vertically integrated water business. However, in 1999, the bulk water functions were separated out following a protracted boiled water alert that raised questions about catchment management and quality of water. Separating the bulk water function from the distribution and supply functions was seen as way of strengthening responsibilities and accountabilities. It was argued that this would provide a clearer focus on catchment management and water quality by establishing a single entity with its primary responsibility being the supply of bulk water. An important part of these reforms was increased requirements for testing, monitoring, and reporting on the quality of water supplies. However, the government did not extend this separation of bulk water from distribution and supply to HWC.

There were strong similarities between the structures of SWC and HWC at the time. Both were vertically integrated water and wastewater utilities that relied on one large dam as the primary source of bulk water. The key distinguishing features are that the same issues in regard to the quality of bulk water supplies had not arisen in the Hunter and that HWC was considerably smaller than SWC, with an asset base less than one-fifth of that of SWC. The smaller size of HWC raised questions about the economic viability and cost of a separate bulk water agency, although this function could be transferred to WaterNSW (as has now occurred in Sydney).

The Central Coast model is the result of local council ownership of the water and wastewater networks within their local government area. Historically, the two councils had their own water storages. However, as the communities grew there was limited capacity for new dams, and there were benefits in sharing dams and bulk storages. To supplement supply, a pipeline was built in 2006 from the Hunter Valley to the Central Coast. This pipeline supplied about 35 percent of the Central Coast's daily water use in 2006.[9] Initially built to provide the Central Coast with water during the drought, the pipeline has the capacity to transfer water back to the Hunter Valley when needed.

While bulk water supply was a shared function between the two councils, each council owned and operated its own water distribution and wastewater systems. The costs for these functions were allocated and tracked, but otherwise there was limited separation of the water and wastewater functions from the other activities of council. The next reform originally proposed for the Central Coast was the establishment of a separate, jointly owned utility providing water and wastewater services to both councils. The utility would be a corporatized entity and its prices would be regulated by IPART, as are the councils' current water and wastewater charges. With the recent amalgamation of the two councils, the establishment of a corporatized authority is unlikely and IPART continues to regulate the combined council's water and wastewater charges. The Victorian model reflects a number of possible factors, including benefits of benchmark and comparative competition; skepticism regarding economies of scale in distribution and retail, and longer term vision of privatization and competition

The Queensland reforms in 2008 were intended to drought-proof the state by placing the bulk water functions within central control; prior to this, the local councils were responsible for their own dams, bores, and other water sources. In principle, this can facilitate coordination of the various water sources to maximize the security of supply.

8.6.4. Assessment of Models

Each different model can be made to work in practice. The SWC model needs strong contracts and monitoring of water quality to maintain alignment of accountabilities and responsibilities. This has been achieved through the strengthening of the licensing arrangements. However, the different sizes and structures of the metropolitan water agencies regulated by IPART limit the value of cross-sectional peer benchmarking. Nevertheless,

in past reviews IPART has used comparison of trends in costs over time. For its review of the performance of the New South Wales SOCs (IPART 2010b), IPART estimated the trends in productivity of time and undertook comparative analysis of these trends for SWC and HWC, and individually compared the performance of each for various cost and service key performance indicators (KPIs) against their peers in other states.

While the New South Wales model does not prohibit benchmarking, one of the strengths of the Victorian model is that it facilitates comparison by competition. According to the National Water Commission (NWC):

> In 2007, the Victorian ESC noted that comparative competition had worked to improve performance and in particular to "encourage management teams to innovate to improve service delivery relative to other businesses". Anecdotal evidence (sourced from personal correspondence) suggests that the managers of the Melbourne water retailers pay significant attention to their relative performance. The performance data also appears to support this contention. In the years following the disaggregation, the performance of Melbourne retailers improved significantly on many measurable customer performance metrics, including customer complaints, water quality compliance and the speed with which unplanned interruptions and sewer spills were rectified. (LECG Limited Asia Pacific 2011, 26)

The public performance reporting under the ESC focuses on various dimensions of service outputs and quality, rather than measures of cost and efficiency. This limits its value in price setting and in its determinations of prices for the three Melbourne water suppliers since the ESC has not used formal comparative benchmarking. However, the ESC is undertaking a review of its approach to regulating water prices, and Frontier Economics has recommended that it increase its use of benchmarking.

In Queensland, the reversals made to previous reform decisions reflect the unrest within the industry about the initial reforms, which relied on minimal consultation with the local government and the community. Hence, it is difficult to draw conclusions about the effectiveness of the model because the model operated only for a short period and the subsequent changes may have reflected deficiencies in the reform process rather than in the model itself.

Notes

1. The issue of access to water in very remote, primarily indigenous communities is not covered in this report.
2. The COAG is a peak forum of the prime minister of Australia, the premiers of each of the states, and the chief ministers of the territories.
3. The Commonwealth Department of Infrastructure and Regional Development stated that as of August 2016, there were 547 local councils, but it was unclear if this allowed for the amalgamations underway in New South Wales. See its website, http://regional.gov.au/local.
4. See New South Wale's website http://www.water.nsw.gov.au/urban-water/local-water-utilities. The number is likely to reduce with under the current program of council amalgamations.

5. Regulated rivers are those rivers in which downstream flows are regulated by a major storage or dam.
6. Following a water alert incident in 1998, the government separated the bulk water functions from the water supply functions. The government established the Sydney Catchment Authority (SCA) to manage the water storages. On January 1, 2015, WaterNSW was formed by merging the SCA with State Water Corporation (WaterNSW Annual Report 2014-15).
7. SWC, Annual Report 2014-15.
8. The State Owned Corporations Act was passed in 1989.
9. Central Coast Council website, https://www.wyong.nsw.gov.au/my-property/water/water-supply system/hunter-connection.

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Chapter 9 Framework for Improving Performance

This chapter explains the framework that has been adopted in New South Wales and Australia for improving the performance of the sector. The framework separated policies on commercial operation from actual policy function and tried to improve the incentives for commercially sustainable and efficient delivery of services. It has evolved over time in response to specific circumstances, with individual "champions" playing an important role in implementing innovative reforms in advance of changing framework requirements and influencing others in the sector to also create change. Thus, it was not a straightforward reform pushed by central policy makers.

9.1. Framework Adopted

The framework for improving performance has revolved around (a) a clearer policy and operating framework for the sector; (b) clear commercial objectives for the service providers aligned to the framework; (c) sector restructuring, a stronger role for the private sector, and facilitation of competition; and (d) depoliticization and reform of pricing and its regulation. Conceptually, this is a coherent package that strengthens the incentives of service providers and aligns these to the objectives for the sector. However, it has evolved nonlinearly over a period of more than 30 years rather than as a straightforward, planned process.

9.2. Evolution of the Framework and Its Implementation

The sequence of reforms is summarized in Figure 9.1. A focus on national policy frameworks rather than the sequence of reform implementation may create a perception that both the Council of Australian Governments (COAG) Water Reform Framework and the National Competition Policy (NCP) (Hilmer Report) led the way. However, both followed earlier reforms in some states and utilities, such as Hunter Water Corporation (HWC) and Sydney Water Corporation (SWC). The history of this reform demonstrates the need for push from more than one party to drive change. Some champions will act in advance of national agreements, testing different approaches, demonstrating progress, and providing pathways for reform. In the case of water reform in Australia, HWC is widely recognized as the key innovator and champion of reform through the 1980-2000 period.

This is recognized in the submission of the Australian Water Association (AWA) to the review of the NWC in 2010, which stated:

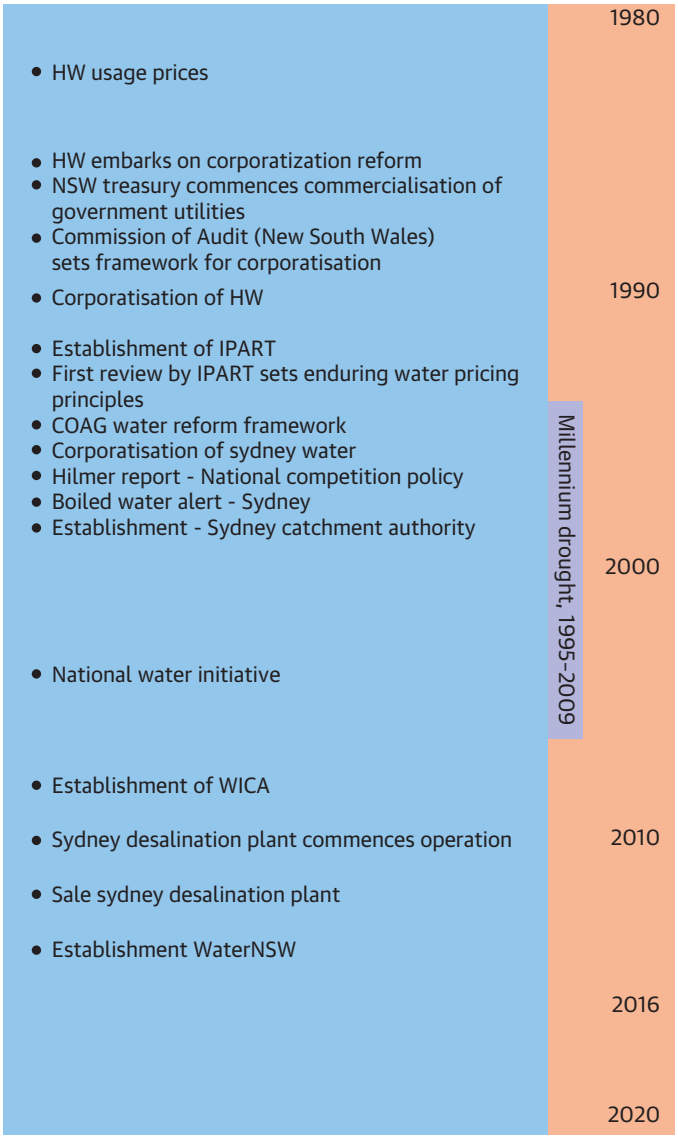
> The Australian water industry has a very successful history of reform. Through the mid-to-late 1990's, these were stimulated by the National Competition Policy (NCP), but are not merely a response to it. Indeed, reform paralleling the notion underpinning the NCP - that "competitive markets will generally best serve the interests of

consumers and the wider community" - was first introduced by Dr John Paterson, President of the then Hunter District Water Board in the early 1980s. (AWA 2010)

The AWA went on to argue that:

What had been a heavily subsidised industry, under the control of disparate local governments - either directly or through their participation on governing boards - has become a competitive, financially secure industry, under the management of skilled boards and which prices its services to recover its costs and achieve a return on investment. Furthermore, these reforms and others have led to a rationalization in water use, and a highly strategic approach to asset management that has reduced maintenance, improved asset life and reduced service interruptions. Environment protection and water quality has also improved significantly. (AWA 2010)

FIGURE 9.1. Water Reform in New South Wales in the Context of the National Reforms



Note: COAG = Council of Australian Governments; HW = Hunter Water; IPART = Independent Pricing and Regulatory Tribunal; WICA = Water Industry Competition Act.

One of the issues in examining the reform process is understanding the relationship between the state and national reform processes. The AWA argued that the NCP had a profound effect. For example, the access provisions under the commonwealth's Trade Practices Act (TPA), which were part of the NCP, was an important trigger of some reform in New South Wales. Services Sydney sought access under the TPA but this did not progress, and soon after the Water Industry Competition Act (WICA) was enacted, creating a state-based access regime.

The NCP did indeed have a profound effect but, as the preceding quotes infer, the relationship is more complex than one of national leadership pushing reform at the state and local government levels. Instead, some states and utilities led aspects of the reform process in advance of the national reforms. In many respects New South Wales was an early reformer, moving ahead of the national reform agenda. This in turn may have helped facilitate the national reform process.

In practice, the story of urban water reform in Australia is one of pull factors (early reformers leading the way) and push factors (nationally agreed policy frameworks, and monetary penalties and inducements), with the importance of each factor varying across states and over time.

Reform evolution reflects changing priorities and specific political-social factors, and for the major urban service providers can be usefully broken into the following periods:

- **Pre-1980s.** Water was viewed as a "social service" with poor financial performance, inefficient pricing with extensive subsidies, and a tax component
- **1980s**. Initial reform steps in the water sector led by HWC,[1] supported by the initial steps towards commercialization and corporatization
- **1990s**. Commercialization and price reform, which was part of a bipartisan national agenda on microeconomic reform to improve productivity
- **Late 1990s.** Improved financial performance and service standards framework
- **Mid-2000s.** Security of supply and competition

Reform of the 105 country town water supply authorities substantially lagged behind that of the major urban suppliers, in regards to price reform and commercial orientation. For example, although the COAG Water Reform Framework of 1994 required councils to introduce usage charges, it was well into the 2000s before most councils followed through (COAG 1994). The issue in this case was the time lag in implementation. In practice, the various principles developed under the national water agreements have been incorporated in the frameworks and principles for country town water authorities, and the requirements for compliance with these have been strengthened.

By contrast, reforms had already commenced in SWC and HWC prior to the national agreements, with substantial progress achieved, especially by HWC. Hence, in practice, the national agreements had less effect initiating the reform of the major urban suppliers in New South Wales. However, the National Agreements did the following:

- Promoted the extension of these principles to the reform of country town water supply schemes in New South Wales and other urban water suppliers that had not yet began reform processes
- Reinforced the commitment to, and continued implementation of, these reforms

The latter point is significant. As is argued below in regard to corporatization, these reforms require constant vigilance and effort, particularly the separation of political and commercial goals in regard to service delivery and pricing. Table 9.1 provides a summary of the reform process across the sector.

Objectives of governance and pricing reform were to (a) encourage more efficient and commercially sustainable delivery of services; (b) ensure the government (and the public) obtained an appropriate return on the assets invested, and to contribute to an improved fiscal position for the state; (c) depoliticize the management and operation of the water state-owned corporations (SOCs), and to separate commercial and non-commercial objectives and instruments; and (d) ensure more transparent pricing that is depoliticized, more cost-reflective, and provides a sound basis for the provision of the services the community needs.

TABLE 9.1. Reform of the Urban Water Sector, Australia

Period	Key events	Policy framework	Commercialization of service providers	Sector restructuring	Price and regulation
1980: Initial reform steps	Cadre of economic reformers at HWC under John Paterson changed focus from engineering to economics. Led the way in introducing usage charging. Concerns re: state's fiscal position. New South Wales Commission of Audit 1988: sets ground for next stage.	Review of sector framework and structure (John Paterson, head, Hunter Water Board). Review of urban planning. Commitment to corporatization following the Commission of Audit.	Initial steps to commercialization: dividend and return targets, current cost accounting for SOCs, (some) increase in independence for boards. Review of classification, accountabilities, and responsibilities of government agencies in mid-1980s.		HWC introduces price reforms: increases usage charges. Reorganizes around commercially focused business units.
1990s: Commercialization and price reform	Reform-focused governments at state and national levels crossing political lines of parties (Hawke–Keating then Howard–Costello at the commonwealth level, Greiner (New South Wales) and Kennett (Victoria). Hilmer Inquiry into National Competition Policy.	National Competition policy requires commercialization. Commonwealth establishes competition payments for states if they comply. Establishment of licenses covering: • Water quality • Compliance with environmental standards • Asset planning • Customer standards	Corporatization of HWC (1991) and SWC (1994). Protection against informal directions. Community service obligation policy provided funding for noncommercial objectives.		Establishment of IPART (1992) • First major price review (1993) reduces cross-subsidies, increases usage charges • Sets enduring principles for subsequent price reviews and reforms
From late 1990s: Improved financial performance and service standards	"Boil water" alert for Sydney. Increased Treasury pressure on dividends and returns.	Transfer of responsibility for license monitoring to IPART and strengthening license monitoring and reporting.		Catchment management and bulk water supply separated from SWC. SCA established as a separate SOC.	IPART responsible for advice on licenses and monitoring compliance. Risk-based approach to monitoring developed. IPART price decisions provide for increased WACC and profits.
Mid-2000s: Security of supply and competition	Millennial Drought sees storage levels fall rapidly. Government directs SWC to build desalination plant (SDP) to increase drought security. Services Sydney (private company wishing to supply water and wastewater services) seeks access to SWC infrastructure.	Water planning function enhanced under Metropolitan Water Directorate. WICA introduced to provide framework for competition in water and wastewater services.	IPART review of the water industry that recommended a negotiate and arbitrate access regime and associated licensing framework (i.e., WICA). IPART undertakes review of the corporatization framework and the performance of SOCs (incl. the water SOCs). SDP built and privatized under long-term lease.	New private entrants compete with SWC "at the margin: (e.g., recycling schemes in existing urban areas, provision of infrastructure and services in new developments on the fringe of Sydney).	Inclining block tariffs briefly introduced to promote conservation. Extensive discussion of dynamic scarcity pricing for water. Usage charges increased with increasing LRMC. New private entrants licensed under WICA.

Note: HWC = Hunter Water Corporation; IPART = Independent Pricing and Regulatory Tribunal; LMRC = long-run marginal costs; SCA = Sydney Catchment Authority; SDP = Sydney Desalination Plant; SOC = state-owned corporation; SWC = Sydney Water Corporation; WICA = Water Industry Competition Act.

The challenge has been to design institutions and structures to achieve this goal within the constraints of existing governance and political frameworks. For example, better progress was made on the fourth bullet point because of stronger institutional arrangements. Key points from the reform process:

- The design of regulatory frameworks and institutions is context specific. The establishment of Independent Pricing and Regulatory Tribunal (IPART) reflected the circumstances and political structures in New South Wales, especially the commitment of the then-government to long-term improvements in public policy.
- The subsequent binding commitment of all governments in Australia to a national competition reform agenda (National Competition Policy Review 1993), which includes independent regulation of network monopolies, has supported IPART's continuation and its independence.

IPART (then called the Government Pricing Tribunal or GPT)[2] was established in 1992 as an independent transparent body to regulate government-owned businesses. Regulating government utilities was not new in New South Wales or Australia. The government businesses had not previously been allowed to simply set their own prices unconstrained. Instead, the regulatory function had been performed by the cabinet, ministers, departments, or ad hoc review committees. However, independent regulation of government-owned utilities was unusual. U.S. regulators had largely overseen privately owned utilities, while prices for government-owned businesses were set by governments. In the United Kingdom, regulators were established to support privatization and regulate private businesses.

In delegating the control of prices to an independent regulator, such as IPART, the government recognized that there were problems in the pricing of utility services such as water, and that political control was a key cause as it was difficult for politicians to "depoliticize" pricing.

Notes

1. HWC was the first water supplier to introduce usage-based pricing in the mid-1980s, and the first water business to be corporatized in New South Wales.
2. It was renamed the Independent Pricing and Regulatory Tribunal in 1996 when its functions were expanded to include the regulation of gas prices, and broader public reviews of industry and other policy matters.

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Chapter 10 Current Policy and Operating Framework

Sydney Water Corporation (SWC) and Hunter Water Corporation (HWC) operate under a mature policy and licencing framework that reflects their economic, social, and environmental importance. The framework is consistent with, in principle, strong separation between commercial and social policy goals. While initiatives at the utility and state levels preceded the national reform agenda, the national changes have supported its ongoing development, entrenchment, and expansion beyond the major urban areas. Similarly, the framework for setting and monitoring compliance with health and environmental standards has become more robust. Continuing tension or concern remains around:

- Whether environmental standards are moving ahead of the community's willingness to pay for these higher standards,
- Whether environmental goals are being achieved through the most efficient means (e.g., whether higher standards on discharges by the major water utilities are being used when there are more cost effective options for reducing diffuse sources of pollution in receiving waterways).

This section discusses (a) national microeconomic reform and the water sector, (b) water resource planning, (c) drinking water standards, (d) wastewater and receiving environment standards, and (e) subsidy and access policy.

The next section discusses the state's corporatization and governance frameworks that govern the operation of SWC and HWC, consistent with the national microeconomic reform framework.

10.1. Overview of the Policy and Operating Framework

SWC and, to a lesser degree, HWC are substantial businesses in their own right, which provide important services for the economic and social development of the community. A key objective of the bipartisan microeconomic reform agenda of the 1990s was to lift the overall productivity of the nation by more efficient delivery and use of key infrastructure services. The NCP agreements and specific water policy initiatives, as well as the state's corporatization and governance policies, provided the economic framework within which SWC and HWC now operate. The key elements of the approach were to separate out commercial and policy goals and to promote competition where possible. Competition was seen to be the best means of promoting efficient delivery and use of services, but this has gone further in the energy sector than the water sector. Where competition was not possible, a framework was to be established to promote the efficient provision of monopoly services on a commercial basis with cost-reflective pricing.

Improving the efficiency and productivity of key infrastructure businesses, such as water utilities, was critical not only because it improved productivity of a large sector of the economy but also because of resulting benefits to other sectors that use infrastructure services. This focus on the commercial importance of the sector was not intended to overshadow the contribution of the sector to health and environmental outcomes, and the broader economic and social benefits of this. To this end, SWC and HWC must comply with their operating licenses, which are supervised by IPART. The operating license outlines requirements for compliance with drinking water and environmental standards, service quality standards, water resource management, and asset management and planning.

Quality of water supplies was overlooked until the "boiled water" warnings in Sydney of 1998, which arose due to the concern about the presence of cryptosporidium and giardia in the water. This issue led to a strengthening of the regulation and monitoring of water quality. It also resulted in the separation of catchment management and bulk water supply from water treatment, distribution and retail services, and thus the creation of the Sydney Catchment Authority (SCA) as a separate entity to SWC.

More recently, concern has focused on the security of water supply. This led to strengthened license conditions on water efficiency and target levels of consumption per head as well as investment in a large desalination plant.[1] These strengthened license conditions have been replaced in the latest version of the SWC operating license with the concept of an Economic Level of Water Conservation.[2]

Concerns about cost and efficacy of water efficiency and reuse programs, water resource planning, and the environmental discharge standards can create tension between the economic regulator and the water resource planners (the Metropolitan Water Directorate within DPI Water) and the Environment Protection Authority (EPA). The separation of these functions is helpful as it explicitly handles these tensions and trade-offs, rather than internalizing tensions within the decisions of a single regulator. If each regulator follows best practice regulatory or policy principles, there should not be any inherent tension between the respective roles.

SWC and HWC operate in sensitive environmental areas. They discharge wastewater and stormwater into environmentally sensitive waterways and beaches. At the commencement of regulation by Independent Pricing and Regulatory Tribunal (IPART) (then the Government Pricing Tribunal [GPT]), SWC had a proactive approach to environmental issues. For example, it used trade waste charges as a tax on-paid into an environmental trust to fund research, education and environmental repairs activities not limited to trade waste. However, IPART's first report raised concerns that the framework for setting environmental standards was not clear, with SWC leading environmentally driven investments that may have exceeded the community's willingness to pay. Subsequently, the role of the EPA has strengthened and SWC has resisted proposals for higher environmental standards where costs would exceed benefits or not be the most efficient means of protecting the environment. It would be naïve to link this directly to the commercialization of SWC. While IPART continues to pass through

the efficient costs of meeting mandatory standards, these standards do not threaten the long-term financial viability of the utility.

IPART's initial response to concerns about the costs of rising water quality and environmental standards was to establish a transparent "cost of quality" review in 1993, which established the costs of meeting various scenarios for water quality and environmental standards (GPT 1993b). While not determinative, it sought to influence policy choice through the transparent disclosure of costs and bill impacts. More recently, IPART has explicitly raised the prospect of not passing through the full efficient costs of legally enforceable standards if it considers those standards are not reasonable (IPART 2015).

During IPART's consultation on the 2016 SWC price review, livability (the quality of life enjoyed by a city's populace) became a major theme (IPART 2016b). This draws together environmental, water security, and customer affordability concerns.

In relation to environmental standards, IPART's current approach is based on the premise that the EPA sets environmental standards consistent with the government's requirements, and imposes those standards on SWC through its regulatory instruments. IPART then sets prices at a level that allows the utility to recover the prudent and efficient cost of meeting those environmental standards (IPART 2016b). Should stakeholders wish to improve liveability, achieving higher standards than those mandated by government, IPART considers what specific outcomes stakeholders want to achieve, and who is responsible for regulating that outcome. In this case, IPART would require clear evidence that it would be prudent and efficient for customers to pay to exceed the mandated standards, and whether SWC's customers have both the capacity and willingness to pay for the higher standard. IPART would also examine whether the government had already considered the higher standards when it set the existing standard (IPART 2016b).

10.2. Microeconomic Reform and the Water Sector

The COAG Water Reform Framework and the NCP have been the key national policies stimulating reform of the water sector.

10.2.1. National Competition Policy

The National Competition Policy (NCP) was the package of reforms set in 1995, based on the recommendations of a committee of inquiry chaired by Professor Fred Hilmer (National Competition Policy Review 1993). The NCP reforms built upon earlier microeconomic reforms, such as the COAG Water Reform Framework, to establish a national framework for microeconomic reform to improve productivity. The key elements of the NCP were the following:

- Commercialization and, where appropriate, regulation of government-owned utilities and other government-owned businesses
- Creation of a level playing field for government-owned and privately owned business (e.g., equal treatment for tax and competition policy)

- Establishment of independent price regulations and price reform
- Promotion of competition where possible, facilitated by access to essential monopoly facilities (e.g., pipes and wires) where necessary
- Competition payments to the state governments conditional on compliance with the requirements of the NCP

Competition Payments and the NCC

The NCP provided for the creation of the Australian Competition and Consumer Commission (ACCC) and the National Competition Council (NCC).

- Regulatory responsibilities were split between the ACCC, the national regulator, and state and territory regulators, such as the already established IPART and ESC (Victoria).[3] The ACCC was the regulator under national access regimes that governed regulated access to essential infrastructure and regulation of the national facilities, such as telecoms and airports that were within the commonwealth's jurisdiction. Water and electricity (and other services traditionally within the governance of the states) were regulated by state-based regulators, but regulation of terms and conditions for access to essential infrastructure (e.g., pipes and wires) for competitive supply of electricity had to be consistent with the national access regime, and regulation of final prices was to be consistent with the principles set out in the NCP.

Over time, the role of the ACCC and the Australian Energy Regulator (AER)[4] has expanded. Regulation of the National Electricity Markets that covers all states except Western Australia[5] and the Northern Territory has largely moved to the AER, and the ACCC has taken on an increased role in regulating water where there is a national or cross-jurisdictional market (i.e., the Murray-Darling Basin), and retail prices outside urban areas.

An important feature of the institutional framework has been the financial incentives (competition payments) made by the Australian government to the states and territories to compensate for the fiscal dividend from their implementation of the agreed reform commitments (see Box 10.1). The role of the NCC was to advise on the declaration of facilities under the national access regime, review compliance of the state and territory governments with the NCP requirements, and advise on competition payments to be made or withheld based on the compliance assessment.

The NCC commented in its submission to the Productivity Commission (PC 2005) that competition payments and penalties for noncompliance, have been an important contributor to the success of the NCP:

> Using competition payments to leverage reform outcomes in areas of state and Territory responsibility has been effective in increasing the consistency and commitment to implementing national reforms. ... Reform would have been slower and less comprehensive without competition payments. (NCC 2004, 35)

BOX 10.1. How Competition Payments Work

The Australian government provided competition payments to the states and territories to reward them for satisfactory progress in implementing their reform commitments. The payments were a recognition by COAG that all governments should share in the benefits of economic growth and the associated higher taxation revenue resulting from the reform program and that, with the high degree of vertical fiscal imbalance, much of the increase in tax revenue would initially accrue to the Commonwealth.

The Australian government allocated funds totalling about $A 5.7 billion for competition payments over the period 1997–98 to 2005–06. The NCC assessed each state's progress of reform and made recommendations to the Australian Treasurer on any penalties that would need to be applied. In assessing the nature and size of any penalties that it recommends, the NCC took into account the significance of the compliance breach, the extent of the state or territory government's overall commitment to NCP implementation and the effect of that jurisdiction's reform efforts on other jurisdictions. Penalties fell into three categories:

- Permanent deductions, for specific compliance failures
- Specific suspensions, which applied until predetermined conditions were met
- Pool suspensions (which could be recouped), which applied to groups of compliance failures in nonpriority areas of the legislation review program, but did not warrant an individual penalty.

Overall, the sector reforms and operating and regulatory structures would have been less consistent across the states and territories. This is particularly important for sectors that span states, such as the electricity market and Murray-Darling Basin.

A component of New South Wales competition payments in 2003-04 and 2004-05 were withheld in response to the NCC's assessment that there were shortcomings in the water resource sharing plans[6] (see box 10.2). In 2005, the NCC assessed that New South Wales had met the resource planning requirements under the National Water Initiative (NWI) and withheld payments were released. Although causality cannot be shown, this demonstrates the competition payments and compliance assessment scheme apparently working as intended.

10.2.2. Water-Specific National Reform Agenda

The NCP was not specific to the water sector. Rather, it set a general framework for improving the contribution of infrastructure to the growth and competitiveness of the national economy. However, its focus on competition and commercialization was more immediately relevant to the major urban water suppliers. While SWC and HWC had already commenced reform prior to this, the COAG Framework and the NCP reinforced and

BOX 10.2. National Competition Council Assessment of Water Sharing Plans

Over several assessments, the NCC sought evidence that New South Wales' environmental allocation arrangements for water in rural and inland basins were based on the best available science and that robust socioeconomic evidence supported departures from the science-based levels. Under the COAG water reforms, governments were to allocate appropriate water to the environment in the stressed and overallocated rivers. Governments were to substantially complete allocations in all rivers and groundwater systems by 2005.

New South Wales had gazetted 36 water sharing plans that allocated water for environmental purposes in the state's major rivers and groundwater systems. The NCC wanted evidence from New South Wales showing it had set extraction limits and environmental allocations using the best available science, and that departures to recognize the existing rights of other water users were supported by robust socioeconomic analysis. The NCC judged that New South Wales had not provided the robust information required to show its water sharing plans allocate appropriate water to the environment.

The NCC regarded the obligation to make appropriate allocations to the environment as a significant aspect of the COAG water reform program. Recognizing that New South Wales had deferred some of its plans and that substantial completion of allocations was due in 2005, the NCC recommended that 10 percent of the state's 2004–05 competition payments be suspended. The suspension was recoverable if New South Wales provided (a) robust information to support its current arrangements, or (b) environmental allocations within a range of outcomes that could reasonably be reached on consideration of the best available science and robust socioeconomic evidence.

In response to the NCC's recommendations in its 2003 NCP assessment, the Australian government applied a range of penalties to governments' 2003–04 competition payments. The penalties included permanent (irrevocable) deductions and suspensions of payments. In response to the NCC's recommendations in its 2004 NCP assessment, the Australian government released most of the suspended 2003–04 payments, in addition to applying a range of new penalties to governments' 2004–05 competition payments. In the case of New South Wales, the government suspended payment of $A 26 million for noncompliance in water.

box continues next page

BOX 10.2. continued

For the 2005 NCP assessment, New South Wales provided a report and additional information, to demonstrate it had addressed its COAG commitments. The NWC assessed New South Wales in reference to both: the 2004–05 suspended payments based on the evidence it had provided to meet the requirements for recouping these payments; and New South Wales's ongoing water planning activity and consistency with COAG commitments as set out in the 2005 NCP Assessment Framework.

New South Wales was assessed as meeting the majority of its obligations and therefore received its full entitlement for 2005–06. Also the suspended payments ($A 26 million) were reimbursed to New South Wales in the 2005–06 competition payments (total payment of $A 292.5 million).

strengthened these initiatives. There have also been a number of national policies and frameworks that have guided the development of the policy framework for the sector:

- COAG Strategic Framework for Water Reform, 1994
- National Water Initiative, 2004,
- Australian Drinking Water Guidelines, 2011
- National Water Quality Management Strategy, 1994
- National Performance Reporting, 2014
- National Sewage Quality Management Framework, 2012
- National Urban Water Planning Principles, 2008
- Enhanced National Urban Water Reform Framework, 2008
- National Water Initiative Pricing Principles, 2010

10.2.3. Council of Australian Governments Water Reform Framework 1994

The COAG Water Reform Framework was a strategic framework for the efficient and sustainable reform of the Australian water industry. The report was commissioned by COAG at its June 1993 meeting. Compared to the broader NCP Framework, it was more immediately relevant to the supply of water services outside major urban centers. The report noted that, while progress is being made on a number of fronts to reform the water industry and to minimize unsustainable natural resource use, there were these concerns:

- Approaches to charging that often resulted in commercial and industrial users of water services paying more than the costs of service provision
- Major asset refurbishment needs in rural areas for which, in general, adequate financial provision had not been made

- Impediments to irrigation water being transferred from low-value broad-acre agriculture to higher value uses in horticulture, crop production, and dairying
- Service delivery inefficiencies
- A lack of clear definition concerning the role and responsibilities of a number of institutions involved in the industry

The purpose of the water sector reforms was to achieve efficient and customer-oriented service through restructuring and reorienting public water utilities. In the New South Wales urban water sector, many of these reforms were already independently underway. Not only had the New South Wales businesses initiated reforms, but the GPT's (now IPART) report on Water and *Related Services* (1993) had addressed many of these issues and laid down a set of pricing principles and reforms consistent with the COAG Water Reform Framework (GPT 1993b).[7] As such, New South Wales was a leader in the reform process rather than a follower.

The framework embraced pricing reform based on the principles of consumption-based pricing and full-cost recovery, the reduction or elimination of cross-subsidies, and making subsidies transparent. The framework also involved the clarification of property rights, the allocation of water to the environment, the adoption of trading arrangements in water, institutional reform, and public consultation and participation.

10.2.4. National Water Initiative Pricing Principles 2004

COAG agreed to the NWI as the national blueprint for water reform. The NWI represented a shared commitment by governments to increase the efficiency of Australia's water use, leading to greater certainty for investment and productivity, for rural and urban communities, and for the environment.

The NWI sought to revitalize the reforms previously proposed in the NCP in the urban water sector. It also signaled a greater commonwealth government role in water policy. While much of the focus of the NWI was on rural water issues, for urban water the NWI largely focused on completing already agreed reforms. Under the NWI, governments made commitments to best practice water pricing including to do the following:

- Promote economically efficient and sustainable use of water resources, water infrastructure assets, and government resources devoted to the management of water
- Ensure sufficient revenue streams to allow efficient delivery of the required services
- Facilitate the efficient functioning of water markets, including interjurisdictional water markets, in both rural and urban settings
- Enact the principle of "user pays," and achieve pricing transparency regarding water storage and delivery in irrigation systems as well as cost recovery for water planning and management
- Avoid perverse or unintended pricing outcomes

The NWI pricing principles were developed jointly by the Australian government and state and territory governments to provide a set of guidelines for rural and urban pricing practices, and to help jurisdictions implement the NWI water pricing commitments in a consistent way.

By the time that the NWI was established, New South Wales and Victoria[8] had been well into their reform processes. Both had economic regulators for pricing and had well-established "user pays" pricing structures. The water businesses were operating more efficiently, recovering costs, and achieving a return on assets (ROA). The NWI pricing principles are comprised of four sets of principles, including the following:

- Principles for the recovery of capital expenditure, to provide guidance to water service providers on asset valuation and cost recovery for urban and rural capital expenditure
- Principles for urban water tariffs, to provide guidance for price setting in situations where there are monopoly providers and the absence of competitive pressures
- Principles for water planning and management, to provide guidance for urban and rural water service providers in identifying and allocating the costs of water planning and management activities between government and water users
- Principles for recycled water and stormwater reuse, to provide broad policy guidance to stimulate efficient water use in urban and rural settings no matter what the water source

The NWI pricing principles draw on the provisions in the 1994 COAG Water Reform Framework, the 1999 Tripartite agreement, and the NWI as well as the report of the Expert Group on Asset Valuation Methods and Cost Recovery Definitions for the Australian Water Industry (the Expert Group). The principles do not prohibit government intervention in price setting, but require that it be transparent.

An important feature of the asset valuation recommendations and associated pricing principles was the distinction between legacy assets (i.e., pre-existing assets) and new assets. While full cost recovery of new assets was considered standard, it was accepted that for various reasons—including use of grant funding, contributions, and inefficient investment decisions—existing assets could be written down or valued at less than depreciated optimized replacement costs. One way of doing this is to value the assets on the basis of deprival value, calculated by the net present value of the assets at current earnings. In practice this has been an important means of managing price impacts of the reform process, without damaging forward-looking principles of economic efficiency and the financial sustainability of new investments. One point the guidelines were very clear on was that to avoid double counting either (a) assets funded by customer contributions (or provided free of charge) should not be included in the asset base for the determination of prices, or (b) the customer contributions (in money or kind) should be offset against the allowed regulated revenue.

The principles for price structures were simple, direct, and based on economic principles. There should be a two-part price, with a fixed charge and a usage charge. The usage charge

should be based on the estimate of long-run marginal costs (LRMC), although the methodology for determining LRMC was not specified. The fixed charge should be set to recover the difference between the total revenue requirement and the revenue collected from usage charges. Locational differences in costs can be signaled in annual charges or up-front capital contributions at the time of connection.

A review of the NWI pricing principles was undertaken in 2010 to ensure consistency between the pricing principles and the Commonwealth Water Act 2007, as well as take into account any further changes required as a result of COAG water reforms. The Natural Resource Management Ministerial Council endorsed the NWI pricing principles on April 23, 2010.

10.3. Water Resource Planning

As private participation in the water sector increases, it is important to separate the role of water resource planning from the service delivery function. DPI Water is the water resource manager in relation to water sharing plans as the water entitlement (property rights) system across New South Wales.

The New South Wales Metropolitan Water Directorate within DPI Water leads a whole-of-government approach to water planning for greater Sydney and the lower Hunter, and provides policy advice on water industry competition and reform.[9] Underpinning this approach, the Directorate has developed water plans for Sydney and the lower Hunter.[10]

The Sydney Metropolitan Water Plan was first developed in 2004 in response to indications the drought was taking hold. The Metropolitan Water Plan intended to balance the water use and supply in Sydney over a 25-year period. The Plan was updated in 2006 due to deepening drought, and again in 2010 as part of the review cycle. The Plan recognized that Sydney faces four significant factors in planning for future water management: population growth, drought, climate change, and river health. The Plan is reviewed periodically.[11] These reviews enable the government to adapt to challenges such as a highly variable climate, droughts, climate change, and a growing population, and to update the plan incorporating the latest data, techniques, and research. The mix of supply and demand measures is adjusted through these reviews to ensure that growth and drought needs are met while minimizing costs to the community. The current plan (2010 Metropolitan Water Plan) concentrates on four major areas: dams, recycling, desalination, and water efficiency. Key initiatives from the Plan include:

- **27 Recycling.** 70 billion liters of water to be saved through reuse projects by 2015
- **Desalination.** The Sydney plant commenced supplying water on January 28, 2010
  - Current capacity to supply up to 15 percent of Sydney's current needs (90 billion liters a year)
  - New operating rules have been established for 2012; the plant will operate at full capacity and supply desalinated water when the total dam storage level is below 70 percent and will continue to do so until the total dam storage level reaches 80 percent

- **Water efficiency.** Reducing demand for water by households and business (145 billion liters a year by 2015)
- **Water restriction.** Simplified water restriction regime for periods of drought

A major goal of the review of the Metropolitan Water Plan was to analyze the cost-effectiveness of various portfolios of water supply and demand options. Several portfolios of options (under different rainfall and inflow scenarios) were presented to the community and stakeholders. The findings of the consultation were considered in combination with the cost-effectiveness analysis, which compared the portfolios based on the cost of providing water security. The Metropolitan Water Directorate is currently reviewing the 2010 Metropolitan Water Plan.[12] Key issues for the current review include the following:

- The impact of changes to the information and policies underpinning the 2010 portfolio, regarding water supply and demand measures
- Identifying the optimal portfolio of water supply and demand management measures to secure water in drought and for growth over the next 50 years
- Impacts of flood management options at Warragamba Dam on water security
- Potential impacts of climate change on long-term water supply
- Identifying the community's values and preferences for securing a sustainable water supply system for people and the environment
- An assessment of the benefits and costs of a potential variable environmental flow regime from Warragamba Dam, to help protect and improve the condition of the Hawkesbury-Nepean River

Historically, HWC has undertaken the water resource planning in the lower Hunter. However, the Metropolitan Water Directorate has taken over that function and developed the Lower Hunter Water Plan in close consultation with HWC, government agencies, stakeholders, and the community. The plan was released in 2014. The Lower Hunter Water Plan sets out a strategy to ensure sufficient water to supply the people and businesses of the region. The plan proposes to use water efficiency, demand management options, recycled water, rainwater and stormwater, and temporary desalination to address water security during severe drought conditions.

An annual monitoring and evaluation process supports reviews of the Lower Hunter Water Plan. This ensures it can adapt to changing circumstances and meet the ongoing needs of the lower Hunter community, providing water security during drought and reliable water supplies for business and population growth.

Through these water plans, the New South Wales government has developed a comprehensive policy for managing urban water in Sydney and the lower Hunter. It is using an adaptive planning approach, with a major review including stakeholder consultation undertaken by an expert panel every four years. IPART, as the economic regulator, will need to consider the implications of this Plan in upcoming price reviews for SWC, WaterNSW (for the Sydney catchments) and HWC.

10.4. Drinking Water Standards

The SCA (now part of WaterNSW, the major statewide owner and manager of bulk water storage and supply) was established in 1999 following a series of boiled water alerts in Sydney during 1998. The SCA was responsible for the bulk water function. At the time, there was debate as to whether this would confuse accountabilities, but the separation is now accepted. Drinking water standards currently provide a catchment-to-tap approach to providing safe drinking water. The standards in New South Wales are set and monitored by the Department of Health. SWC and HWC manage water quality through their regulatory frameworks, drinking water quality results, Drinking Water Quality Monitoring Program, and incident and enquiry process.

The operating licenses establish the monitoring, reporting, and incident management requirements for the utilities. Under their operating licenses, SWC and HWC are required to comply with the *Australian Drinking Water Guidelines 2011* (published by the National Health and Medical Research Council and the Natural Resource Management Ministerial Council). These guidelines ensure drinking water quality by specifying health-based and aesthetic criteria for assessment, as well as a multiple barrier approach for preventative measures from catchment to tap to ensure safety of the water.[13]

Both SWC and HWC work closely with New South Wales Health through a Memorandum of Understanding (MOU) to ensure that all current and emerging issues associated with drinking water quality are identified and assessed.[14] The MOU defines the cooperative and regulatory relationships and the performance obligations of each party. SWC's and HWC's compliance with these drinking water standards is reported through their annual report of compliance with the operating license.[15]

10.5. Wastewater Discharge Standards

Wastewater and receiving environment standards are set and monitored by the EPA. It issues SWC and HWC with a license for each of its sewage treatment plants. The objectives of this license are to require the following:

- Practical measures to be taken to protect the environment and public health from sewage treatment plant effluent and sewer overflows
- Proper and efficient management of the sewage treatment system to minimize harm to the environment and public health
- No deterioration and continuing improvement in the sewage treatment system's environmental performance relative to existing conditions, and minimize the frequency and volume of overflows and sewage treatment plant bypasses[16]

Compliance with these requirements is reported through the licensing requirements. Key issues with the wastewater discharge standards are the cost of carrying out the standards, the community's willingness to pay, and how these two factors align. Increased standards

may have a significant impact on a utility's costs. In setting prices, IPART has allowed the utilities to earn sufficient revenue to enable recovery of efficient costs of complying with the requirements of environmental regulators. This approach recognizes the role and expertise of environmental regulators, as well as the suite of regulatory instruments and approaches potentially available to these regulators and the government in general.

In 1993, when IPART was concerned about the impact of rising water quality and environmental standards on the costs of services, it established a Cost of Quality Review (GPT 1993b). This inquiry did not have determinative powers, but IPART sought to bring together various stakeholders to focus on alternative scenarios for water quality and discharge standards and their implications. One objective was to better determine the costs of meeting various quality levels, since at the time, SWC felt that the cost of meeting higher standards was significantly greater than EPA had estimated. The second objective was to make public, and promote discussion about, the cost of higher standards. The review estimated that the anticipated standards could result in prices increasing by 25 percent to 30 percent, and recommended clarifications of the institutional arrangements to set standards based on sound cost-benefit studies and assessments of willingness to pay (GPT 1993a). The review's practical impact is difficult to assess, but arguably the risk of excessive standards was reduced.

In its review of SWC prices from 2003, IPART did not allow $A 16 million for an upgrade at the North Head Sewage Treatment Plant, since this was not in line with priorities set by the EPA of New South Wales. IPART's consultants expressed concerns that this project did not meet the EPA's environmental priorities, and recommended that funds not be allowed for this project. The review also indicated that SWC did not provide evidence that customers were willing to pay for the additional environmental improvements associated with this project.

IPART considered that SWC had not provided sufficient justification for the expenditure. IPART acknowledged that the upgrade could facilitate renewal and maintenance of existing standards, but that these upgrade benefits were not separately identified in the project, making it difficult for IPART to decide what customers should be expected to pay. In addition, there appeared to be little evidence that customers viewed these upgrades as a priority, compared with alternative environmental improvement projects under consideration by SWC.

In its recent issues paper for the review of SWC prices, IPART stated that it would not guarantee the pass-through of the costs of environmental standards if it didn't think that they were reasonable (IPART 2015a). This may strengthen SWC's resolve to argue against standards that may impose excessive costs or are not the most cost-effective means of achieving the desired outcome. This potential financial risk may also stir the interest of Treasury as the manager of the government's ownership interest. However, it will create a significant challenge for IPART if the EPA does raise standards to levels that IPART does not consider appropriate. If IPART does not pass through the costs of legally enforceable standards set by the responsible regulator, it may raise questions as to whether IPART is exceeding its powers and

seeking to become the de facto environmental regulator, and whether IPART is having due regard to the reasonable commercial interest of the service providers.

10.6. Subsidy Policy

The delivery of social programs through government businesses is often seen to be a poor outcome in policy and commercial terms, since delivery may be impaired by the lack of transparency and direct policy supervision. There is no "budget holder" responsible for ensuring that the delivery is cost-effective. The focus of a commercialized government business should be on its commercial performance while complying with transparent service obligations and standards. Non-costed, non-transparent policy obligations become a convenient excuse for poor performance. In addition, the misalignment of commercial and policy objectives means there is no assurance that programs would continue to be relevant to the needs of beneficiaries and to the government's social priorities. Finally, the approach is inefficient because the social programs are funded through cross-subsidies, which distort the business's production and investment decisions and consumers' consumption decision.

Important progress began when the New South Wales government established the Community Service Obligations (CSO) policy in 1994 and required that any non-commercial directions to corporatized government businesses must be in writing. Together, these moves ensure that any policy direction is transparent and explicitly funded, and that the cost of meeting policy directions falls on the government's budget rather than the water service provider. Box 10.3 summarizes the CSO policy framework.

Under the CSO policy, the New South Wales government should fund the utilities for the cost of noncommercial obligations imposed by the government, such as rebates for customers on pensions and welfare payments.

Importantly, the existence of the CSO policy and the classification of rebates for disadvantaged customers as a CSO has meant that IPART's role has not extended to "social pricing." The New South Wales government, not the regulator, has the role of determining policy relating to social programs and any assistance for disadvantaged customers. This is a sound principle, but it contrasts with common regulatory practice.

10.7. Access and Postage Stamp Pricing

Two key, related issues regarding urban water supply on which the state government has a clear and strong policy position are that there should be postage stamp pricing, and there should not be any developer charges. Postage stamp pricing means that for all customers in the service territory of the utility should pay the same charges. This has been a policy for many years under successive governments and was a transparent requirement by the government for inquiries into access to SWC's networks.

The policy requires that all residential customers served by SWC pay the same service and usage charges, even though the costs of servicing may vary. This is particularly the case for wastewater services, in which the costs of treatment depend on the size of the area served

BOX 10.3. Summary of Community Service Obligations Policy

What are CSOs? CSOs (or social programs) are noncommercial activities with social objectives delivered by SOCs. From the government's perspective, the focus should be on achieving desired social objectives, regardless of whether the SOC is the preferred delivery vehicle or not.

Why is a CSO policy important? The CSO policy is a critical component of the strategy of commercialization and corporatization. It separates the roles of "purchaser" and "producer" of services to the public; ensures competitive neutrality and use of the most efficient policy delivery modes; and preserves and reinforces the commercial objectives of the SOC.

What is the process for identifying and approving CSOs? CSOs are identified and costed by SOCs and reviewed by the relevant purchasing minister. If the minister considers that an existing or new activity or requirement meets the criteria of a CSO, it may be assessed for funding through the budget. Approved CSOs will then be subject to the same political, parliamentary, and budget scrutiny as all other expenditure proposals.

How are CSOs funded? Funding will depend on the government's prioritization and budget constraints. If a proposed CSO does not have clear social policy objectives, if the objectives are not a government priority, or if it fails to adequately address its objectives, it will not be implemented and funding will not be provided.

How are CSOs implemented? CSOs are specified through formal contracts between the Government Trading Enterprise (GTE) and the relevant portfolio Minister to increase the transparency and accountability for specification of policy objectives, evaluation of options, and delivery of the CSOs.

How are CSOs costed? CSOs that require additional services to be provided or services provided to a higher standard are costed on the basis of avoidable costs (i.e., the costs that would be avoided if the services were not provided, including a commercial return on incremental capital requirements). Pricing concessions are costed on the basis of the foregone revenue or rebate payments.

How are CSOs reported? In order to ensure adequate public and parliamentary scrutiny, details of all CSOs are required to be published in the annual reports of SOCs.

and the sensitivity of the receiving waters (which impacts on the level of treatment required). IPART has accepted this policy requirement, and consequently there are cross-subsidies, predominantly from customers in coastal and inner suburbs to customers in the western areas of Sydney including areas of new development.

There are two consequences of this. First, existing customers are subsidizing new customers on the urban fringe where typically the costs to serve are higher. Second, there are no

signals of which areas are more expensive to serve. This becomes important in the context of new greenfields development on the urban fringe. There are no clear signals that it is more economic to develop new housing within areas already serviced or that some new areas are more expensive to service than others. Out-of-sequence development can result in investment in more infrastructure, such as longer networks or new wastewater treatment facilities that will be underutilized for longer periods. Alternatively, it could be that terrain or other features make the area inherently more expensive to service. In any case it adds to the costs borne by other customers.

In the mid-1990s IPART created a developer charges policy to address these concerns.[17] Under the policy, developers would be charged an up-front fee for each equivalent lot being developed (calculated by the net present value of the cost of assets required to serve the development divided by the lots to be served, less the net present value of the net operating revenue per lot). Net operating revenue was the difference between annual revenues at the standard charges and the operating costs of the water and wastewater infrastructure serving the development. This signaled the costs of serving various new development areas, to encourage development in areas that are less expensive to serve. Developer charges were close to zero for infill development in some existing areas and ranged from $A 15,000 to $A 29,000 per lot for major new development areas on the urban fringe. However, following concerns about the impact of these charges on the cost of housing in Sydney, the government initially capped the developer charges in 2007 and then eliminated developer charges in the Sydney-Hunter regions in 2008.[18] This was a transparent policy made to pursue the government's urban development policy objectives, and was implemented via an instruction to SWC and HWC to not charge developer charges. In response, IPART allowed the costs previously recovered by developer charges to be recovered from annual charges for all customers from the next determinations.

Aside from the pricing issue, access to improved water and sanitation services is not a significant policy issue in New South Wales. There is virtually 100 percent connection of customers that could feasibly be connection in the major urban areas, and the issues of servicing remote communities (especially indigenous communities) is a much more significant issue in other states and territories, such as Western Australia, South Australia, and the Northern Territory. A recent review examining the provision of improved water supply in small (less than 150 persons) remote towns in South Australia highlighted these challenges (Willis et al. 2015). The provision of sustainable water services to remote communities in South Australia and elsewhere has been constrained by high delivery costs, low levels of cost recovery, inadequate local capacity or an unwillingness to pay for "improved" levels of service. Two key decisions are how services are provided and how they are funded (assuming the services cannot be fully funded from user charges paid by the customers served due to small population levels).

A range of service delivery models are used across and within the states, such as statewide water authorities, local governments, special purpose remote area service providers,

or specialized providers for indigenous communities, and the local communities. Where stat-wide, regional, or local government providers are used, services may be funded from subsidies generated from customers or ratepayers in other communities. The NWI (2004) recognized that it may not be feasible to service remote communities without some form of subsidy, and provided support for subsidizing services to these towns through a transparent, budget-funded CSO. However, the guidelines suggest (perhaps optimistically) that such CSOs should be temporary, where practicable, while governments pursue alternative service delivery and management arrangements.

Notes

1. At the time of separation of the SCA from SWC, the operating license for SWC was basically split into bulk water and retail and distribution functions.
2. Sydney Water operating license 2015-20. The license requires SWC to develop a methodology for determining its economic level of water conservation, which included water leakage, water recycling, and water efficiency.
3. The Victorian government established the Office of the Regulator General in 1994.
4. The AER is a separate decision-making body established in 2005, responsible for regulation of the energy sector that is a constituent part of the ACCC. It was established as part of the reform of sector regulation as more responsibilities were shifted from state to federal bodies.
5. The Western Australia government has, however, committed to transferring regulatory responsibility from the jurisdictional regulator (ERA) to the AER.
6. 2003-04 was the first year that significant competition payments were withheld (PC 2005).
7. GPT's review (1993) was the first industry review undertaken by the then-GPT after its formation.
8. The Victorian government established the Office of the Regulator General (ORG) in 1994. The ORG was later expanded to be the Essential Services Commission (ESC).
9. See the Metropolitan Water Directorate website, http://www.metrowater.nsw.gov.au/about/about-metropolitan-water-directorate, accessed July 1, 2016.
10. See the Metropolitan Water Directorate website, http://www.metrowater.nsw.gov.au/about/about-metropolitan-water-directorate, accessed July 1, 2016.
11. The directorate has produced long-term water plans for greater Sydney in 2004, 2006, and 2010.
12. See the Metropolitan Water Directorate website, http://www.metrowater.nsw.gov.au/planning-sydney/updating-plan/current-review.
13. NHMRC, Drinking Water Guidelines, 2011.
14. MOU between SWC and the Ministry of Health has recently been updated and a draft of the MOU is currently being exhibited prior to signing. See Sydney Water's website, http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq3/%7Eedisp/dd_047318.pdf.
15. Sydney Water operating license. Hunter Water operating license.
16. EPA, environment protection license for southern suburbs sewage treatment system including the Malabar STP issued under Protection of the Environment Operations Act 1997.
17. McNeill and Dollery (2000) provide a summary and evaluation of the methodology developed by IPART against economic efficiency criteria.
18. While the government eliminated developer charges for the Sydney-Hunter region, the DPI has adapted the methodology developed by IPART for use by country town water authorities. See New South Wales' website at http://www.water.nsw.gov.au/_data/assets/pdf_file/0011/663698/2016-Developer-Charges-Guidelines.pdf.

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Chapter 11 Commercialization and Corporatization

The New South Wales government began developing a more commercial policy framework for its businesses in the mid-1980s. Initially this involved setting clear commercial targets and dividends, establishing the government guarantee fee to equalize the cost of debt for government businesses with their private equivalents, and increasing the autonomy of the businesses. The process accelerated following the Commission of Audit commissioned by the Greiner government in 1988, and Hunter Water Corporation (HWC) and Sydney Water Corporation (SWC) were corporatized in 1991 and 1994, respectively. Reform was further complemented by other policies such as the community service obligations (CSO) policy (1994), which provided for the separation of commercial and policy objectives and the transparent delivery of social policy objectives on a commercial basis (New South Wales Treasury 1994).

New South Wales drew from New Zealand's earlier experience with the corporatization of its state-owned corporations (SOCs), and from the concurrent commercialization and corporatization policies of the Commonwealth and Victorian governments. However, unlike New Zealand, New South Wales did not establish a separate shareholding monitoring unit, and did not separate the policy and shareholder monitoring functions with Treasury as cleanly as the New Zealand Treasury did. Furthermore, shareholding ministers sometimes also held the relevant policy portfolio, muddying the separation of the ownership and policy roles.

The Independent Pricing and Regulatory Tribunal (IPART) report on the performance of the SOCs in 2010 raised these issues and questioned whether the corporatization model had become diluted, recommending a strengthened ownership monitoring function (IPART 2010).There are well-founded concerns that corporatization is a potentially unstable, "second-best" option requiring constant vigilance. Otherwise, the natural incentives will either see it move to full privatization or slip back into less commercial and more politically driven modes of operation. Nonetheless, corporatization is more desirable than the option of a noncommercial, politically driven entity.

11.1. Commercial Policy Framework

The framework was underpinned by five key principles for government-owned businesses:

- **Clear objectives.** Providing management of government businesses with clear commercial objectives (i.e., removing or isolating social and regulatory objectives, which may conflict with the commercial objective)
- **Managerial authority.** Ensuring key internal operating decisions are made by managers with strong incentive to maximize the value of the firm (rather than through externally imposed controls)

- **Performance monitoring.** Subjecting government businesses to rigorous, independent monitoring and assessment of financial performance
- **Rewards and sanctions.** Establishing managerial rewards and sanctions related to performance
- **Competitive neutrality.** Removing the special advantages and disadvantages that apply due to government ownership and preventing the abuse of any market power[1]

The Commercial Policy Framework arose out of the New South Wales Commission of Audit (Curran Report) of 1988. The commission considered that there were major problems with New South Wales's ability to fund services, including that (a) the state had very large unrecognized and unfunded liabilities for superannuation and other employee entitlements; (b) there were rising levels of debt, and servicing this debt placed a drain on the state's ability to provide services to the community; (c) there were rising levels of debt, and servicing this debt placed a drain on the state's ability to provide services to the community; and (d) the assets of the state were poorly managed and yielded a low return on investments.

The Curran Commission of Audit recommended a review of functions to eliminate non-core activities, a reduction in debt through asset sales, and increased emphasis on balance sheet management. For government businesses, this was to happen through corporatization in order to improve returns from operations. Key messages are that commercial independence in practice falls short of the theory and legislated independence, and good monitoring and supervision of corporatized entities requires constant vigilance and a high level of skill. Part of the challenge is to protect and maintain a commercial focus and independence.

The primary aim of the policy was to improve the efficiency of government-owned businesses. The policy had two stages for improving efficiency. The first stage, commercialization, involved administrative changes to the operation and management of businesses along the lines of the first four principles. The second stage, corporatization, involved the establishment of a corporate governance structure, which paralleled that of a publicly listed company. All five principles of the framework, including competitive neutrality in input and output markets, must be satisfied prior to corporatization.

Corporatization involves the establishment of a legislative framework and corporate governance structure, which mirrors as far as possible that of a publicly listed company. This creates the basis for a more separated relationship between the SOC board and management, and the government as owner or shareholder. SOCs are incorporated under the State Owned Corporations Act 1989. The Act establishes two classes of SOC: company SOCs and statutory SOCs. Currently all New South Wales SOCs are statutory SOCs.[2]

Statutory SOCs are not subject to the Corporations Law, but the key provisions of the Corporations Law have been included in the SOC Act. A statutory SOC is established by an Act of Parliament (that is, its enabling legislation). HWC was established by the Hunter Water (Corporatisation) Act 1991 and SWC was established by the Sydney Water (Corporatisation)

Act 1994. The commercial policy framework replicates the disciplines and incentives that promote efficient commercial practices in nongovernment businesses. It includes the following:

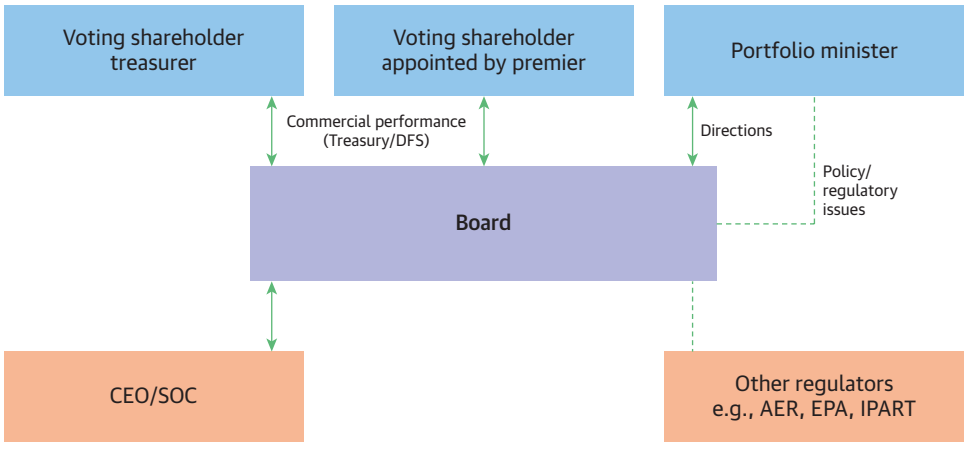
- **Governance policies.** Guidelines for Boards of Government Businesses; CEO Contract Guidelines for Government Businesses; State Owned Corporation Indemnity Policy
- **Performance policies.** Reporting and Monitoring Policy; Capital Structure Policy for Government Businesses; Financial Distribution Policy for Government Businesses
- **Competitive neutrality policies.** Government Guarantee Fee Policy for Government Businesses; Tax Equivalent Regime Policy for Government Businesses; Social Program Policy for New South Wales Government Trading Enterprises
- **General policies.** Guidelines for Assessment of Projects of State Significance; Characteristics of a Fully Corporatised Government Trading Enterprise, Community Service Obligations Policy

The fundamental objective of corporatizing the HWC Board and SWC Board was to set clear objectives, separate social and other responsibilities to be undertaken by the relevant arms of government, and focus the SOC on providing efficient services for the benefit of consumers and taxpayers (as the beneficial owners). (See Figure 11.1.)

HWC and SWC were originally corporatized as company SOCs. In 1998, they were made statutory SOCs under the Water Legislation Amendment (Drinking Water and Corporate Structure) Act 1998 (New South Wales).

The key outcome of this change was that the portfolio minister held more power to get information from, and to direct, a statutory SOC than for a company SOC. While it increased

FIGURE 11.1. Statutory State-Owned Corporation Governance Model



Source: New South Wales Premier and Cabinet 2013.
Note: DFS= Department of Finance and Services;, AER = Australian Energy Regulator.

the power for the portfolio minister to make such directions, the directions must be in writing and made public, making the minister more accountable for the actions of SOCs. One of the tensions in the SOC model is the reconciliation of commercial autonomy for the SOC with the minister's accountability to Parliament for the SOCs actions.

At the heart of the framework is the establishment of clear commercial objectives and better incentives, and monitoring of the corporation's performance against these objectives. One key principle underlying corporatization is a clear distinction between the minister's role in setting broad frameworks within which the corporation should operate, and the role of the board.

The Sydney Water Act requires that the directors have, between them, expertise in business management, protection of the environment, and public health.[3] The Hunter Water Act provides that, of the eight board members, seven are to be appointed "for their relevant expertise" (the eighth is the chair). The legislative framework is intended to provide a level playing field for government-owned and private businesses.[4] Requiring, for example, environment and public health expertise on SWC's board in which the equivalent is not required for private utilities (or even all public utilities) is inconsistent with that intent. It may be an impediment to the SOC's commerciality if the voting shareholders are hampered in a way private sector shareholders are not (IPART 2010). On the other hand, it is important to note that the directors are not intended as representatives of any particular interest group, such as employees or customers. Their duty is to ensure that in pursuing its charter the SOC is a good corporate citizen, and to protect and enhance its commercial interests. Furthermore, a private water utility would want to have board members with similar qualifications given that failure to comply with health and environmental standards or failure to understand the nature of the risks of noncompliance is an existential risk for a water utility.

11.2. Financial Framework for State-Owned Corporations

The New South Wales Treasury is responsible for ownership monitoring and establishing the financial framework for SOCs. Central to this is the monitoring and reporting framework providing agreement on the Statement of Corporate Intent (SCI) between the shareholding ministers and the SOC's Board. The SCI sets out the agreed financial and operational performance targets from an ownership perspective, and includes agreed targets for the return on assets and dividends, as well as the financing strategy to ensure the business is financially sustainable and provides a commercial return. This is supported by policy statements on guidelines for boards and CEOs, financial distribution policies, tax equivalent payments, financing and capital structure, and loan guarantee fees.

The focus is on providing a framework that mimics as closely as possible the governance and operating framework of a private sector firm, while protecting the ownership interest of the government. As the representative of the shareholding ministers, the Treasury agrees on the broad financing strategy with the SOC. Once this is agreed, TCorp (a New South Wales government financial SOC) provides debt management services to the SOCs.

This is comparable to the services provided to private sector firms by banks and financial intermediaries except that the SOC does not have the choice of who it uses, and must use TCorp; and TCorp issues debt in its own name, backed by the New South Wales government, rather than the name of the SOC.

As the New South Wales government has an AAA-rating, TCorp can borrow at a lower rate than the SOCs could if they raised debt in their own name without the benefit of a government guarantee (implied or actual). To ensure that the SOCs see the true cost of their debt and that there is competitive neutrality, the SOC is rated as an independent stand-alone entity and pays to the New South Wales government a loan guarantee fee equivalent to the difference between the borrowing cost for an AAA-rated entity and a business with the same rating as the SOC. Under the monitoring and reporting framework[5] the SOC must do the following:

- Prepare a business plan in consultation with New South Wales Treasury that is the basis for the annual SCI
- Demonstrate a commitment when undertaking corporate planning to achieving financial and nonfinancial objectives and targets agreed in the SCI
- Sign an SCI, which represents an agreement with the government on the objectives and obligations by which the business will operate over the next 12 months and following years
- Provide quarterly performance reports and other requested information to their relevant minister and New South Wales Treasury on behalf of the treasurer
- Provide timely disclosure of information which may have a material effect on the value of the business, including information which may influence government decisions
- Have in place robust internal procedures for capital projects and provide information to New South Wales Treasury on major capital projects, including quarterly reports

The government first established dividend and rate of return (ROR) targets for its businesses in 1986 when it commenced commercialization. The government's equity in its SOCs has been built up through initial equity contributions, retained earnings, and asset revaluations. Dividends provide a return to the government, and taxpayers, in recognition of the opportunity cost of the funds tied up in these businesses. Under the distribution, policy dividends can be either normal dividends and special dividends, or capital repatriations in exceptional circumstances.[6] The principles underlying the approach in setting the dividend policy are that: government businesses are expected to make annual dividend payments and the shareholders' preference is for a stable stream of annual dividend payments. In addition, dividend policy is set by negotiation between the shareholders and the board of each business. However, shareholders have the ability to make the final decision on the dividend policy. The policy is to cover at least three financial years, but is subject to shareholder approval of the dividend to be declared each year. Dividend target is expressed as a dividend

payout ratio, i.e., as a percentage of distributable net profit after tax. Finally, the government may, from time to time, have specific dividend policy expectations or considerations (including the overall budgetary position) that must be taken into account in setting dividend payments for a particular business (or group of businesses). Otherwise a dividend payout ratio of 70 percent is used as the initial reference point in dividend policy negotiations.

A closely related component of the financial framework is the capital structure policy.[7] In regulating the water businesses, IPART assumes a debt to equity ratio of 60:40. This applies to government-owned and private sector water businesses, and is in line with the assumptions used by other regulators. However, the actual gearing ratio is a matter for agreement between the shareholding ministers and the water utilities.

The objective of the Capital Structure Policy is to "ensure that Government businesses are financed by an appropriate mixture of debt and equity. The policy outlines a commercially based methodology for determining an appropriate capital structure and a minimum-to-maximum capital structure range for a government business. The methodology establishes surrogate mechanisms that replicate the disciplines and incentives of debt and equity markets."[8] For private sector firms, if gearing becomes too high debt providers will require higher interest rates or limit the debt provided, and if gearing is too low shareholders will be concerned that value is being lost. These incentives are not as direct or strong for government-owned businesses, and the policy on debt management attempts to correct for this. The policy is intended to ensure these businesses do not hold special advantages over their private sector competitors. Under the policy, the business must undertake a comprehensive capital structure study before agreeing the capital structure limits with the shareholding ministers.

The first stage in determining the capital structure for a government business involves a cash flow, based-risk analysis in order to determine the debt capacity of the business. This risk analysis involves constructing a model to analyze the cash flows, and undertaking sensitivity analysis of the impact of key variables on the cash flows. An outcome of the cash flow and risk study is a recommendation for an appropriate capital structure within a minimum-to-maximum capital structure range that provides for flexibility given the "lumpy" nature of capital expenditure of many government businesses; the government's preference for a relatively stable stream of total dividends from its portfolio of businesses; and the need to allow for contingencies. The range will vary for each government business, depending on the volatility of its cash flows and the competitiveness of the market in which the business operates. The capital structure and range must also be consistent with the maintenance of an appropriate investment grade rating, plus the ability to meet key debt service criteria and capacity to finance the approved capital expenditure program through a mix of internally generated cash flows and debt.

While the board is responsible for the management of the utility's capital structure within these limits, TCorp is responsible for raising debt and advises the utility on debt management strategies. TCorp raises funds primarily through bond raisings in local and off-shore

markets backed by the New South Wales government's AAA rating. Its debt raising covers the needs of general government and its businesses. TCorp issues debt of various terms, and in recent years has recommenced issuing inflation-indexed bonds. TCorp also advises the utility on appropriate debt management strategies, in terms of the portfolio of maturities, types of debt and timing of debt raising. However, the utility is ultimately responsible for its debt strategy, and debt is assigned to the utility based on the agreed strategy.

Government businesses are required to pay tax equivalents and government guarantee fees. These payments do not constitute financial distributions, since they represent neither a return on, nor a return of, the government's equity investment in the business. Rather, these payments represent expenses incurred by government businesses determined in accordance with competitive neutrality principles.

State government-owned businesses are not subject to commonwealth company tax. The New South Wales government introduced tax equivalent payments by its commercial businesses in the early 1990s, prior to the requirement for such payments under the NCP. HWC commenced making tax equivalent payments in 1991/92 and SWC in 1992/93. Over time, the calculation of tax equivalents has become more sophisticated to better approximate the payments that would be made by private sector businesses.[9]

The Loan Guarantee Fee was introduced in 1987 as part of the initiatives to establish a more commercial, competitively neutral framework for the government's businesses. Its objectives were to (a) ensure the cost of debt to the SOC was comparable to the cost of debt for a private sector business in a similar financial position, facing similar funding needs and risks; and (b) strengthen the incentive for better financial management.

IPART sets a benchmark weighted average cost of capital (WACC) meaning that if the utility can lower its effective cost of capital through better management, it retains the benefit. However, in the absence of the loan guarantee fee, the utility would get not get the full benefit of better financial management and performance. A private sector firm's rating and cost of debt is a function of the quality of its management. The guarantee fee seeks to replicate this incentive for a SOC. The guarantee fee is calculated with reference to the business' stand-alone credit rating; the credit spread on corporate debt with similar credit ratings; the notional term of the debt (for regulated businesses, this will depend on the Regulator's notional debt allowance tenor); and the amount of debt held by the business. All government businesses subject to the guarantee fee must obtain an annual credit rating on a stand-alone basis. The stand-alone credit rating measures a business' financial standing independent of explicit or implicit financial support from the government.

Credit rating agencies undertake assessments that are forward-looking, and therefore a credit rating of a government business is an assessment of its ability to meet its current and forecast debt obligations. Where a business's credit rating changes, no change will be made to the guarantee fee on historic borrowings. The changed credit rating will be applicable from the start of the month following the date of the official downgrade or upgrade.

While the policy seeks to replicate the debt incentives of a private sector firm that has been replicated by other states in Australia, there may be concerns that it imposes guarantee liabilities on the government and keeps the utility tied to the government. Firstly, it is difficult for the government to avoid having a guarantee liability in regard to the debts of its major businesses. When the rating agencies look at the rating of the government they look not just at the debts and financial position of the budget-funded activities, but that of the government as a whole, including its trading enterprises such as the water utilities. This was the case prior to the establishment of TCorp, when the utilities could borrow in their own name. In effect, the ratings agencies assumed an implicit guarantee whether or not there was an explicit guarantee. The potential impact of allowing a utility owned by the government to default on its debts was viewed as unacceptable due to its impact on financial and political reputation.

Second, the constraints on the utilities' debt levels occur via the requirements to agree capital structure limits and investment levels under the capital structure policy and SCIs, rather than the requirement to raise loans through TCorp. In this regard, the relationship may more closely parallel that of a tightly owned subsidiary rather than that of a widely held stock.

11.3. Sustainability of the State-Owned Corporation Model

Successfully managing government organizations for the efficient delivery of services perceived to have a mix of economic and social purposes has been a long-term challenge for governments. To some extent, corporatization is the reinvention and refinement of the earlier Morrisonian principles,[10] under which there was to be a clear separation of the business from the minister, with a board appointed for their technical and business competence. The government could provide general directions and broad strategic guidelines but barriers were created to protect against ministerial interventions in the business. The failure of this model in the United Kingdom led Prof. George Jones to advise New Zealand that:

> Britain for over a generation we have experienced corporatization and my conclusion is that it does not work... and that NZ really faces a critical choice. It can go in two directions. In one direction it can say we need full political accountability for these activities, in which case the functions should be put in a department or local government, with the responsibility focused on politicians. If you're not prepared to select that solution, the only choice is the market - full privatisation. E Groom, *The Curran Report and the Role of the State,* Australian Journal of Public Administration, Vol 49, No. 2, June 1990, p149.

In practice, there will be internal pressures to move to privatization. If successful, corporatization will change the culture within the organization. However, this new culture will conflict with the remaining constraints from public ownership. For example, the constraints on

diversification and the inability to offer share issues and practical constraints on bonuses may cause internal pressure for privatization. Furthermore, while corporatization seeks to replicate the governance incentives and performance monitoring systems for private companies, it cannot fully do so. Governments, as owners, are generally poor managers of risks and the "market" for performance monitoring is far shallower: it is left to Treasury and Finance, rather than a pool of market analysts competing to provide advice. There is not the same threat from takeovers to motivate efficient financial management and operational efficiency. Notwithstanding the efforts to replicate the pressures from debt markets, lenders may be less vigorous in monitoring the performance of the SOCs because of the perceived implicit government guarantee. In practice, remuneration of the senior management, especially CEOs, is lower in SOCs and will not include share bonuses that are used in private sector firms to try to better align incentives to the longer term financial interests of the firm.

On the other hand, there are always informal channels for actual or implied intervention and influence by ministers and policy agencies that the SOC may find difficult to resist. The public often infers a public purpose for businesses such as water utilities, which leads to pressures for intervention. There will always be groups that disagree with aspects of the SOC's operation, leading to political problems. The incentives for interventions also remain, and there will be opportunities where it is perceived that the SOC could be nudged to deliver better social or political outcomes at only a small economic or financial cost. Perversely, if the corporatization is successful in improving performance, the perceived costs of intervention may diminish over time as memories of past poor performance and its consequences fade.

This suggests that maintenance of the SOC model requires the establishment of very strong, well-resourced systems for monitoring and reporting ownership interest, and strong and effective barriers to ministerial or departmental interventions in the operation of the SOCs. Even so, while the stability of the model cannot be assured, imperfect implementation of the SOC model is currently better than its predecessors.

In New Zealand, most of the government's businesses were fully or partially privatized. The government retains a minority interest in Air New Zealand and three energy companies (Might River, Genesis, and Meridian). The major SOCs it still wholly owns are NZ Post, Transpower (the transmission grid owner), and KiwiRail. Reviewing evidence on the performance of the New Zealand SOCs, Irwin and Yamamoto note that "Concerns are often expressed, however, that the benefits of corporatization are somewhat fragile and that reforms have not brought all the benefits that privatization would." (Irwin and Yamamoto 2004, 29) Despite this, they conclude that there is no strong evidence of declines in performance of the SOCs over time. This may reflect the resources and rigour applied to supervision of the SOCs in New Zealand in particular, as Kikeri, Nellis, and Shirley concluded from a broader international review that "performance improvements have proved difficult to sustain once the crisis that instigated the reforms has dissipated." (Irwin and Yamamoto 2004, 19)

11.4. Status of the State-Owned Corporation Model in New South Wales

In its 2010 *Review of the Productivity Performance of State Owned Corporations*, IPART found that "the current framework addresses or seeks to address the most important factors considered necessary to ensure that state owned businesses have the incentives and conditions to operate efficiently, and is based on sound principles. ... [Yet] the current arrangements for implementing this framework are not always consistent with these principles." (IPART 2010, 67) There are two key issues in the integrity of the SOC model: the strength and respect for the barriers to ministerial or department interventions, and the strength of the ownership supervision and monitoring.

11.4.1. Strength of Ownership Supervision and Monitoring

New South Wales Treasury, on behalf of the shareholders, plays a critical role in monitoring and assessing the performance of the SOCs, reviewing short- and long-term business plans to maximize business value, and applying managerial rewards and sanctions for performance. How effectively and thoroughly it performs this role, and follows up on poor performance, determines whether this monitoring acts as an effective incentive for SOCs to improve. IPART noted that recent structural changes within Treasury had separated its policy and budget advisory roles from its shareholder advisory role in relation to the SOCs. IPART supported these changes, noting that they would help in accounting for, and prioritizing, the conflicting objectives of government as SOC owner (IPART 2010).

However, to translate these structural changes into improved SOC performance, it is vital that Treasury performs both roles thoroughly and actively. For example, in performing policy and budget advisory roles, Treasury should focus on the impact of the SOCs' performance on the state's finances and economic efficiency. This ensures that regulatory or policy proposals involving SOCs and impacting the budget or broader economy are scrutinized in the same way as any other proposal affecting other businesses.

The shareholder monitoring function ensures that all relevant legislation, policies, and shareholding ministers' expectations are clearly communicated, and SOC boards have appropriate regard for them. Currently, shareholder monitoring focuses primarily on the SOCs' financial performance. While important, this focus may not adequately capture productive efficiency and additional requirements that SOCs are asked to fulfill. IPART considered that productivity and benchmarking analysis should be incorporated into management and supervision of the SOCs, by their management or board and New South Wales Treasury and shareholders.[11] This would require the systematic collection of data on the SOCs' outputs and inputs, and effort to improve the specification and measurement of these. Improved quality of data over time would help SOC management, the board, and shareholding ministers agree on what should be produced and how, set practical performance targets, and consider the impact of policy requirements and standards on outcomes, costs, and performance.

11.4.2. Strength of Barriers against External Interventions

While the barriers to ministerial or departmental interventions have been established, there are questions as to whether they are fully effective. However, this is difficult to test as the directions and influences that contravene the SOC principles are unobservable—or at least intended to be.

Clear policy directions, such as directions to build the desalination plant, provide rebates to customers on social welfare benefits, or extend sewerage services to remote customers, do not contravene the SOC principles as long as the directions are transparent and properly made, and the costs of delivering these outcomes for the government are fully funded on a commercial basis. If these conditions are fulfilled, the government becomes another customer purchasing services from the utility.

In relation to rebates to customers on social benefits, these were fully funded by the government. In the case of the SDP, as provided under the IPART Act, the government publicly instructed IPART to pass through the efficient costs of building and operating the SDP. Since all customers of SWC benefitted from the increased water security, it was appropriate that the customers bear the costs rather than taxpayers. However, the process removed the evaluation of the appropriateness of this decision from regulatory scrutiny.

In its early operating license for SWC, the government included a license obligation for SWC to connect to reticulated wastewater services customers that were expensive to service in this way.[12] Alternative systems for managing wastewater were often feasible but less well accepted by the government and the community. Unlike as it did with the Sydney Desalination Plant (SDP), the government did not provide a direction[13] to IPART to pass through these costs, and it could be argued that the costs of connecting the uneconomic customers should have been funded by the government as a CSO. IPART could have chosen not to pass through the costs on the grounds that the costs of connection were excessive to the benefits. However, as it was a transparent license obligation that SWC had to comply with, IPART allowed the costs to be recovered as part of the wastewater charges for all SWC's customers. The alternative of requiring connecting customers to pay the full cost of connection, while within the power of IPART, would have been inconsistent with a transparent policy of the government on up-front contributions for connecting customers.

The costs of connecting these customers were small relative to SWC's total costs, but is an example of an often difficult and challenging issue for regulators. That is, should the regulator accept transparent and legitimately made policies of government in setting prices, even where they may intrude on the discretion provided to the regulator in the exercise of its power? While not explicitly stated, IPART's actions in this and other cases are consistent with its high degree of independence as an unelected delegated decision maker that should not override transparent legitimately made policies of the elected government.

Of greater concern are the nontransparent directions and influences. Although IPART did not document specific examples in its report on the performance of the SOCs in 2010, it did comment that:

> At a roundtable discussion in December 2009, the SOCs asserted that several additional factors affected their productivity. These included government decisions that influenced their production choices; internal constraints on improving labor productivity; and the New South Wales Public Sector Wages Policy, which while providing overall benefits also constrains the sources from which productivity savings to fund wage increases can be found. (IPART 2010, 9)

> *Most of the SOCs (excluding those in the energy sector) raised concerns about decisions by the Government that affect their production choices and autonomy. Examples include procurement and wage policies, and directions issued under the State Owned Corporations Act 1989 (the SOC Act). Some SOCs indicated that it was not uncommon for them to receive instructions from portfolio ministers on how they should undertake their functions. Such occurrences were considered to create tension between the SOC's accountability to shareholding ministers and the portfolio minister .... Some SOCs also asserted that there are government constraints and interventions on hiring and firing (including a 'no forced redundancies' policy), and on out-sourcing and in-sourcing, and the conditions and types of employment offered. However, this was not the experience of all SOCs, and some seemed to be more subject to government involvement than others. These SOCs put the view that any substantial improvements in productivity are contingent on being able to make decisions on such matters. For example, outsourcing may not only provide a way of managing skills shortages and reducing costs, but it facilitates changes to business practices and allows internal staff effort to be re-directed towards strategy and planning, rather than on service functions that could equally be undertaken by others. Crucially, they considered that such constraints on authority made it difficult to create high performing cultures. (IPART 2010, 66-67.)*

Anonymous reporting reinforces the nature of the problem, and this issue is not unique to New South Wales. IPART identified this as a weakness in the implementation of the SOC regime and recommended that the government strengthen the autonomy of the SOCs. An important element was the recommendation that the government establish a minister for SOCs who would be on the board of all the SOCs, and who had joint responsibility with the treasurer for monitoring the performance of the SOCs and protecting the government's ownership interest.

Notes

1. New South Wales Government, Commercial Policy Framework, http://www.treasury.nsw.gov.au/Commercial_Policy_Framework/Commercial_Policy_Framework_Index
2. Initially SWC and HWC were established as company SOCs.

3. Sydney Water Act 1994, section 5A.
4. Hunter Water Act 1991, section 4B.
5. New South Wales Treasury, Reporting and Monitoring Policy Framework for Government Businesses, TPP 05-2, November 2005, www.treasury.nsw.gov.au.
6. New South Wales Government, Financial Distributions Policy for Government Businesses, TPP 14-4, May 2014.
7. New South Wales Treasury, Capital Structure Policy for Government Businesses, TPP 02-7, September 2002.
8. New South Wales Treasury, Capital Structure Policy for Government Businesses, TPP 02-7, September 2002.
9. New South Wales Treasury, Tax Equivalent Regime for Government Businesses, TPP 03-4, June 2003.
10. The British model of the public corporation is widely known as the "Morrisonian'' model. In advocating the use of the public corporation, Herbert Morrison sought a combination of public ownership, public accountability and business management for public ends. For details of the Morrisonian model see Morrison (1933).
11. This recommendation covered all SOCs, not just those regulated by IPART. While IPART had in interest in undertaking benchmarking to assess efficiency, it is no less important for the management of the SOC to undertake benchmarking as a basic management tool in order to support their accountability to the Board and demonstrate their performance to the shareholders.
12. The Priority Sewerage Program (PSP) was initiated by the New South Wales Government in the 1990s. The program provides improved wastewater services to selected existing but unserviced urban towns and villages in environmentally sensitive areas, identified at that time by the EPA. PSP schemes were first delivered by SWC and largely funded through charges from SWC's wastewater customers. From 2005, specific obligations to deliver and plan for PSP schemes were included in SWC's operating license. SWC's current operating license does not refer to the PSP.
13. The requirement to connect these uneconomic customers preceded the amendment of the IPART Act (section 16A) allowing the government to direct IPART to include in the maximum price an amount representing the efficient cost of complying with a specified requirement imposed on the agency.

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Chapter 12 Increasing Role for the Private Sector

Private sector participation in the water sector is increasing, initially sparked by an unsuccessful proposal for access to Sydney Water Corporation's (SWC's) wastewater network, which gave rise to the Water Industry Competition Act (WICA). This act set out the rights and conditions for private suppliers of water and wastewater services, and most of the 22 private service providers licensed under WICA have revolved around the provision of recycled water for commercial and residential developments. The largest increase in private participation in the sector came with the sale of the SDP to the private sector. This sale may increase the opportunities for greater private sector participation in the future, since it has removed one of the important barriers: constraints on access to bulk water supplies.

12.1. Development of Private Participation and Competition

In 2004, Services Sydney, a private company, sought to become a competitor with SWC as a provider of sewage collection and treatment services.[1] Services Sydney planned to provide a sewerage retail, collection, and disposal service to end use customers, using SWC's network, and extract the sewage before the sewage treatment plants to use in its production of recycled water.

In 2005, under the Trade Practices Act, Services Sydney successfully applied to have the North Head, Bondi, and Malabar sewerage networks declared.[2] This meant that SWC was compelled to allow Services Sydney and others to seek access its reticulation networks.

SWC and Services Sydney could not reach an agreement on the access-pricing methodology, and it was referred to the Australian Competition and Consumer Commission (ACCC) for arbitration in 2006 (ACCC 2007). The ACCC determined largely in favor of SWC's proposed retail, minus avoidable cost approach to determining access prices (ACCC 2007). This access pricing approach was consistent with the retention of postage stamp pricing. Services Sydney has since abandoned its plans to compete with SWC.

Independent Pricing and Regulatory Tribunal's (IPART's) role in the Services Sydney process was limited. Under the legislation at the time,[3] Services Sydney made its applications to federal bodies: the National Competition Council (NCC), the Australian Competition Tribunal, and the ACCC under the National Access Regime. However, in 2005, IPART was directed by the New South Wales government to review and provide advice on pricing principles and alternative arrangements for the delivery of water and wastewater services in the greater Sydney region, including possible private sector involvement (IPART 2005a).

This review was conducted in the context of the Services Sydney access application. It was also carried out amidst concerns about Sydney's water supply and demand balance. IPART recommendations from this review were aimed at increasing the scope for competition, private sector involvement, and innovation in the water industry. IPART was particularly focused on the potential for competition to promote innovation in the development of new water supply sources (IPART 2005a).

IPART reported on the alternatives for the provision of water and waste water services in the greater Sydney region. IPART found efficiency could be enhanced and more innovative solutions forthcoming if more work was contracted out by SWC, and if third parties were encouraged to access the trunk network to supply competitive services (IPART 2005a). IPART also considered how private sector involvement might affect the present system of uniform pricing for water across the Sydney region, and whether the access regime might lead to selective service whereby the private sector had an incentive to service only those clients whose service costs were relatively low.

There were two key elements of IPART's recommendations. First, IPART recommended greater and more effective use of outcomes-based competitive procurement by water authorities, particularly in relation to additional water supplies. Second, IPART recommended a regime allowing open access to monopoly infrastructure. Under this regime, new entrants could seek access to the incumbent's monopoly water or wastewater transportation networks in order to compete in upstream or downstream services (e.g., wastewater treatment and retail services) (IPART 2005a).

The New South Wales government responded to that IPART report; the new WICA 2006 requires the natural monopoly elements of the major water utilities to be opened up and accessed by other parties, and provides a licensing regime for nongovernment utilities. These other parties, subject to certain conditions being satisfied, are then free to market a range of services to their customers, and customers will be free to choose their water service provider. The water service providers will have to pay for any transportation services provided by the incumbent infrastructure owner, but will be free to develop products and services desired by consumers, subject to regulatory requirements. The increment earned on the value added services will, of course, be retained by the new service provider.

WICA commenced on August 8, 2008,[4] and allows private operators to provide services in competition to SWC. To date there has been no third-party access, and competition has been limited to a number of small-scale schemes, as was expected.

WICA seeks to harness the innovation and investment potential of the private sector in the water and wastewater industries, while also ensuring the continued protection of public health, consumers and the environment. The purposes of the act are to establish (a) a third-party access regime, to enable new entrants to access existing water and wastewater infrastructure; and (b) a licensing regime, to ensure that private providers of water, wastewater, and recycled water services protect public health, the environment, and consumers.[5]

The licensing regime is complementary to, but distinct from, the access regime. That is, it is possible for a new entrant to be licensed to operate infrastructure or provide retail services without necessarily requiring access to the incumbent utility's infrastructure services (e.g., through operation of a standalone wastewater treatment or recycled water supply system). To date, many of the WICA licensees have relied on purchasing "wholesale" water or sewerage services from SWC and Hunter Water Corporation (HWC). That is, they are purchasing a bundled product, for example a bulk water, treatment and transportation package

(rather than just transportation, which would occur under access), to then on-sell to end-use consumers. The access regime has thus been by-passed, to date. According to the pricing principles for the access regime for any infrastructure service, the price of access should do the following:

- Generate expected revenue for the service that is at least sufficient to meet the efficient costs of providing access to the service, and include a return on investment (ROI) commensurate with the regulatory and commercial risks involved
- Allow multipart pricing and price discrimination when it aids efficiency
- Not allow a vertically integrated service provider to set terms and conditions that discriminate in favor of its downstream operations, except where the cost of providing access to other operators is higher
- Provide incentives to reduce costs or otherwise improve productivity[6]

These principles must be implemented in a manner that is consistent with any relevant pricing determinations for the supply of water and the provision of sewerage services, including where applicable the maintenance of postage stamp pricing (that is, a system of pricing in which the same kinds of customers within the same area of operations are charged the same price for the same service).[7] A corporation (other than a public water utility) must obtain a license to (a) construct, maintain, or operate any water industry infrastructure; (b) supply water (potable or nonpotable); or (c) provide sewerage services by means of any water industry infrastructure.

The Metropolitan Water Directorate has undertaken a periodic review of the WICA (2006).[8] In response to the review, extensive changes to the WICA licensing framework were recommended and passed by the New South Wales Parliament in October 2014, published as the WICA (Review) Act 2014. The amended act will focus the licensing regime of utility-like schemes, provide entity-wide licensing, remove barriers to entry for the private sector, strengthen customer protections, ensure penalties reflect activities being regulated, and provide review and appeal provisions.[9] The amended WICA was scheduled to commence in mid-2016, however this has been delayed.[10] The Water Industry Competition (General) Regulation 2008 (WIC Regulation) is currently being revised to reflect amendments to the WICA.

12.2. Benefits of Competition

Competitive markets deliver better outcomes for customers than regulated markets. In a competitive market, suppliers strive to win customers by lowering costs or providing a better product, in terms of quality, price and timeliness. Where the market is not open to competition, economic regulation can restrict the power of suppliers by limiting their ability to extract monopoly rents from customers, and drive ongoing productive efficiency. However, it is difficult for regulators to achieve the allocative and dynamic efficiency and innovation

of competitive markets. That said, competition should not be introduced without reason. It should occur only where competitors are more innovative or have lower cost structures than the incumbent.

There are a number of benefits of allowing for competition in the water sector. These include technological innovation, and new solutions and business models; reduced capital expenses (CAPEX) requirements for SWC; and accelerated development and connection of new areas, and reduced costs.

Increasing the scope for competition, private sector involvement and innovation in the industry will create a more dynamic market, in which private sector participants compete to provide innovative water and wastewater services that meet customers' needs.

12.3. Challenges Arising from Competition

Establishing a regime to facilitate competition also creates a number of challenges. Impediments to establishing a competitive environment include variations in license conditions and noncommercial obligations, postage stamp pricing and cross-subsidies,[11] and absence of an adequate access pricing regime.

12.3.1. License Conditions and Noncommercial Obligations

Distortions or barriers to competition can arise from differences in license conditions and noncommercial obligations that may be imposed on government-owned utilities. Where this imposes costs on or creates opportunities for the utility that the private provider would not also face, it distorts competition and can result in inefficient entry of new service providers.[12] For the government, new entry can reduce its capacity to achieve its policy objectives. In principle, the license conditions for public and private service providers should minimise disadvantage for one provider type over another. In practice this can prove to be very difficult.

For example, previous license conditions on SWC included obligations on water efficiency and greenhouse gas reductions that would not apply, or would be difficult to apply, to multiple smaller-scale service providers.[13] There are also obligations for supply that apply to the government water utilities but not to new private entrants. With the framework elements of competitive neutrality in place (a sound Community Service Obligations [CSO] policy and transparent, independently administered licencing arrangements), the challenge is to ensure that (a) the license conditions are comparable for all providers, notwithstanding the differences in size and market position or the incumbent government-owned utility and the new entrants; and (b) that the CSO policy covers all relevant noncommercial obligations, and CSO payments are equally available to the incumbent and new entrants.

12.3.2. Postage Stamp Pricing

Traditionally, water and related services have been charged on a postage stamp basis, under which all customers of a water supply authority are charged for services at the same price

regardless of location. A common price for essential services is commendable from a social equity viewpoint. Postage stamp pricing is generally preferred because it is transparent, ensures equity to all similar customers, and is simple to administer. However, postage stamp pricing also hides the true costs of providing service to different customers and thereby gives rise to hidden cross-subsidies (Frontier Economics 2008).

Postage stamp pricing is current government policy. This is reflected in the WICA, where the principles of access pricing must be consistent with maintaining postage stamp pricing.[14] However, IPART has suggested that postage stamp pricing, combined with the removal of cost-reflective developer charges for water and sewerage services in Sydney and the Hunter, has impeded competitive entry (IPART 2014). This is because most areas of potential entry are on the urban fringe and have higher than average costs of service. The incumbent is able to service the growth area at the postage stamp price, using its large customer base to subsidize growth expenditure, while new entrants must recoup all their costs through charges to new customers.

The challenge for IPART is to maintain postage stamp pricing while limiting exploitation of resulting arbitrage opportunities. IPART proposed to price regulation for wholesale services provided by public water utilities to wholesale customers who then on-supply services to their own end customers through a retail minus approach (IPART 2016a). This approach is also called the "efficient component pricing rule," and in principle addresses the problem where access to the existing network is required. However, it does not prevent distortions of postage stamp pricing where the alternative solution does not require access to existing infrastructure.

12.3.3. Access Pricing Regime

Competition requires an effective access regime, as in many cases the competitor will require access to existing water or wastewater networks. Pricing arrangements under this regime need to be clear, so potential competitors can assess their opportunity to compete in the market. Access pricing, which allows new entrants and existing public utilities to compete on equal terms, is only one part of the solution for facilitating competition in the water industry. The WICA prescribed a number of principles for access pricing in which the price of access should the following:[15]

- Generate expected revenue that is at least sufficient to meet the efficient costs of providing access to the service, and include a ROI commensurate with the regulatory and commercial risks involved
- Allow multipart pricing and price discrimination when it aids efficiency
- Not allow a vertically integrated service provider to set terms and conditions that discriminate in favor of its downstream operations, except where the cost of providing access to other operators is higher
- Provide incentives to reduce costs or otherwise improve productivity

To retain the current postage stamp pricing arrangements for retail services, and provide a relatively simple and inexpensive approach to facilitating access, IPART recommended in

2005 that access to water and wastewater infrastructure be priced according to the Efficient Component Pricing Rule (ECPR) (IPART 2005a).

12.3.4. Privatization of the Sydney Desalination Plant

In 2011, the government decided to privatize the Sydney Desalination Plant (SDP). This provided an opportunity to promote competition by enabling SDP to sell to other suppliers. The key risks for potential buyers were the recovery of energy costs and the impact of the operating rules. Potential buyers needed certainty on the recovery of costs if not operating, and recovery of shutdown and start-up costs. This would have been more accurate through the contract with SWC, but the government asked IPART to set the price. IPART's Terms of Reference for the review of the price required it to ensure that the SDP was indifferent to whether it operated or not (if it is available). This was controversial, but reasonable and sensible. It reflected the contractual basis for similar privately owned facilities, such as the power purchase agreements for independent power producers. It meant that the SDP did not bear climate risk or the risks of changes to the rules established by the government for when it should operate.

IPART undertook its standard building block cost analysis to set the Annual Revenue Requirement (ARR). Setting the regulatory asset base (RAB) was not controversial, since IPART used actual cost rolled forward. With the exception of electricity costs, operating expenditures (OPEX) were also not controversial.

Benchmarking of existing electricity contract costs led to a small reduction in costs. This left the SDP subject to benchmarking risks in future. Initially the decision also left the SDP fully exposed to price risk when reselling electricity back to the market in periods of shutdown. This was unsustainable, since it exposed investors to too great a risk so, in accord with the terms of reference for the SDP price review issued to IPART by the New South Wales government, IPART added a mechanism to carry-forward 90 percent of gains and losses in excess of 5 percent of energy contract values to the next determination. The calculation of the WACC was also controversial. Declining interest rates had reduced the WACC relative to normal long-term levels and investor expectations. IPART set the WACC at 6.7 percent (real pretax), which was near top of range and closer to long-term averages. The WACC and risk allocation was acceptable but not overly generous for bidders. The SDP was sold for $A 2.3 billion, which, at 1.15 times the RAB, was consistent with other successful privatizations.[16] Following the sale, SWC retired $A 1.8 billion in debt[17] and made a special dividend to government of $A 126 million (SWC 2013).

Notes

1. NCC, Services Sydney Application for Declaration, available on NCC website.
2. NCC, Recommendations and Final Decision.
3. Trade Practices Act 1974, part IIIA.
4. See WICA's website, www.legislation.nsw.gov.au.

5. Hansard, Water Industry Competition Bill, Second Reading Speech.
6. WICA 2006, section 41(2).
7. WICA 2006, section 41(3).
8. Metropolitan Water Directorate, Urban Water Regulation Review, Position Paper.
9. See Metropolitan Water Directorate's website "WIC Amendment Act"
10. See IPART's website "WIC Act"
11. Combined with the government's 2008 decision to set water and sewerage developer charges to zero in Sydney and the Hunter. That is, the absence of cost-reflective developer charges, combined with postage stamp pricing, can act as an impediment to competition—particularly in high cost areas.
12. IPART argued that SOCs should not be advantaged or disadvantaged by virtue of their state ownership (i.e., they should not have additional requirements imposed, or additional privileges granted). See IPART 2014.
13. SWC's current (2015) operating license phases out prescriptive water conservation targets and replaces them with the concept of an "Economic Level of Water Conservation."
14. WICA 2006, section 41(3).
15. WICA 2006, section 41(2).
16. SDP website.
17. New South Wales Audit Office, Vol 6. 2012, Water Overview.

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WICA (Water Industry Competition Act). 2006. "Water Industry Competition Act."

Chapter 13 Water Scarcity and the Construction of the Sydney Desalination Plant

Australia's relatively low rainfall and prolonged periods of drought create concerns that major urban areas may face water shortages. During the Millennium Drought of the early 2000s, storage levels in Sydney fell to below 40 percent.

The major reform in water security came through the construction of the Sydney Desalination Plant (SDP) in 2010 as an insurance scheme to provide additional water when dam levels fall below designated levels during extended droughts.[1] This has substantially reduced the risk of severe water scarcity and provides a potential source of bulk water for new retailers. It also directly and indirectly increased the private participation in the sector and the scope for competition. The SDP was subsequently privatized, with the option of supplying water to bulk customers other than the Sydney Water Corporation (SWC). The easing of water scarcity risks indirectly led to the review and proposed removal[2] of the requirement in the Water Industry Competition Act (WICA)[3] for new entrants to source their water from new additional sources (Metropolitan Water Directorate 2014).

This section discusses the water scarcity issue and the government's response, which ultimately led to the construction of the SDP. Other states, such as Western Australia and Victoria, also built desalination plants in this period, and the decision to commit to desalination options are compared. It also considers alternatives such as scarcity pricing. The increased role for the private sector is discussed in the next section.

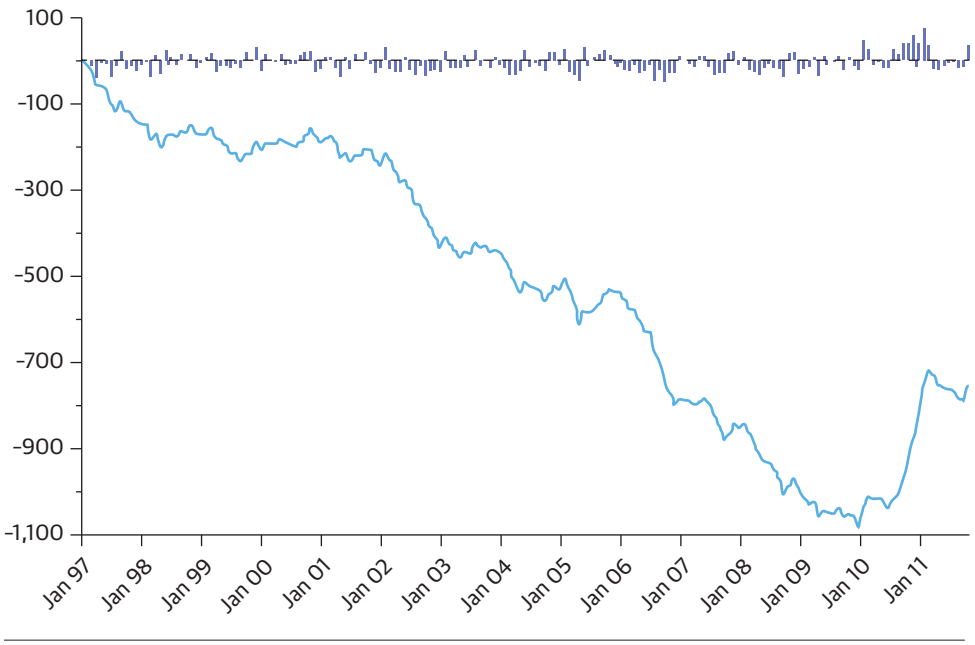
13.1. Water and Scarcity

Average water consumption in Australia is among the highest in the world, with total consumption growing, while rainfall is relatively low and variable. In periods of drought, water levels fall and the probability of water shortages rises, thus the scarcity value of water increases. Periodic droughts are a feature of Sydney's climate and have helped to shape the current water supply system. Over the past 130 years, Sydney has experienced three severe droughts: in the 1890s, the 1940s, and the early 2000s. The most recent drought has been referred to as the Millennium Drought and lasted from late 1996 to mid-2010 (see figure 13.1).[4]

Despite large water storages, water security remains vulnerable. The water storages that provide water to Sydney are 2,581,749 ML.[5] At an average annual consumption of 515,834 ML (SWC 2015), Sydney could survive only five years without rain. Sydney has experienced significant droughts in recent years that have put stress on the supply system, resulting in increasingly tight restrictions on water use.

Setting usage charges at Long-run marginal cost (LRMC) provides the right long-term signal, but not necessarily the best short-term signal. Possible responses to the threat of water scarcity due to droughts include one or more of the following: usage restrictions and

FIGURE 13.1. East Coast Millennium Drought: Cumulative Variation in Rainfall from Long-Term Average (mm)



Source: Climate Council 2015.
Note: Bars show variation in rainfall from the long-term average in each month. Line graph shows the cumulative variation over the period.

regulations on water efficiency, scarcity pricing, and additional diversified supply sources (such as desalination plants).

13.1.1. Usage Restrictions and Regulations on Water Efficiency

In the past, governments have relied upon water restrictions (e.g., strict limits on outside use of water) in times of scarcity. Historically, New South Wales has used a tiered system, with more onerous restrictions implemented as dam levels progressively fall below specified levels. As shown in table 13.1, there were three tiers under this approach, with restrictions becoming harsher with each new tier.

TABLE 13.1. Water Usage Restrictions

Restriction level	Level 1	Level 2	Level 3
From	Oct 1, 2003	June 1, 2004	June 1, 2005
To	May 31, 2004	May 31, 2005	June 30, 2006 (level 3 restrictions remained in force until restrictions were replaced by Water Wise Rules in 2009)
Storage levels	Combined dam storages fell to 55%	Combined dam storages fell to 50%	Combined dam storages fell to 40%
Restrictions	No hosing of hard surfaces No sprinklers or watering systems	Plus Lawns and gardens can only be watered before 9am and after 5pm Wed, Fri, Sun using hand-held hoses No filling of new or renovated pools over 10,000L without permit	Plus No hoses or taps to be left running unattended except when filling pools or containers Fire hoses used only for firefighting purposes – not for cleaning Fines for businesses increased from $A 220 to $A 550
Estimated savings from restrictions	49,011 ML	100,318 ML	113,839 ML
Savings (%)	13	16	17

Source: Institute for Sustainable Futures and ACIL Tasman Pty Ltd; SWC.
Note: Voluntary restrictions were introduced on November 15, 2002.

Under this system, SWC estimated that they had saved approximately 15 percent of previous demand levels (SWC 2009).

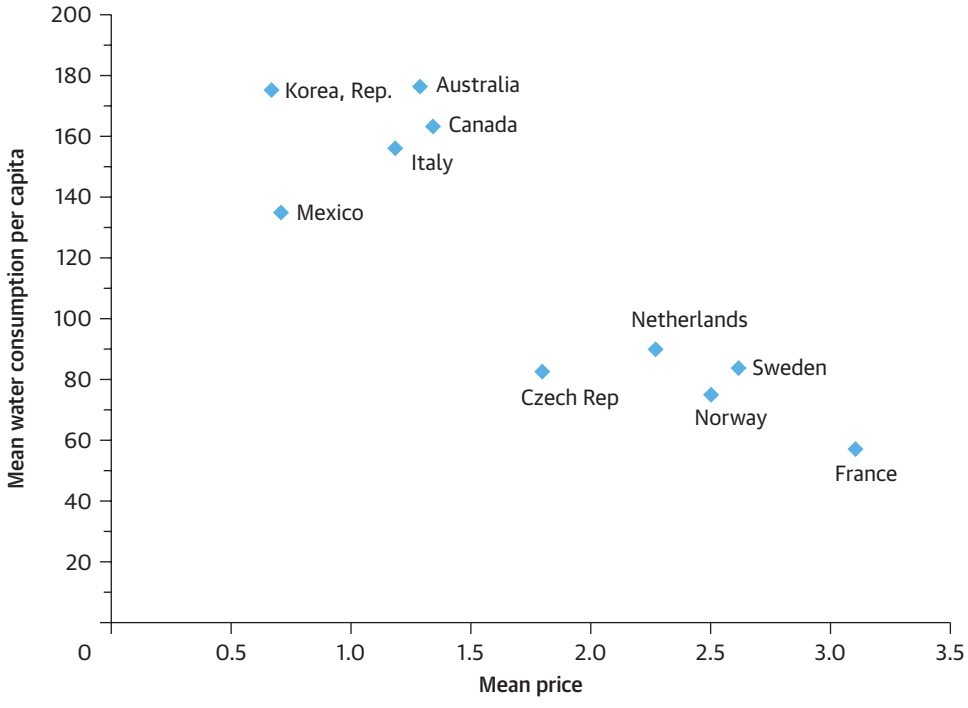
While restrictions are well accepted and effective,[6] economists argue they impose large welfare losses[7] (estimated at around $A 900 million per annum for Australia) and are inferior to scarcity pricing, where usage prices rise as water levels fall. Duke and Ehemann state:

> Although mandatory restrictions and rationing are widely used to conserve water during droughts, only pricing efficiently signals water scarcity. The importance of conservation is not clearly conveyed with restrictions and rationing because the price of water remains artificially low. Conservation pricing, however, is flexible. Droughts can end abruptly and so can the price premium. Conservation pricing also provides a clear incentive to consumers, which rewards those who conserve, but which also allows people to use nonessential water as long as they are willing to pay for it. (Duke and Ehemann 2002, 2)

13.1.2. Scarcity Pricing

In principle, the price of water should be the greater of the cost to produce the water or its scarcity value. The scarcity value is the cost consequence of a shortage of water times the probability of shortage. As water storage levels fall, the probability of water becoming scarce rises; hence the price of water should rise as dam levels fall. Grafton and Kompas (2007) argue that equity issues associated with high usage charges could be addressed by providing relief through the fixed charge. Alternatively, households could be provided with a basic entitlement of water that would be charged at a lower price above which scarcity pricing takes over.

FIGURE 13.2. Prices and Demand – International Comparison



Source: Grafton et al. 2011.

Figure 13.2 illustrates that as the price of water increases, water consumption decreases, implying that scarcity pricing could be effective in reducing water consumption. Despite this, regulators have not embraced scarcity pricing. Regulators seem to be reluctant to endorse scarcity pricing because (a) regulators are concerned about what happens to the surplus revenue; (b) regulators

are skeptical about the short-term demand response; (c) customers prefer water restrictions over scarcity prices; and (d) questions over whether water scarcity is a problem given the desalination plant is available but not being used. It is also worth noting that, in the absence of tradable water entitlements or setting a price to achieve a given outcome, any scarcity price would be administratively set (i.e., not set by the market), which undermines the benefit and rationale of scarcity pricing.

The problem of what happens to surplus revenue can be resolved. WaterNSW,[8] the main bulk water supplier to SWC, proposed an approach that would address these concerns: WaterNSW would sell water to SWC on a two-part rate, a fixed plus a variable charge, with the variable charge set at their small marginal operating cost. An additional variable scarcity premium would be triggered when dam levels fall below a predetermined level. Furthermore, the funds from this scarcity premium would not be retained by WaterNSW. Instead, the funds could be transferred to the government to fund water efficiency programs or transferred to SWC to offset the effects on customers' prices while retaining the price signal on the value of water.

IPART did not accept this proposal, due to concerns about customer acceptance of scarcity prices and if demand would respond in the short term (IPART 2008). The decision to build the SDP further reduced the need for scarcity pricing by reducing the risk of severe water shortages. As a result of IPART's 2016 determination of SWC's prices, its prices to end-use customers will increase when SDP is "on" (and hence will vary to some extent with dam levels and scarcity) (IPART 2016b).

13.1.3. Decision to Build the Sydney Desalination Plant

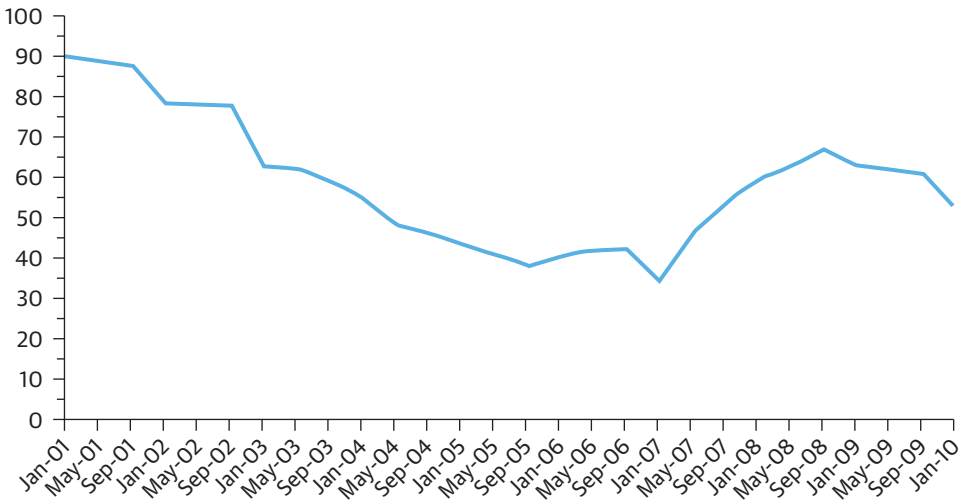
In the early 2000s, the South East of Australia experienced a long period of drought. Even though Australian cities relied on large dams for their water supply, this long drought meant that water suppliers still struggled to meet the demand for water. As a result, most of the major urban cities in Australia committed to desalination plants to supplement water supply. In 2005-06 the New South Wales government reviewed Sydney's water supply (Institute for Sustainable Futures 2006). The underlying demand for water was rising. Droughts were growing longer and rainfall was more variable and lower than the long-term average. This was consistent with the expected outcomes of climate change. Hence, security of supply was falling and extra capacity was needed. The review recommended a desalination plant as part of a diversified approach to supplying water to Sydney. The review recognized that Sydney dam levels were down to 40 percent to 45 percent for much of 2005-06. However, no commitment should be made to constructing a desalination plant until storage levels fell to 30 percent.

Figure 13.3 shows the dam storage levels from 2001 to 2010. In November 2006, water storage fell to 38 percent of capacity. Although this was historically low, it was still above the specified trigger point of 30 percent. However, at this point the government directed SWC to build the SDP. Construction began in 2007 and SDP's first drinking water was delivered in

February 2010 (see Box 13.1).[9] The SDP was a response to long-term trends and immediate water security risks: an insurance policy for water security, intended to be used occasionally.[10] Ironically, once the commitment to this large and somewhat inflexible insurance policy was made, the rains came and dam levels rose to over 50 percent.

Although initially owned by SWC, the SDP contracted Veolia to operate and maintain the plant. In 2012, the SDP was privatized under a 50-year lease on the plant backed by a 50-year water supply contract with SWC for $A 2.3 million. The SDP operates only when water levels in Sydney's dams fall below 70 percent. Under the operating rules, the SDP will commence full operation when dam levels fall below 70 percent, and this will continue until dam levels reach 80 percent. In addition, there are five modes of operation, depending on the minimum expected period of operating: (a) full operation when the plant is producing water, (b) short-term shutdown for 2-10 days, (c) medium-term shutdown for 11-90 days, (d) long-term shutdown for 91 days to two years, and (e) water

FIGURE 13.3. Sydney's Total Dam Storage Levels, 2001 to 2010



Source: Metropolitan Water Directorate. Metropolitan Water Plan 2010, ch 3, p23.

BOX 13.1. Sydney Desalination Plant

Production capacity: 250 ML of drinking water (around 15 percent of Sydney's water needs)

Potential capacity: 500 M

30-year supply contract with SWC

Capital cost: $A 1.8 billion.

Variable costs when operating: around $A 0.60 per thousand liters of water produced.

Electricity is the largest operating cost. SWC entered into long-term supply contracts to meet the plant's energy needs when operating. The government required SWC to contract with renewable energy. When not operating, the contracted energy is sold back into the energy market.

Source: IPART 2011a.

security shutdown for more than two years (IPART 2011b). The plant has been in full water security shutdown since the end of the testing period in 2012.[11]

13.1.4. Comparison with Perth and Melbourne

The decision to build a desalination plant contrasts with the approaches adopted in Perth and Melbourne; arguably, it falls between the two in terms of cost to the community and value as a water security insurance policy. Perth delivered two smaller scale plants on time and on budget, while a plan for desalination in Melbourne was developed within four months and led to issues. Porter (2013) identified three related factors in the two experiences: the approach to planning, institutional structures, and political involvement.[12]

Plans for desalination in Perth commenced in 1999. Originally it was intended to be built as a contingency option if inflows were low enough to trigger an emergency drought response. The Water Corporation of Western Australia developed a plan for desalination employing trigger points and contingency planning for both the scale and timing of the implementation of desalination. In Western Australia, there was strong evidence of trending decline in inflows. On the other hand, Porter (2013) argues that inflows in Melbourne appeared to be random, yet Melbourne responded to declining storage levels before there was adequate evidence of a long-term decline in resources. The Melbourne plan to build the desalination plant was developed quickly over four to six months. This resulted in inaccurate cost estimates, lengthy delays, and significant budget overruns.

The Water Corporation's approach, based on trigger points and contingency planning, gave it time to adjust the plan prior to construction and as further flow information became available. As a result, the plant was increased from 30 GL to 45 GL. This approach also meant that planners were not responding to record low inflows until more information on the continuity of those inflows was available.

The Water Corporation in Perth is a vertically integrated utility, while the water utilities in Melbourne comprise Melbourne Water and three disaggregated businesses. Porter (2013) argues that the vertical integration in Western Australia made water planning easier. In contrast, the disaggregation in Victoria meant that no single organization took responsibility for water planning. This created an opportunity for greater trading of water across different sources to optimize usage, however this opportunity was not tapped.

The varied structure of the industry also led to differences in political involvement in water planning. Under the delegated planning framework in Perth, Water Corporation initiated plans for desalination with advice and briefings to the premiers. Whether it be the structure or level of confidence in the agency undertaking the planning, there was less political involvement in the decision making in Western Australia. Triggers were established through the planning process, and decisions reflected these triggers. In contrast, there was a high degree of political involvement in Melbourne, at all stages of the planning process.

The experience in New South Wales shares some aspects of both the Perth and Melbourne experiences. SWC was not vertically integrated, with the bulk water supply separated,

but the Water Directorate was responsible for planning. The planning process was more extensive than in Melbourne and resulted in clear trigger points for decisions, as in the Western Australia planning process. However, in the face of declining dam levels, Cabinet committed to the SDP prior to the trigger points being reached.

13.1.5. Implications for Prices

The SDP had important implications for prices: (a) average prices increased to cover the costs of the plant; (b) use of scarcity pricing was diluted, but prices now vary to a small degree with dam levels; and (c) the long-run marginal cost (LRMC), used to set the usage charge for water, has been reduced, raising questions as to whether long-term rising usage charges should be reversed. The SDP has different costs to water provided to SWC by WaterNSW. Unless catered for in SWC's water prices, this can have an effect on SWC's profitability.

In normal circumstances, the question of whether to pass through the costs of the SDP into prices would have been a difficult one for Independent Pricing and Regulatory Tribunal (IPART). It would have had to consider whether the decision to commit to the plant was best given the information available. Commitment to the SDP was a controversial decision, and for many people the near-immediate and enduring increase in dam levels was evidence of a flawed decision. However, the regulator cannot use hindsight; at the time of the decision there were genuine concerns about the security of supply. The other complicating factor for IPART was that the New South Wales government controlled the decision to invest, rather than SWC. The regulator cannot hold the utility accountable for a decision made by another party.

However, IPART was spared from these issues, and the public was not able to examine the merits of the decision through the price review process. In June 2007, the New South Wales premier and minister requested IPART to reopen the existing price path to include the efficient costs of the SDP and recycling schemes. The New South Wales premier used his powers under section 16 of the IPART Act to direct IPART that it could test the efficiency of costs in the review, but not examine the decision to invest nor the timing and scale of the desalination plant.

IPART revised the building block analysis, adding in the cost of the plant and updating parameters such as weighted average cost of capital (WACC) and demand forecasts. IPART engaged Halcrow to review the efficiency of costs, and subsequently assessed the costs associated with the SDP plant as efficient (IPART 2008). Initially, IPART did not establish a separate price for SDP. Instead it rolled the costs into general water service costs, recovered by a higher usage charge. As a result, the average residential bill increased by $A 275 (more than 33 percent) over the four years to 2011-12, with $A 118 attributed to the SDP (IPART 2008). Since 2012, SDP prices have been separate.

The SDP has not eliminated the risk of water shortages or the need for restrictions, but it has reduced the probability of these events and, in particular, the probability of high levels of restrictions with higher welfare losses. This reduces the benefits and the extent of scarcity pricing. Furthermore, the structure of prices for the SDP (a fixed charge and a variable charge,

where the variable charge is higher when the plant is operating) means that the cost of bulk water is higher for SWC when the SDP is operating. Initially this variation was not reflected in usage charges for end-consumers, but IPART's 2016 determination provides for usage charges to vary depending on dam levels and the operational status of the SDP. IPART allowed the pass through of variable costs of $A 0.12 per kiloliter (in 2015-16 dollars) if the SDP is operating. IPART estimated this would add an additional $A 26.40 to a typical annual residential bill.

With the construction of the SDP, the estimated LRMC of water supply has fallen, as is common in infrastructures with irregular large capacity increments. Construction of the SDP was the next step in capacity required, projected to be required in the near term. The next increment of capacity required is the expansion of the SDP further into the future. Hence, the cost today is lower. This is one of the factors resulting in the lower estimate of the LRMC in the 2016 determination. The range for IPART's estimates of the LRMC was $A 1.11 per kL to $A 1.62 per kL Prior to the SDP build, the midpoint estimate LRMC was around $A 1.90 per kL (2007-08 dollars).

The lower estimates of the LRMC resulted in some tension between the preferences of consumers to pay a larger proportion of their bill through usage charges (rather than fixed charges) and the strict application of the LRMC pricing rule. In its 2016 determination, IPART chose to reduce the usage charge by a smaller amount (from $A 2.28 per kL to $A 1.97 per kL) after considering both the preferences of consumers and the uncertainty in the LRMC estimate.

13.1.6. Lessons for the Future

It is widely recognized that water security is critically important, particularly for large modern cities. One of the lessons from Sydney and Melbourne is that political decision makers are less willing to take risks on water security during severe water shortages than assumed in the models of economists or planners. Rational planning rules can be established but these do not appear to meet the political concerns for absolute water security.

Reflecting this, the economic merits of the decision to invest in the desalination plants are questionable. The indicative figures suggest that, looking across Australia, the total cost of desalination exceeds that of the previous restriction's approach. At the time, decisions were made to also build desalination plants in Queensland and Adelaide. The total investment in the desalination plants was $A 10 billion (Porter 2013). Assuming a 6 percent real rate of return (ROR) and 40-year life, the capital costs alone are $A 850 million dollars. This excludes the operating and maintenance costs, costs of electricity when the plants are running, costs of periodic replacement of membranes, and costs of shutting down and starting up the plants. By comparison, the welfare costs of water restrictions had previously been estimated at $A 900 million per annum across Australia. Furthermore, although desalination plants reduce the likelihood and severity of water restrictions, they do not avoid the need for restrictions entirely.

One of the key arguments against scarcity pricing is that the community would find it controversial and would not accept it. However, the impact of the desalination plants on

prices has also been controversial, considering consumers are paying the costs of these plants in a long-term shutdown. The analogy of the plants as insurance policies has not been well communicated to nor accepted by the community.

Notes

1. Construction of the SDP commenced in 2007 and finished in 2010. SDP's first drinking water was delivered in February 2010. (See Sydney Desalination Plant's website at http://www.sydneydesal.com.au/who-we-are/our-history/)
2. The government has passed but not commenced amendments to the WICA. Under these amendments, the requirement to source sufficient quantities of water other than from a public water utility has been removed.
3. WICA 2006, section 10(4)(d).
4. Bureau of Meteorology website, "Southern Rainfall Decline."
5. WaterNSW website.
6. The IPART report on scarcity pricing notes that around 80 percent of respondents surveyed supported the existing restrictions.
7. Economists argue that water restrictions are economically inefficient, because water is not allocated on the basis of marginal willingness to pay. This means that there are some high value uses of water that are unrealized with mandatory restrictions.
8. Formerly the Sydney Catchment Authority.
9. SDP Pty. Ltd. website. http://www.sydneydesal.com.au/who-we-are/our-history/.
10. New South Wales Government, 2006 Metropolitan Water Plan, Sydney.
11. SDP Pty. Ltd. website "Our History," http://www.sydneydesal.com.au/who-we-are/.
12. This section draws substantially on Porter (2013).

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Chapter 14 Approach to Price Regulation and Licensing

The Government Pricing Tribunal (GPT) (now Independent Pricing and Regulatory Tribunal [IPART]) was established in New South Wales in 1992 to remove politics from pricing electricity, water, and transport services provided by the government's businesses, and to reinforce the strategy of commercialization and corporatization directed at improving these businesses' efficiency. Independent economic regulation of utilities subsequently became a key part of Australia's pro-competition microeconomic reform program following the Hilmer Report (National Competition Policy Review 1993).[1] This led to the strengthened role of the ACCC as the national regulator, the establishment of similar bodies in other states, and the establishment of a separate national energy regulator, the Australian Energy Regulator (AER). IPART's role became both broader and narrower; broader in that it covered privately owned businesses as well as government-owned businesses, and narrower in that a key objective was to increase competition and narrow the scope of the core regulated monopoly facilities. This section discusses the development of the economic regulation of the water sector in New South Wales.

14.1. Establishment of Independent Price Regulation

14.1.1. Why Establish Independent Regulation of Government Businesses?

Almost 25 years ago, the New South Wales government established the first independent economic price regulator in Australia. Perhaps the boldness of that step is not fully appreciated. IPART was established prior to the Council of Australian Governments (COAG) Water Reforms and the Hilmer Report, with their recommendations for the establishment of independent price regulation. Importantly, IPART's focus was on the regulation of prices of government businesses, which contrasts with the regulatory environment overseas at that time. For example, the United States had a long history of regulation of privately owned utilities while Chile and the United Kingdom separately established independent utility regulatory bodies as they privatized their utilities. In these cases, taking ministers out of price setting was considered necessary for establishing investor confidence.

The New South Wales government did not link independent price setting to privatization. Rather, it sought to remove the abuse of monopoly power and provide incentives for price reform and efficiency.[2] In effect, the government was saying:

> We (the government) have previously set utility prices and the outcomes have been poor. Prices have been highly politicised and under-recovered costs, and the businesses have not performed well. We need to take the politicians out of the price setting process and entrust the function to an independent agency operating transparently. Our role is to set the broad objectives that this regulator must consider. (Cox 2012, 1)

Independent regulation supported the commercialization and corporatization policies aimed at improving the performance of the government's businesses. By determining prices

independently, the regulator would set a hard budget constraint within which the utility would have to operate. Furthermore, the utility would keep the benefits of exceeding the estimated efficiency savings (at least until paid to the government in increased dividends) or bear the losses if it fell short.

Subsequent to IPART's establishment, some form of independent economic regulation of government utilities has become the norm in Australia, although the roles and powers vary between sectors (Frontier Economics 2014). Regulators in the energy sector have had stronger determinative powers, while the extent of regulation in the transport sector is mixed (e.g., airports are subject to price monitoring only). While regulation of access to rail lines and ports for commercial transport is common, independent regulation of public transport is less common. In the urban water sector, all states other than Queensland[3] have some form of price regulation for urban water. The jurisdictional regulators in Victoria (Essential Services Commission [ESC]) and New South Wales (IPART) have strong determinative powers. However, the regulator in Western Australia has merely an advisory role in water. This is an area where there is scope for improvement.

Independent regulation of government monopolies has also become far more common overseas, often with the encouragement of international development agencies such as the World Bank. One of the expected benefits of this independent regulation is that it is more likely to result in pricing decisions that are evidence-based, are consistent through time, and promote economically efficient delivery and use of utility services. The community's expectations of price regulators can be expressed in simpler, but more demanding terms: fair and balanced decisions.

Price Reform Priorities in Water

Prior to IPART's establishment, water pricing had largely been based on property taxes, with a free water allowance after which the customer paid a relatively small usage charge. It was inefficient from a resource allocation perspective, as customers were not given the incentive to manage their water usage. Although HWC introduced usage pricing in the mid-1980s, this form of pricing had not been introduced for SWC. Indeed, SWC was a key supporter of the establishment of IPART because it had been unsuccessful in past efforts to reform its water prices. Thus, among the problems that needed to be addressed were inefficient politicized price structures based on a property tax, and usage charges that were too low. As a result, small businesses were subsiding households and large businesses. An owner of a small shop in Sydney told the Tribunal that it would be "cheaper for me to buy champagne." In addition, there were low levels of cost recovery and inefficiency. SWC covered its operating costs but its profits were small. But SWC's costs were suspected to be higher than necessary. Finally, no signals of the regional differences in costs, resulting in cross-subsidies between regions and cross-subsidies from existing customers to new customers.

The context for SWC's problems was a governance framework that was improving but still weak. SWC was more commercial than it had been (e.g., reporting returns and paying dividends),

but it was not yet corporatized with clear commercial objectives. Hence, its efficiency incentives were still weak. Furthermore, the licensing and service standards were not formalized and the environmental regulatory framework was uncertain.

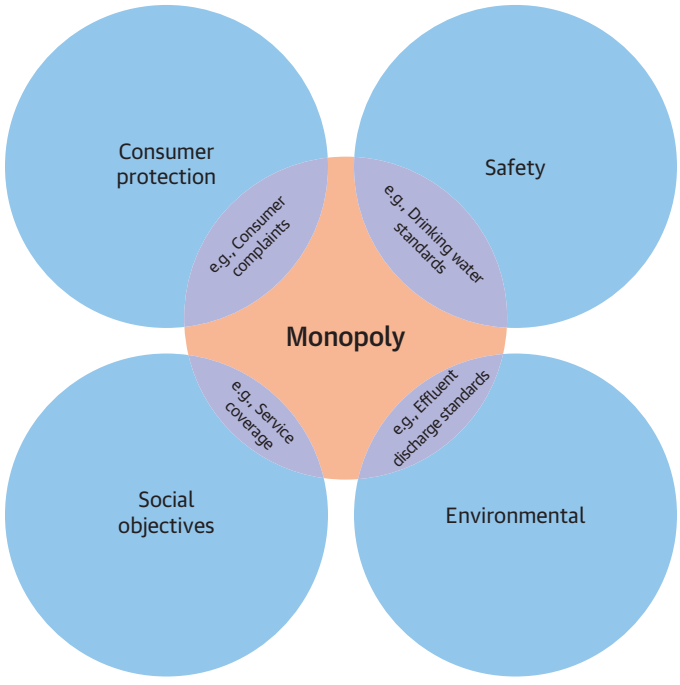
14.2. IPART's Powers and Independence

IPART is established under its own act, the Independent Pricing and Regulatory Act 1992, which replaced the earlier Government Pricing Tribunal Act 1992. Tribunal members are appointed for fixed five-year terms and appointments can be renewed, but tribunal members cannot be dismissed except in extraordinary circumstances such as a criminal conviction. IPART's employees are employed under the IPART Act with terms and conditions comparable to the New South Wales Public Service.

IPART has a standing responsibility for the regulation of the prices of the major urban water suppliers, transport service providers, and retail gas suppliers. It is also the license administrator for the water sector and electricity networks. In addition to these utility regulation functions, it sets local government rates, administers an energy efficiency scheme, and undertakes other reviews as requested by the government.

IPART's role in the economic regulation of water is well-defined and relatively narrow. As shown in figure 14.1, it is largely constrained to the regulation of prices for monopoly water and sanitation services. While IPART monitors license compliance and advises on license conditions, it does not set drinking water standards, environmental standards, or social tariffs, or handle consumer complaints.

FIGURE 14.1. Defining Water Sector Economic Regulation



Source: Ehrhardt et al. 2007.

IPART does set maximum prices. The government-owned utilities can charge less than the maximum price but if so "the Tribunal is required to assess and report on the likely annual cost to the Consolidated Fund if the price were not increased to the maximum permitted."[4] Furthermore, the treasurer's approval is also required if prices are to be set below the permitted maximum.[5] These are important provisions reflecting the original objective of reducing the political intervention in pricing that previously resulted in prices that were too low. In setting prices, IPART is required to consider factors covering economic efficiency, commercial sustainability, consumer protection, and environmental impacts. This introduces significant discretion, but there is no way to appeal against IPART decisions on the grounds of merit. Appeals can be made to the Supreme Court of New South Wales on administrative law grounds.

The issue of independence is often a sensitive one and a matter of degree rather than absolutes. The community

sees water services as having a public purpose, and the pricing of an essential service, such as water, raises sensitivities that the prices of other commodities do not. Inevitably, such concerns raise social or political issues (in a longer term, nonparty-political sense) that the regulators and regulatory institutions must take into account. As Ehrhardt and colleagues argue (2007), the challenge is not to exclude politics completely but to create protections against time-inconsistent interventions and politicization of decision making, while providing a safety valve for transparent interventions in extreme circumstances.

Under the IPART Act, the government can provide directions that IPART must consider. Most commonly, it has used this power in directing a utility to undertake certain activities for policy purposes (as provided for under the State Owned Corporations Act), which requires as a matter of policy that the costs of these activities are paid for by consumers. The desalination plant was an example of this. Except for such written directions, the government may provide submissions to IPART reviews but cannot direct its approach to tasks or its decisions

IPART's legislation requires it to adopt accessible and transparent processes. IPART is required to act with as little formality as possible, and the minimum requirement for each review is that IPART must (a) provide public notice of the inquiry and its processes; (b) call for submissions and publish submissions received (subject to consideration of confidentiality claims); and (c) hold public hearings. IPART has broad information gathering powers, and may require utilities and others to provide information that IPART considers necessary for its investigations or to attend hearings.

14.3. Objectives and Processes for Reviews

Section 15 of IPART Act sets out of a number of objectives that the tribunal must consider in determining prices (see box 14.1). The range of objectives was of concern to some stakeholders, such as the utilities, because of concerns it may dilute the focus on economic pricing objectives and allow the persistence of social pricing. Others, such as consumer and environmental groups, consider the breadth of objectives an important protection. In practice, the range of objectives reflected the range of perspectives at the political level, which resulted in the delegation of decision making to an independent body (IPART) with limited guidance.

There were differing views on whether and how a regulator can effectively limit its discretion by structuring and prioritizing objectives given to it by Parliament. One view is that the range of objectives creates an undesirable level of uncertainty, and that it is appropriate for the regulator to structure and limit its discretion by providing guidance on how it will interpret and prioritise these objectives. An alternative view is that such guidance cannot be binding, and that at each decision the tribunal must consider and evaluate decisions against all the objectives of the review. According to this view, if Parliament has given the regulator a set of objectives and discretionary powers it is inappropriate for the regulator to try to limit or preempt how it may exercise its powers.

From 2007, IPART issued a range of papers that explained how it would consider these objectives in its decision-making. The papers covered affordability and equity objectives

BOX 14.1. Pricing Objectives in IPART's Act

In making determinations and recommendations, the Tribunal is to have regard to the following:

a) the cost of providing the services concerned,

b) the protection of consumers from abuses of monopoly power in terms of prices, pricing policies and standard of services,

c) the appropriate rate of return on public sector assets, including appropriate payment of dividends to the government for the benefit of the people of New South Wales,

d) the effect on general price inflation over the medium term,

e) the need for greater efficiency in the supply of services so as to reduce costs for the benefit of consumers and taxpayers,

f) the need to maintain ecologically sustainable development (within the scope of section 6 of the *Protection of the Environment Administration Act 1991*) via appropriate pricing policies that account for all the feasible options available to protect the environment,

g) the impact on pricing policies of borrowing, capital and dividend requirements of the government agency concerned and, in particular, the impact of any need to renew or increase relevant assets,

h) the impact on pricing policies of any arrangements that the government agency concerned has entered into for the exercise of its functions by some other person or body,

i) the need to promote competition in the supply of the services concerned,

j) considerations of demand management (including levels of demand) and least-cost planning,

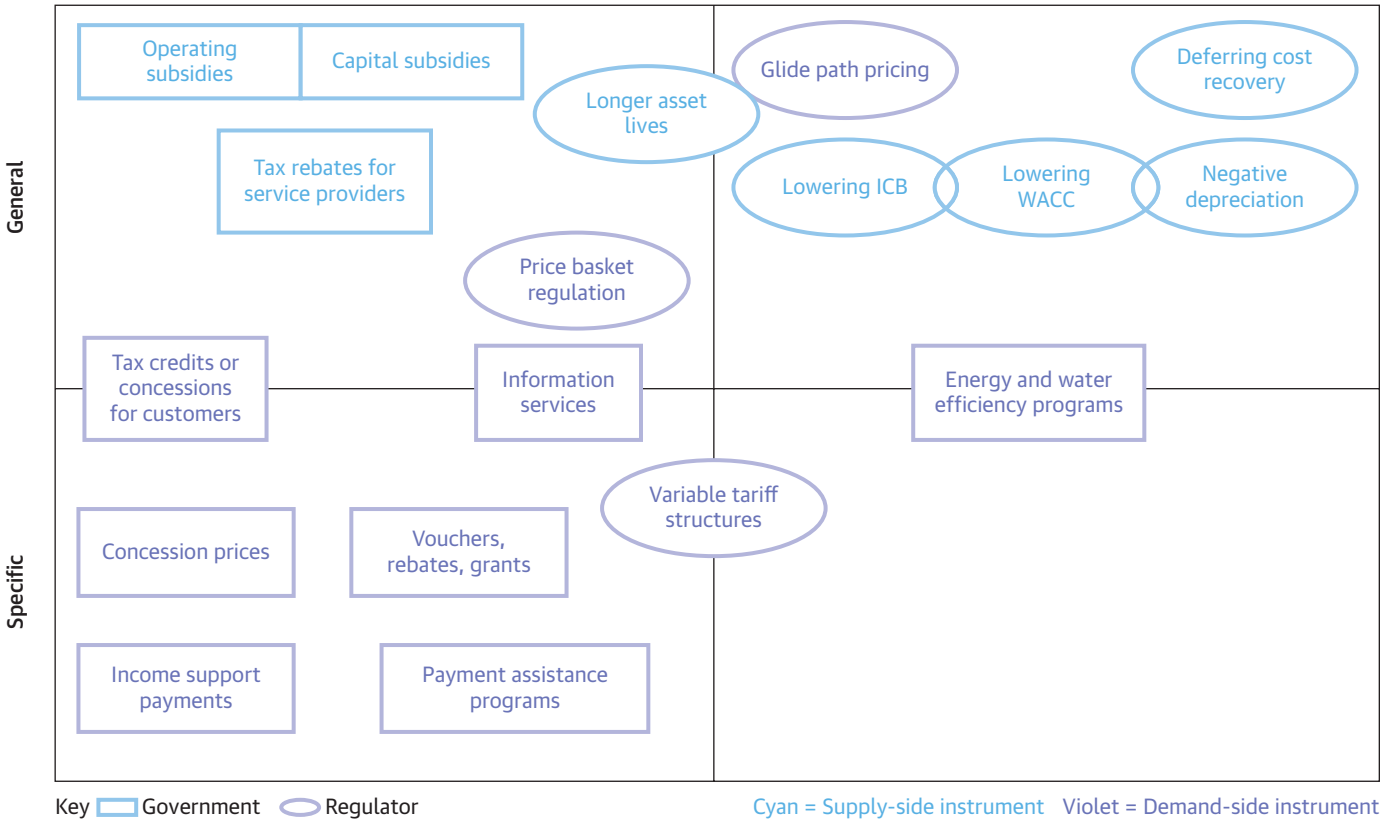
k) the social impact of the determinations and recommendations,

l) standards of quality, reliability and safety of the services concerned (whether those standards are specified by legislation, agreement or otherwise [Independent Pricing and Regulatory Tribunal Act 1992, section 15]).

(IPART 2010a), environmental objectives (IPART 2011a), and financability (IPART 2011b). Key points from these papers:

- Pricing decisions are not the only (nor necessarily the best) means of managing social impacts and ensuring affordable supplies. These goals may be better achieved through government policies, such as rebates or direct financial assistance (see figure 14.2).
- Transition paths for prices or alternative depreciation profiles may be an effective means of addressing price shocks or recovery of costs of additional capacity provided for future customers.

FIGURE 14.2. Affordability Instruments



Source: IPART 2010a.

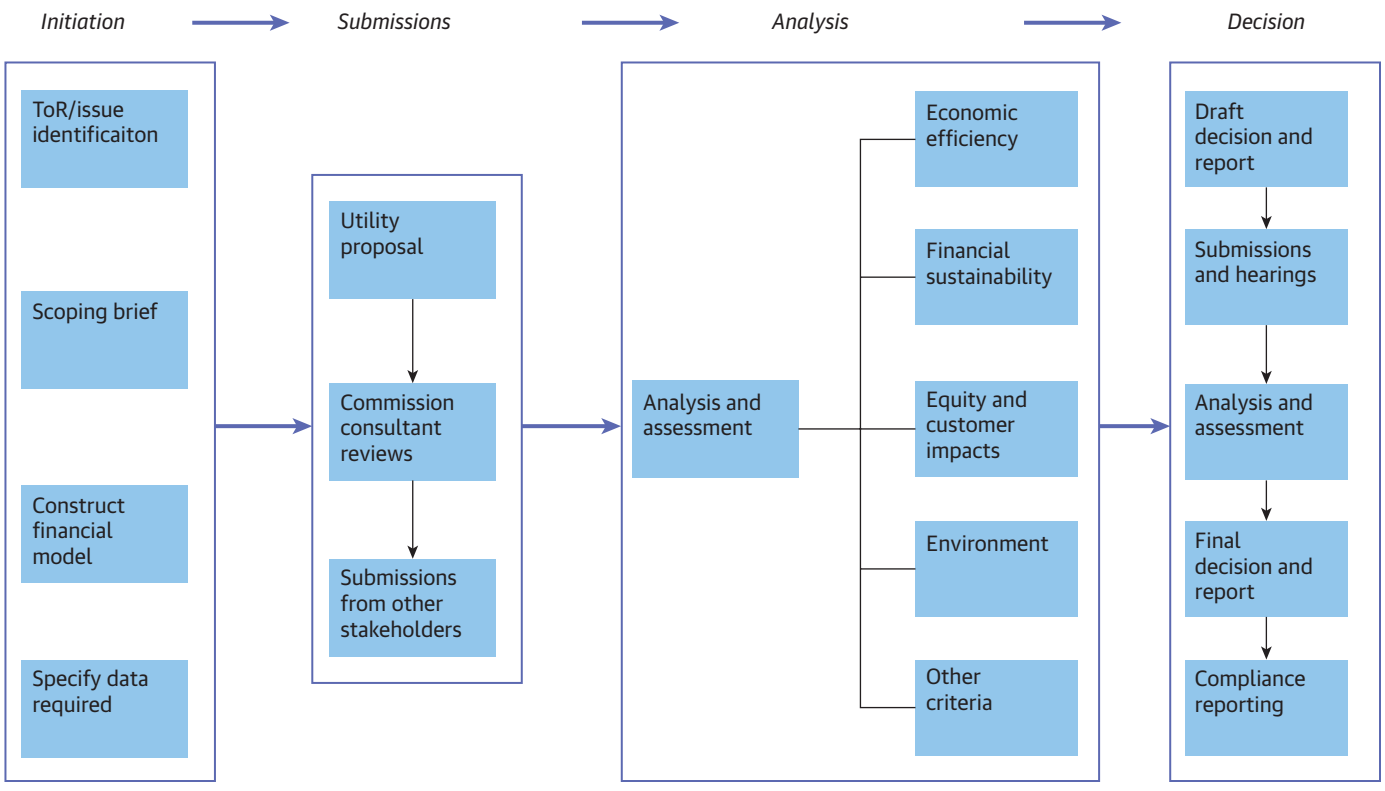
- Ongoing subsidies for particular consumers or for public goods are best handled through transparent government-funded subsidies rather than pricing cross-subsidies.
- Where possible, affordability goals should not be pursued at the expense of the commercial interests of the service providers.
- Environmental instruments implemented by environment regulators are the best means of achieving environmental objectives.
- IPART's primary role in promoting environmental objectives is to provide for recovery of costs of meeting statutory environmental standards and to ensure the regulatory approach does not create any perverse incentives or obstacles to better environmental outcomes. IPART has, however, expressed concerns where it considers environmental standards and policies inappropriate, and in the last determination of water prices it foreshadowed that it may not pass through the costs of meeting excessive standards.
- Except in the case of public transport, IPART has not included the value of environmental externalities in prices.
- IPART proposes financability tests to cross-check the commercial sustainability of the price determinations, rather than as a means of determining prices. In testing financability,

IPART has used the same ratios as rating agencies and adopted the benchmarks for BBB/BBB+ ratings (i.e., investment grade securities).

- IPART expects that the building block approach to determining revenues will usually result in commercially sustainable prices. Any shortfall would be temporary, but IPART has indicated that it may adjust prices to preserve financability however any adjustment would be NPV-neutral (i.e., offset by lower prices in future periods).

Figure 14.3 summarizes the processes for IPART's reviews. The transparency of the process and the opportunities for public input are key elements. The role of the draft report is particularly significant in the absence of merit-based appeals. It provides a mechanism whereby IPART sets out its analysis and proposals, and the utilities and other stakeholders have the opportunity to challenge these decisions. The final report responds to submissions on the draft report, and allows for new information that may become available after the draft report to be included. Minimum requirements for transparency are set in IPART's legislation. In practice, IPART has gone beyond the minimum requirements for transparency. As Jim Cox, (former CEO and tribunal member) emphasized, "at its heart IPART is a transparency agency."

FIGURE 14.3. Typical Process for a Price Review



The proposed changes in price structures in early water reviews were highly controversial. Hence, IPART made considerable effort to engage with consumers through media releases, distribution of leaflets explaining issues in terms relevant to, and easily understood by, households and small business, and town hall-style meetings in various regional centers. Over time, IPART has increased its use of workshops and roundtables to complement the formal requirement for public hearings. It sought to make the public hearings less formal, more accessible, and more interactive. This reflects its desire to avoid legalistic processes and it has avoided the adoption of U.S.-style legal jargon and processes.

In its early determinations, stakeholders (particularly utilities) expressed concern that the cost and financial analyses underpinning IPART's determinations were not transparent enough. It was referred to as a black box approach. From the late 1990s, IPART's analytical approach became increasingly transparent. It adopted the building block approach to determination of the revenue requirement and published its financial model. Consultants were used to evaluate efficient costs and the terms of reference, and to draft reports of the consultants published for consultation. This increasingly transparent and certain approach to the setting of the weighted average cost of capital (WACC) was an important factor in Moody's decision to increase the rating for SWC in 2015 (Moody's 2015).

In 2011-12, IPART initiated a review of customer engagement and its role in regulation. The review outcomes not only recommended improvements in IPART's processes but also included stronger requirements on utilities to engage with customers in developing pricing and service proposals. This is reflected in the increased focus on customer engagement in submissions by Hunter Water Corporation (HWC) and Sydney Water Corporation (SWC) to the 2016 water price review, which proved to be influential in IPART's decision on water usage charges for SWC.

While most of IPART's engagement with stakeholders has occurred in the context of the price reviews, it has commissioned approximately triennial surveys of stakeholder perceptions of its performance. It has also held occasional forums with stakeholders outside price reviews, to discuss its review and research program and issues for forthcoming reviews.

14.4. Evolution in IPART's Approach to Regulating Prices

Regulation has evolved over time from a simple, broad approach to a more detailed and complex approach. Initially the priority was on removing cross-subsidies and encouraging efficient pricing. In the first two price reviews in 1992/3 and 1995/96, IPART assumed that relatively large reductions in costs and staff numbers of 20 percent to 25 percent could be achieved in each regulatory period. The judgement was based on relatively high-level analysis of indicators of relative costs, such as operating expenses (OPEX) to customers and employees per customer, which suggested that SWC was comparatively overstaffed and inefficient. SWC's management was largely able to achieve the assumed efficiency gains. Indeed, to some extent the assumption of large reductions in costs was self-fulfilling.

In negotiating reduced employee numbers and other costs with staff, SWC's management cited the reduction in revenues due to IPART's determinations due to the assumed reductions in costs. Together, the assumed efficiency gains and cash flow approach to determining revenue needs resulted in real price reductions, which facilitated the structural reform of tariffs in the first two determinations. It is easier to remove cross-subsidies if the average price is going down.

One example of increasing complexity is in the estimation of usage charges based on the long-run marginal cost (LRMC). The initial priority was to remove the tax component of charges and free-water allowance. In that context, refining the level of the usage charge based on LRMC estimates was of second-order importance. However, from its 2005 decision for SWC (IPART 2005b), IPART placed greater emphasis on estimates of the LRMC as the reference point for the usage charge, and over time the techniques for estimating the LRMC have become more sophisticated.[6]

WACC is another example of increasing complexity of analysis. Prior to 2000, IPART's focus had been on the cash requirements of the business and broad assessment of efficiency in setting prices. IPART's approach to calculating WACC was fairly simple. Post-2000, IPART placed a greater emphasis on commercial returns and investment incentives. The RAB was locked-in and rolled forward using a defined procedure. The annual revenue requirement was set using projected cost building blocks and IPART used more detailed efficiency review. Table 14.1 summarizes the key decision points in IPART's successive water determinations.

TABLE 14.1. Key Decision Points in IPART's Successive Water Determinations

Decision	Assumed efficiency improvement (real terms)		WACC	Pricing
	OPEX	CAPEX		
1993-94 to 1996-97	25% efficiency improvement over three years		Not specified; financial assessment based on cash flow and margins	Removed free water allowances, commenced phase out of tax component
1996-97 to 1999-2000	20% reduction over four years	20% below expenditure in previous four years	7% return on new investment. Return on existing assets not specified	Tax component phased out, water usage charge increased
2000-01 to 2002-03	23% reduction in operating costs (3% higher than proposed by SW)	17% below SWC's projected expenditure	6.3% (real pretax) 2.8% above real risk-free rate	Reduction in service charge, small real increase in water usage charge
2003-04 to 2004-05	Additional 1.2% reduction in total operating costs on top of SWC's forecast reduction of 2% per annum	3.6% below SWC's projected expenditure	5.75% (real pretax) 2.85% above the real risk-free rate	Small real increase in water usage charge
2005-06 to 2008-09	1.2% reduction compared to SWC forecast	14% below SWC's projected expenditure	6.5% (real pretax) 3.9% above real risk-free rate	Water usage charge increased from $A 1.20/kl to $A 1.85/kl.

table continues next page

TABLE 14.1. continued

Decision	Assumed efficiency improvement (real terms)		WACC	Pricing
	OPEX	CAPEX		
2008-09 to 2011/12	7% reduction in OPEX over four years based on 18% reduction in controllable costs. This was 1% larger than proposal by SW	6% efficiency adjustment to proposed CAPEX over four years	7.5% (real pretax) 5.1% above real risk-free rate	Removal of inclining block tariff, increase usage charge to $A 1.93/kl based on LRMC
2012-13 to 2015-16	Additional 4.7% reduction in controllable operating cost on top of SWC's projected 10% reduction per customer over the period	15% below SWC's projected expenditure	5.6% (real pretax) 4.8% above the real risk-free rate	Removed difference in fixed charges for houses and apartments and flats to remove cross-subsidies, reduced sewer usage charges to transition to SRMC

Source: IPART determinations.
Note: CAPEX = capital expenses; IPART = Independent Pricing and Regulatory Tribunal; OPEX = operating expenses; WACC = weighted average cost of capital; SWC = Sydney Water Corporation; SRMC = short-run marginal cost.

14.5. Form of Control

A regulator can regulate the prices of a regulated entity in a number of ways, including specific prices, weighted average price cap, and revenue cap. In water, IPART has set specific individual prices, while in other industries (such as electricity), IPART has used a weighted average price cap (WAPC). A WAPC gives the utility discretion on price structures. In the case of water, restructuring prices was controversial. IPART chose to set specific prices due to advantages in having the regulator "take responsibility" for changes in price structure. Both the government and SWC wanted this. However, this approach is heavy-handed and less efficient, and a move away from setting specific prices is overdue.

A WAPC and revenue caps differ in incentives and risk allocations. Under a WAPC, the utility bears the volume risk with a disincentive to encourage water efficiency; with the average prices set, the entity would benefit from increases in sales. In contrast, a revenue cap removes disincentives to promote water efficiency, but the customers bear the volume risk.

14.6. Future Challenges and Evolution

14.6.1. Sydney Water Corporation's Priorities to Improve Regulation

The basic approach to setting Annual Revenue Requirement (ARR) (building blocks) is well accepted and understood. In its most recent submission to IPART for the next regulatory period, SWC has focused on improving the approach through creating stronger incentives and better risk allocation. SWC is seeking (a) to move from setting specific prices to a WAPC; (b) stronger incentives to reduce controllable costs through the carry-forward of any efficiency gains into the next regulatory period cost pass-throughs for uncontrollable costs (e.g., tax changes or the costs of new environmental standards), and (c) a longer regulatory period.

WAPC

SWC's current form of regulation involves IPART setting price structures and maximum price levels for monopoly services that apply for each year of the determination. SWC sought

greater flexibility in its pricing through the introduction of a WAPC. A WAPC approach means that the utility sets all tariffs within a basket of regulated services each year, subject to a cap on the overall weighted average of charges and any additional side constraints that the regulator applies. Each year, the utility can adjust prices for each service as long as they meet the overall cap. Utilities can apportion costs between services and set prices to reflect costs. SWC claimed that this year-on-year adjustment (rebalancing) maximizes efficiency. It also introduces price flexibility that encourages SWC to ensure its prices meet two key aims: prices will reflect the costs of providing the service, and services can be targeted to particular customer groups to reflect their preferences (adding value). This would then drive more efficient allocation of resources to customers (allocative efficiency) during the regulatory period. Price flexibility would also allow SWC to use prices to respond quickly to changing supply and demand conditions in the future.

IPART decided not to introduce a WAPC for this regulatory period, but gave SWC the flexibility of entering into unregulated pricing agreements with its large nonresidential customers (IPART 2016). IPART considered that if both SWC and a large nonresidential customer are able to negotiate an arrangement that makes both parties better off, the regulatory framework should not prevent this. IPART recognized that SWC's proposed WAPC would provide greater pricing flexibility during the regulatory period. However, IPART did not introduce a WAPC as this would also introduce risks that could impact SWC's customers. The main risks would be price changes that are not necessarily cost reflective, and excess revenue generation for the business (IPART 2016).

Incentives to Reduce Controllable Costs

Productive efficiency of monopoly suppliers is a central objective of economic regulation. Economic efficiency is promoted by delivering services at the lowest efficient cost, where those costs are within the firm's control. Given cost-efficiency has a direct impact on prices, customers are likely to place high importance on its achievement. SWC proposed that IPART adopt the following cost incentive schemes.

Efficiency benefit sharing scheme (EBSS). This allows firms to keep gains for a defined period of time, regardless of the year of the regulatory period in which they achieve the cost-efficiency. Being able to carry over the efficiency benefit means there is a continuous and equal incentive for cost-efficiency in each year of the regulatory period. This corrects the current incentive to drive greater efficiencies earlier in the regulatory period, and promotes delivery of services to customers at the lowest efficient cost. It provides businesses with greater reward for lowering costs within its control, and penalises businesses for any overruns in the same costs. Customers will be better off over the long term by the extent to which the business lowers costs, as they pass the savings in full to customers through lower prices.

Cost-recovery schemes (CRS). These make sure businesses are not punished for material increases in costs for events beyond their control. The CRS complements the EBSS, and operates by the firm agreeing at the price determination to the scope and scale of costs that

might arise and the triggers that activate the mechanism. If the event transpires, costs are automatically passed through to customers. Customers only bear the costs approved by the regulator if these events actually occur. They do not pay upfront for costs that do not materialize.

SWC's current form of regulation allows it to keep profits resulting from cost savings made during the regulatory period, referred to as incentive regulation because it provides a financial incentive for utilities to deliver cost savings. Cost savings, if they are permanent, can be passed on to customers through lower prices in subsequent regulatory periods. A shortcoming of the current approach is that a saving made in year one of the regulatory period results in four years of additional profit, whereas a saving made in year three of the regulatory period results in just two years of additional profits. Thus there is an incentive to delay savings from the latter years of one regulatory period to the beginning of the next regulatory period. Rather than introduce an EBSS, IPART decided to introduce an efficiency carryover mechanism (ECM). An ECM allows gains or losses to be held for a specified period of time (e.g., four years), regardless of when they are achieved (IPART 2016).

Pass-Through of Uncontrollable Costs

The current framework sets efficient allowances for OPEX and capital expenses (CAPEX) for the regulatory period with an expectation that costs fluctuate up and down. Where a significant cost may be incurred, or not incurred, during a regulatory period and the utility has no control over it, there is a case for that cost to be passed through. Cost pass-through mechanisms allow the efficient costs of uncertain and uncontrolled events that arise during the regulatory period to be passed through to customers within the regulatory period. A pass-through arrangement would be better than allowing for costs upfront, due to the high level of uncertainty about whether those costs will be incurred. IPART decided to allow cost pass-through of Shoalhaven transfers and SDP's additional costs when it operates (IPART 2016). IPART considers that the circumstances under which a cost pass-through should apply are the following:

- There is a trigger event (to activate the cost pass-through), which can be clearly defined and identified in the price determination.
- The resulting efficient cost associated with the trigger event can be fully assessed, including other factors that may fully or partially offset the direct cost of the event.
- The resulting cost is assessed to exceed a materiality threshold.
- The regulated business cannot influence the likelihood of the trigger event or the resulting cost.
- The mechanism is symmetric in that it applies equally to both cost increases and cost decreases (in cases where the risk can result in both).
- It is clear that the cost pass-through will result in prices that better reflect the efficient cost of service.

A Longer Regulatory Period

SWC proposed that the determination period be increased from three years to four years. IPART agreed with this proposal because of (a) the level of confidence in forecasts over a four-year term; (b) the risk of structural change in the sector over the four years is low; (c) the need for price flexibility and incentives for efficiency; (d) the need for regulatory certainty and financial stability; and (e) the benefits of aligning the price determination period with the term of the operating license (IPART 2016).

14.6.2. Future Challenges

Increasing Costs of Connecting New Customers

New houses on the urban fringe, especially if the developments are out of sequence or in difficult areas to service, are more expensive to service than houses in existing areas. However, under the government's policy of postage stamp pricing and no developer charges, prices do not signal these costs or provide adequate funding for urban expansion on the fringe of the city. This creates a significant cost risk for SWC, and a consequent price risk for customers.

While infill growth can currently be serviced using existing infrastructure, servicing greenfield areas requires major network expansions and upgrades to existing plants. In the period to 2016, SWC plans on servicing 27,000 new lots per annum. The CAPEX to service this growth will total $A 684 million, or around 25 percent of the total CAPEX spend. Currently, the cost of servicing greenfield lots is on average five to six times higher than for servicing infill lots (SWC 2016). In the absence of strong price signals there is a risk that more development will occur in areas that are more expensive to serve, further increasing the spending on growth-related CAPEX to be funded by other customers.

SWC and IPART have a common interest in ensuring efficient development, but there are substantial political constraints on using prices to signal costs. One option would be to reestablish the previous developer charges, which signaled costs, but this would be contrary to the government's policies on urban development and housing affordability. In the absence of this, reliance will be placed on stronger planning controls on the sequencing of development, possibly supported by institutional and funding changes within government (such as central budget holders for urban development infrastructure). SWC can manage its risk by prioritizing the servicing of lower cost areas, leaving more expensive areas to be served by private service providers if they are to proceed.

Changing Environmental Standards

A government-owned utility is an easy "target" for the environmental regulator. This leads to concerns about rising standards with large cost and price impacts. SWC and IPART have a common interest in ensuring new standards are reasonable (i.e., benefits exceed costs). IPART raised concerns in its first review (1993) regarding the cost and price implication of higher environmental standards, whereby these standards may not be the most efficient means of achieving the desired environmental goals or where they may not adequately consider the community's willingness to pay (GPT 1993c).

In its 2016 submission to IPART, SWC stated that "any tightening of environmental standards, such as the discharge levels into the Hawkesbury-Nepean River, would increase the costs of supplying wastewater services, widening the cost gap between greenfield and infill developments. It would also mean wastewater becomes an even higher proportion of the overall customer bill. In 2016-20, the proportion of the bill for an average customer will be 52 percent wastewater, 48 percent water." (SWC 2016, xi) As noted above, IPART is again concerned about the potential impact of rising standards on costs and prices, and foreshadowed that it may not pass through the costs of standards it considers excessive. This an unusual and high-risk strategy for the regulator, as it leaves the utility unable to recover costs it is legally obliged to incur.

Notes

1. The Australian government commissioned Professor Fred Hilmer to chair an inquiry into national competition policy. The Commission of Inquiry reported to the government in August 1993 (National Competition Policy Review 1993).
2. Premier Nick Greiner, GPT Bill 1992, Second Reading Speech.
3. Queensland has a pricing regulator (QCA), but at the time of writing it does not regulate (set or recommend) urban water prices. The QCA monitors water prices in South East Queensland to assess whether households and businesses are paying a price comparable with the costs of providing the relevant services. See QCA's website May 25, 2016.
4. IPART Act, section 16.
5. IPART Act, section 18.
6. IPART set water usage prices based on the LRMC for HWC, Gosford Council, and Wyong Council in its 2009 determinations for those agencies.

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Chapter 15 Current Performance and Outcomes

This chapter examines the current performance and trends over time in terms of prices, cost recovery, efficiency, and quality of service. Water prices have become more cost-reflective, providing better signals to consumers and a better basis for funding services. Consumption charging is now the rule for urban water. Cross-subsidies between different types of users have largely been eliminated, and the prices of water and related services now better reflect the costs of those services. Prices are now more efficient and fair, and profitability of Sydney Water Corporation (SWC) has improved. Prices initially fell and then were stable to 2008 but when they needed to rise because costs rose, a 40 percentage points increase over four years was achieved.

While less directly attributable to price regulation in this period, the quality of service has improved. In the early period of regulation, the utilities achieved ambitious cost reduction targets, primarily by reducing employee numbers. Partial performance indicators support the view that there have also been significant improvements in operational efficiency. However, from the mid-1990s to 2010, measured productivity did not increase, although this does not take quality improvements into account.

15.1. Prices

Reform of urban water pricing dates back to the early 1980s. The pricing structures of the time resulted in inappropriate use of water, since there was no signal to consumers of the cost of using additional water. Prior to reform, water prices were mostly fixed and did not provide incentives to consumers to manage their demand. Charges were based on property taxes and cross-subsidies were rife. Reforming prices was slow. Initially commenced in the Hunter in 1982, it wasn't until the mid-1990s that prices in Sydney were predominately usage-based.

Two features of the reform process warrant discussion as they demonstrate the how politics can affect the reform process. First, Hunter Water Corporation (HWC) was the first water utility to introduce usage charges in 1982. It took almost 10 years before SWC was able to follow suit. HWC had been able to reform itself in the absence of price regulation, yet SWC was not able to until after an independent regulator had been established. Reform of pricing for SWC may have been more difficult than for HWC because it was too controversial politically. SWC covered a much larger area and a more politically diverse region than in the Hunter. When the Hunter reforms commenced there were few seats in the region that were tightly contested, whereas the Sydney area contained a larger number of seats including a number of key marginal seats. Therefore, the government was less willing to introduce water usage charges in Sydney.

Second, clearly, cross-subsidies were an issue. However, it wasn't simply a matter of the business sector subsidizing the residential sector. There were differences in subsidies within the business sector, with small to medium businesses subsidizing large businesses.

The primary beneficiaries of these subsidies were groups with political power, such as residential and large business users.

This section discusses the principles of using two-part tariffs to signal to consumers the true cost of water use. It also discusses the process of reform over a number of decades, with particular attention to SWC and HWC, describing key outcomes of these reforms.

15.1.1. Pricing Reform

Pre-1980s

Prior to the 1980s, urban water bills were determined by the value of the property using the service. Charges for water, wastewater and stormwater are a charge against the property. In effect, water was paid for by a system of taxation on property values. Each household was given a water allowance determined by the property value. The higher the property value, the higher the water allowance. Consumption above the water allowance was considered excess, and charged at a usage rate.

Most ratepayers used less than their water allowance and effectively faced a zero price for their additional consumption. Consequently, water agencies were unable to manage water demand and responded to increasing water use (partly caused by a zero or low water price) by expanding supply, which was then paid for by an increase in water rates. In addition, different users' water allowances varied depending on the rates paid, so that virtually every urban water user faced a different average price of water. These different average prices, coupled with the fact that properties could be valued on different bases depending on whether they were used for residential, commercial or industrial purposes, meant that cross-subsidization was an endemic feature between different user groups as well as within user groups.

1980s[1]

HWC introduced pay-for-use pricing in 1982, following a period of drought. HWC wanted to address increased demand but was constrained by revenue shortfalls, lack of funding from government, maintenance backlog, and management problems. HWC introduced "user pays" charges for residential customers by eliminating the free water allowance and introducing a two-part tariff schedule. The two-part tariff included an access charge, a usage charge, and a property tax component. Despite a strong reaction from the local community, the reforms remained. As a result of the reforms, water consumption dropped by 30 percent within the first few years.

In contrast, SWC made slow progress in introducing usage charges. In 1986-87, SWC moved from a water allowance based on rating value to a free water allowance (initially 300 kL per annum). As the allowance was well above the median water consumption, most households did not pay a usage charge.

1990s

In 1992, water charges (and hence revenue) were largely dependent on property values and fixed service charges. In Sydney, excess water charges generally only applied after water

usage exceeded overly generous water allowances. As a consequence, ratepayers using less than their water allowances or whose properties were unmetered did not see price signals for each unit of water they consumed. Thus, these charging arrangements did little to ensure the efficient use of water. Underpricing water use encouraged growth in demand with rising standards of living and population. As Hunter Water Corporation (HWC) had shown in the 1980s when it introduced water meters and usage charges, pricing water better can help defer the need for major new investment. At the same time, the commercial and industrial sectors were subsidizing the residential sector. Therefore, Sydney had one of the cheapest residential water and wastewater bills in Australia and the most expensive nonresidential bills in the world.

The residential sector, encompassing 93 percent of properties provided with a water service, consumed 66 percent of water and yet contributed just over 50 percent of revenue to defray the cost of water and sewerage services. At the same time, more than a third of SWC's total revenue was derived from property value-based taxes and a further 40 percent from fixed service charges. Only 20 percent of SWC's total revenue was generated from charges that depended on the amount of water consumed or sewerage discharged.

Following its review of water services in 1992 and 1993, the Independent Pricing and Regulatory Tribunal (IPART) put in place a program of reforms for the metropolitan water agencies of New South Wales (GPT 1993). Key elements of the reform process included eliminating free water allowances where this had not already occurred, and progressively eliminating property value-based rates as a source of revenue, with priority to be given to the reform of the nonresidential sector. In addition, the process moved to a simple two-part tariff with a uniform usage charge to apply to all water used. In recent years the usage charge has been set in relation to the LRMC of water (the additional cost of making more water available). The reforms have rigorously pursued efficiency gains by the water supply agencies, accompanied by real revenue reductions over the short to medium term. This was accompanied with a recommendation that water agencies benchmark their activities against similar agencies internationally. Finally, the reforms have adopted charging arrangements for land developers which ensure that costs of infrastructure provision are fully recovered through a combination of common periodic charges and upfront contributions.

SWC had the scope to contribute to reforming its pricing regimes through making cost savings. Over the course of the reform process, SWC was able to reduce staff numbers substantially. By 2005, it employed less than half the staff it had employed in 1993. However, the establishment of the then SCA in 1999 took some staff from SWC.[2]

2000s

Water prices are now based on a two-part tariff (fixed and usage charges), which is considered to be an efficient approach to water pricing. Both SWC and HWC now have a single usage charge for all water consumption, however this was not always the case. During the 2000s, HWC had a declining block tariff structure while SWC, for a short period, introduced an inclining block tariff.

Sydney Water Corporation's Inclining Block Tariff

In 2005, IPART introduced an inclining block tariff (IBT) with a two-tiered usage charge for individually metered residential properties. IPART introduced this because of its considerable potential to reduce demand in the face of drought conditions, as well as the emerging imbalance between the supply of water and the demand for water. At the time, there was significant community and government support for water conservation. The tier 1 usage charge applied to residential volumes up to 100 kL per quarter and reflected the lower end of IPART's LRMC of supply estimate at the time prices were determined. The higher tier 2 usage charge applied to volumes in excess of 100 kL per quarter.

IBTs have both pros and cons. They can be an effective tool for reducing usage, which is particularly beneficial when water is in short supply. They may also be desirable from a social equity perspective if low-income households pay a relatively low charge to meet basic water needs. However, water pricing is done on a per household basis and not a per capita basis, so IBTs are unlikely to accurately target discretionary use. Furthermore, IBTs are inefficient (because at least some consumption is priced at a level higher or lower than marginal cost), and are unlikely to balance supply and demand on their own.

IPART removed the two-tier usage charge for SWC residential customers in its 2008 Determination (IPART 2008). The tier 2 usage charge was removed by progressively raising the tier 1 price to the point where it is equal to the tier 2 price. This resulted in a single price for all units of water from July 1, 2009. IPART noted that:

> While support for the retention of an IBT in submissions was mixed, IPART considers that an IBT is no longer warranted given the current lack of water scarcity in Sydney. It considers that a single usage charge set at the LRMC of supply is more appropriate, because it provides efficient price signals to consumers about the long term cost consequences of their consumption (IPART 2008, 93)

Given that IPART adopted the higher tier price for water as the new usage price, it seems that the tier 2 price was the long-run marginal cost (LRMC) for water and that water was below LRMC at the tier 1 consumption levels. With hindsight, the inclining block tariff was a means of transitioning to a significantly higher usage charge.

Hunter Water Corporation's Declining Block Tariff

In July 2001, HWC introduced a third tier to its declining block tariff as a location-based water usage charge for industrial customers with very high water consumption (submission to IPART, 2000). The location-based charges applied only in areas close to water sources, and reflected the lower network costs of supplying water in these areas because less distribution infrastructure is used. This lower usage charge only applied to customers who consume greater than 50,000 kL per year and only for designated areas close to water sources.

In the 2005 determination, HWC asked to remove the second tier for usage above 1,000 kL per annum. This resulted from pressures placed on HWC during the drought.

HWC acknowledged that maintaining the declining tariff structure for customers other than houses would appear inconsistent with the need for stronger price signals to manage demand. IPART removed the second tier within the 2005 determination period by increasing the price of tier 2 water at a greater rate than the tier 1 price (IPART 2005).

2010s

IPART's 2012 determination for SWC restructured water, sewerage, and stormwater prices to remove some remaining cross-subsidies between customer groups and improve the cost reflectivity of these prices (IPART 2012b). This price restructuring did not increase the total revenue SWC receives for services. Rather, it removed inequities and improved the balance between fixed service charges and variable usage charges to better represent the costs that customers in all groups impose on SWC.

This price restructure for SWC followed IPART's review of the price structures of SWC and the other metropolitan water utilities it regulates (IPART 2012a). This review found that under the then-current price structures, the fixed charges that some SWC customers pay do not reflect the cost of servicing them. At the time, the water service charges paid by houses were subsidizing the services received by flats and units and as a result, the discounts for units and flats were removed in the restructure. The price restructuring also ensured that SWC's prices sent efficient price signals.

15.1.2. Current Water Prices

Consistent with efficient pricing principles, IPART uses a two-part tariff to charge for water. IPART has generally set a single water usage price that is consistent with the LRMC of supply for each of the metropolitan water agencies it regulates. In addition to usage charges, all properties (residential and nonresidential) pay a quarterly service charge, which is levied to recover the agency's remaining revenue requirement. The service charge for commercial and industrial properties is levied according to meter size, so that properties with larger meters pay a higher service charge. Table 15.1 provides a summary of water prices for the metropolitan water agencies for 2016–17.

TABLE 15.1. Water Prices for Sydney Water Corporation and Hunter Water Corporation, 2016–17

Australian $

	SWC	HWC
Residential service charge per year[a]	90.04	25.69
Residential usage per kiloliter	2.00	2.25
Nonresidential service charge per year: 20 mm[b]	90.04	25.69

Sources: SWC; HWC.

Note: HWC = Hunter Water Corporation; SWC = Sydney Water Corporation.

a. In 2015–16 SWC's service charge was A$ 102.56 and the usage charge was $A 2.276 per kiloliter.

b. The nonresidential service charge increases with the size of service meter.

Periodic charges reflect the average cost of supply, and are uniform throughout each agency's area of operation. This is known as postage stamp pricing. The use of postage stamp pricing for periodic water services results in prices that do not signal the diversity in costs of providing these services to different locations. It is worth noting that the fixed charge for HWC is much smaller than that for SWC.

15.1.3. Key Outcomes

Water prices have become more cost reflective to provide better signals to consumers and a better basis for funding services. Consumption charging is now the rule for urban water. Cross-subsidies between different types of users have largely been eliminated, and the prices of water and related services now better reflect the costs of those services. Over the period that IPART has regulated water prices the following changes have occurred:

- Increase in usage charges to reflect marginal costs (encouraging efficient use of water and discharge of waste)
- Reduction in cross-subsidies
- Removal of property tax component
- Significant increase in prices achieved to cover cost increases due to investment in water security and higher discharge standards

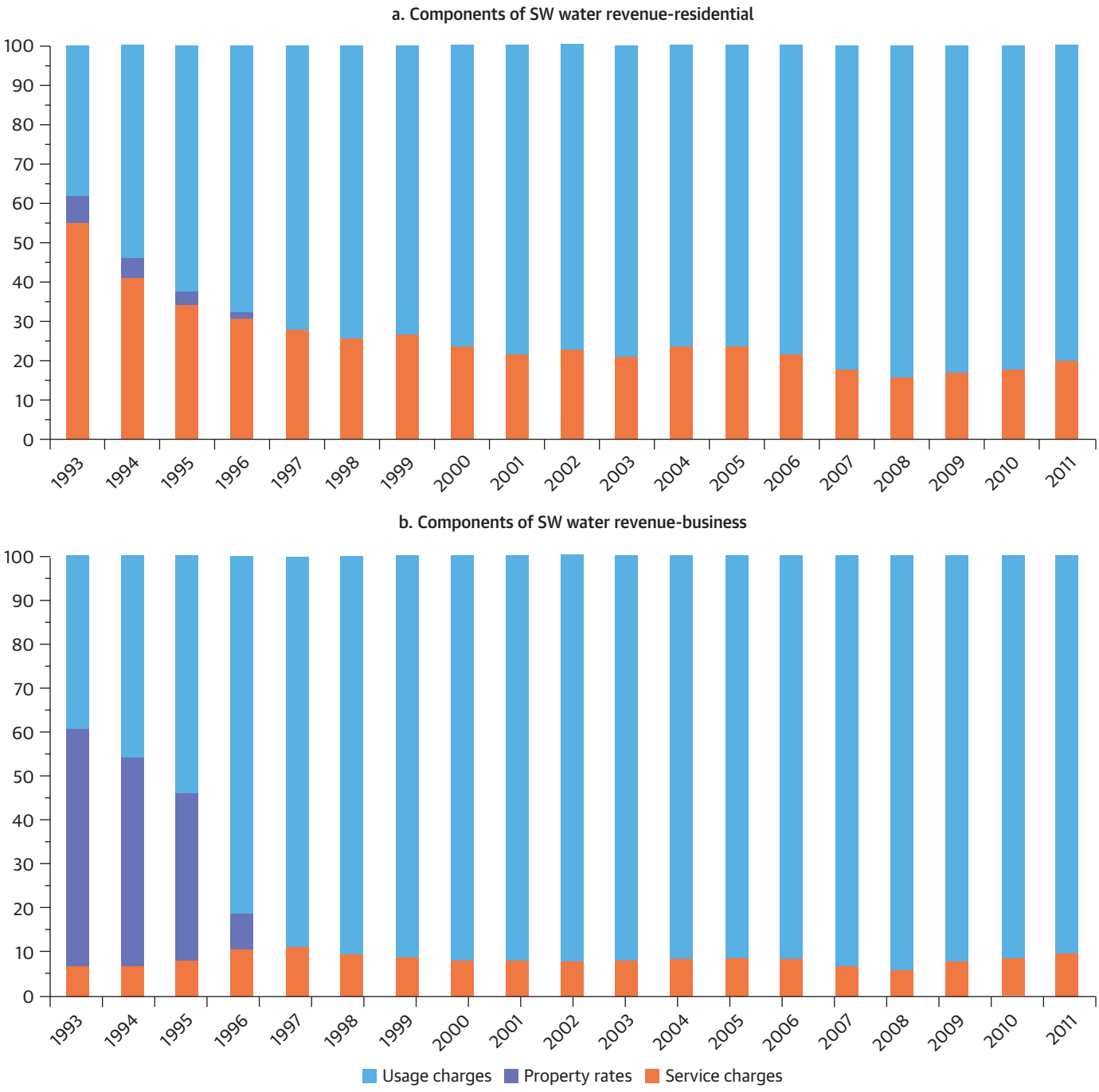
As a result of the reforms that have occurred over the past 25 years, (a) prices are fairer and more efficient; (b) prices fell for much of the period (but when they needed to rise because costs rose, a 40 percent increase over four years was achieved); and (c) profitability has improved. Other changes less directly attributable to price regulation were achieved in this period: (a) quality of service has improved; (b) measured productivity did not improve through to 2010 (but this does not take account of quality improvements); and (c) partial performance indicators show significant improvements in operational efficiency.

Prices Are Fairer and More Efficient

There were real reductions in prices over the first regulatory period (1993-96), which helped achieve substantial price reform. First, the property tax was phased out, meaning that business water bills were reduced more than residential water bills. Second, loss of revenue from removing the property tax component of charges was offset by a usage charge, providing a better signal of the costs of water use. Finally, fixed charges were reduced for households. Panels a and b of figure 15.1 show the distribution shift of SWC's water revenue by customer class over this period. By 1997, all property tax charges had been removed and revenue was predominantly from usage charges.

Today, charges for residential and business customers are set on the same basis and cross-subsidies have been largely removed. As a result, charges reflect costs, send better signals for efficient usage, as usage charges reflect marginal costs of supply, and are cross-subsidy free.

FIGURE 15.1. **Components of Sydney Water Corporation Revenue, 1993–2011**



Source: https://www.ipart.nsw.gov.au/files/assets/website/presentations/ipart_conference_presentation_-_james_cox_psm.pdf.

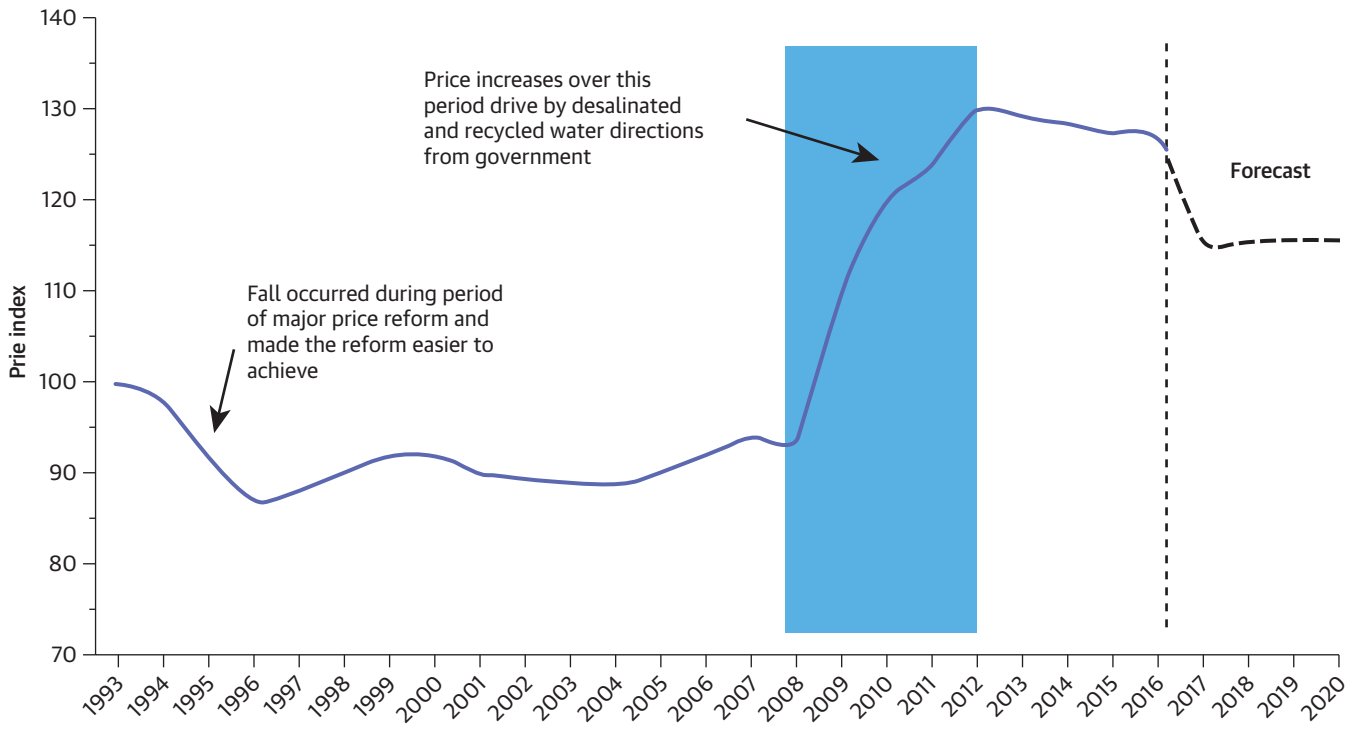
Average residential water bills are almost 30 percent higher than they were in 1993. As shown in figure 15.2, over the period that IPART has regulated SWC, average residential bills have mostly remained constant or declined in real terms. The exception was during a period of major spending to increase reliability of water supply (the desalination plant) and improve environmental outcomes (recycling and better stormwater management). This resulted in a 40 percent increase over four years, a significant achievement for a regulator.

Between 1992/93 and 2008/09, residential water prices have increased in real terms for SWC customers, with a significant increase occurring in 2008/09. Overall, a residential customer of SWC using 220 kL of water each year would have paid 14.2 percent more for water and sewerage services in 2008/09 than in 1992/93, while a HWC customer would have paid 14.3 percent less (Cox 2010).

The decreases in residential water and sewerage charges over the period from 1993 to 2008 were the result of substantial efficiency gains made possible by the introduction of price regulation in 1993. SWC's 2008 determination increased bills in real terms by 32.6 percent for a typical residential customer over the four years of the determination, in large part to fund an expanded capital program including new sources of water supply (e.g., desalination).

Similarly, HWC's 2009 determination increased the annual bill for a typical residential customer in real terms by 30.7 percent over four years. This price increase funded increases

FIGURE 15.2. Index of Average Residential Bills (in Real Terms)



Source: SWC (2015).

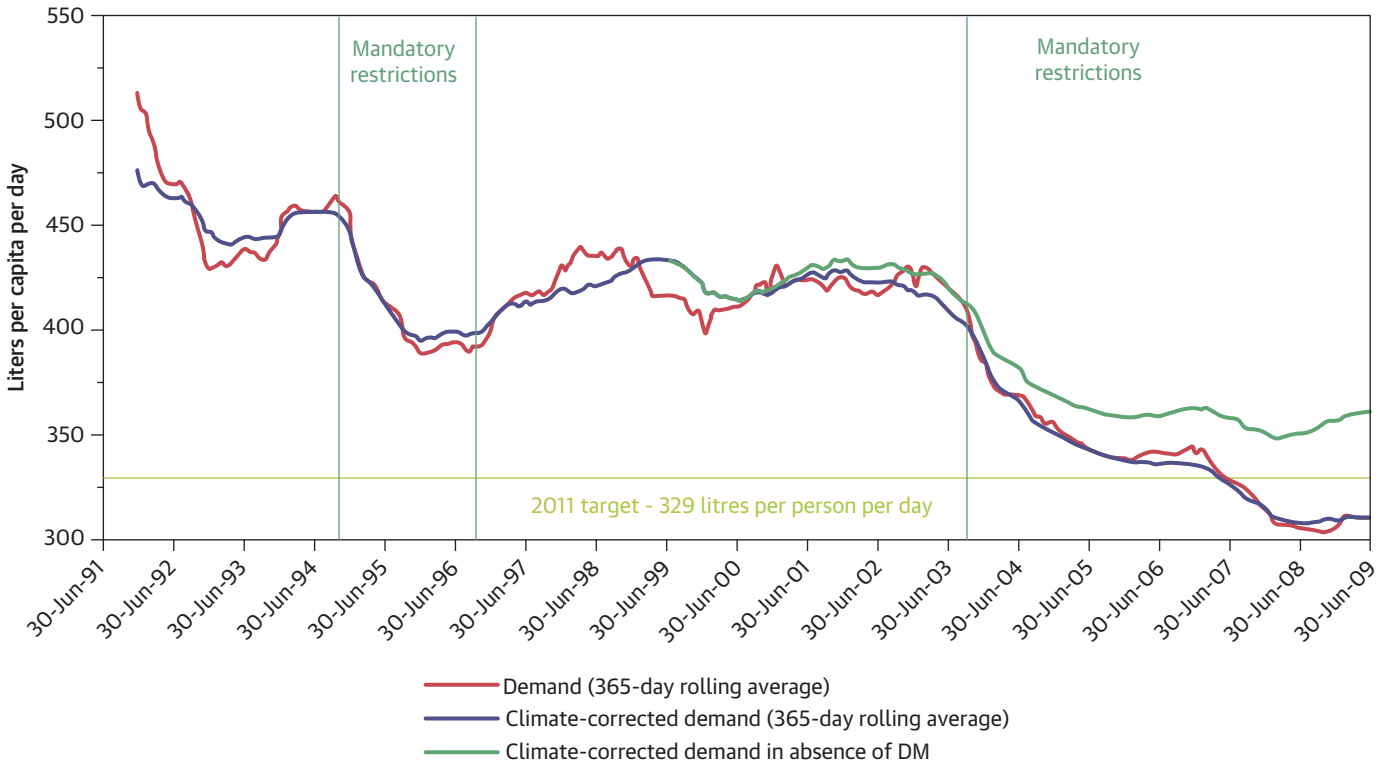
in operating expenditure and a large capital program, including initial investments in Tillegra Dam and upgrades in the water and sewerage systems. With the decision to abandon the construction of Tillegra Dam, IPART revised the pricing determination to pay back the costs of the dam to the consumers.

Impact of Water Usage Prices on Consumption

The impacts of increasing prices on water use are difficult to measure during a drought, when restrictions are in place. It is likely that a combination of suasion (i.e., water conservation programs, education, awareness building), restrictions, and investments in technical water use efficiency had a much greater influence than pricing reforms. However, it is likely that increases in volumetric prices also played a role.

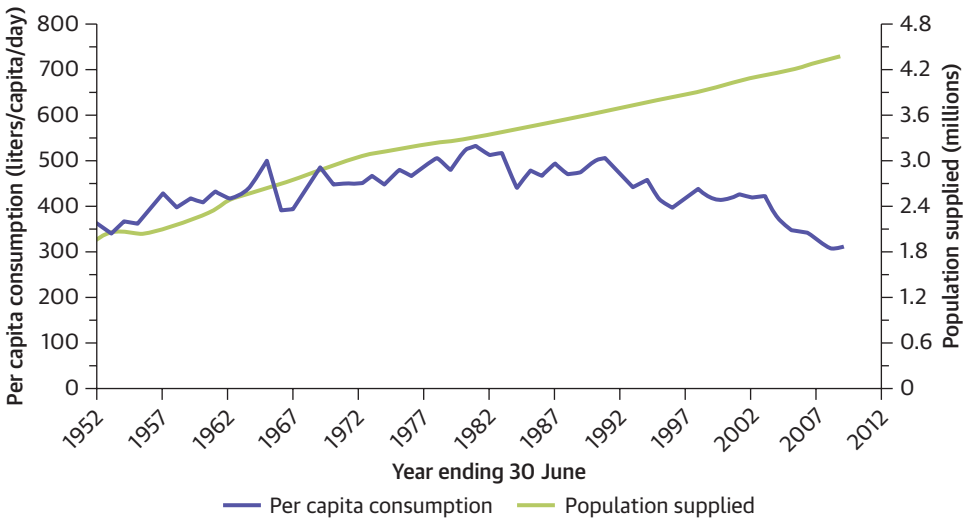
The introduction of voluntary restrictions in November 2002 achieved savings of 3 percent. Following the introduction of level 1 mandatory restrictions in October 2003, total savings of 12 percent were achieved. Level 2 restrictions were in place from June 2004 to June 2005, achieving savings of 16 percent. The introduction of level 3 restrictions increased the total savings to 17 percent (SWC 2009). (See Figures 15.3 and 15.4.)

FIGURE 15.3. Per Person Demand Trends, 1991–2009 (12-Month Rolling Average), Sydney Water Corporation



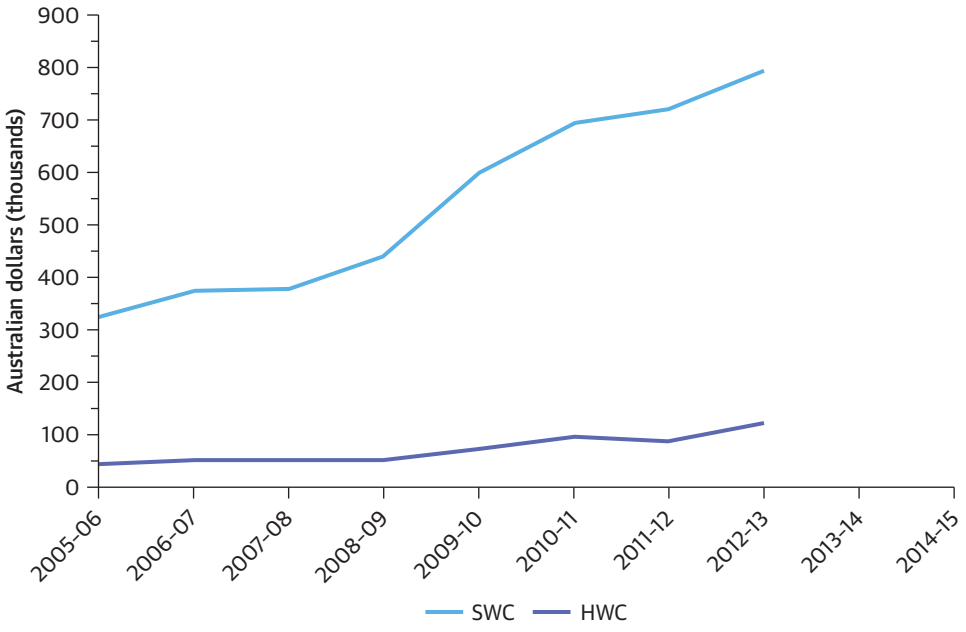
Source: SWC 2009, 10.
Note: DM =

FIGURE 15.4. Per Person Water Demand Since 1952, Sydney Water Corporation



Source: SWC 2009, 40.

FIGURE 15.5. Value of Payment Assistance Vouchers Provided to Customers



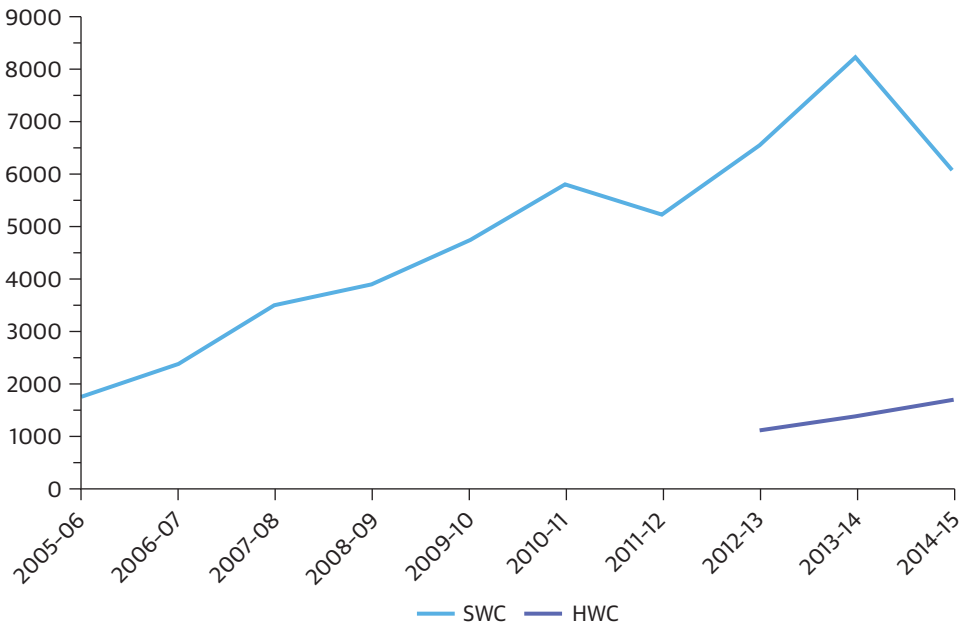
Source: IPART New South Wales Public Water Utilities Performance Indicator Database 2014–15.
Note: HWC = Hunter Water Corporation; SWC = Sydney Water Corporation.

Impact of Prices on Affordability

As noted earlier, IPART has not considered that it has a role in social pricing. While it has phased-in price changes to avoid sudden bill shocks, its focus has been on removing cross-subsidies rather than introducing new ongoing cross-subsidies. The primary instruments for addressing affordability are the governments two budget-funded assistance schemes: the rebate off water bills for customers on social benefits, and the emergency assistance vouchers provided by the government and distributed by social welfare support agencies such as St Vincent de Pauls.

Two indicators of the extent to which the increase in prices have impacted on the affordability of water services for vulnerable households are the number of emergency assistance vouchers issued and the number of customers on whom flow restrictions have been imposed. Figures 15.5 and 15.6 show that, since 2008-09, customers have increasingly experienced difficulty in paying their water bills. SWC and HWC do not disconnect customers with unpaid bills, but they do restrict the flow of water supplied to these customers. The number of such restrictions has increased since 2005-06.

FIGURE 15.6. Total Number of Residential Customers on Whom Water Flow Restrictions Have been Imposed

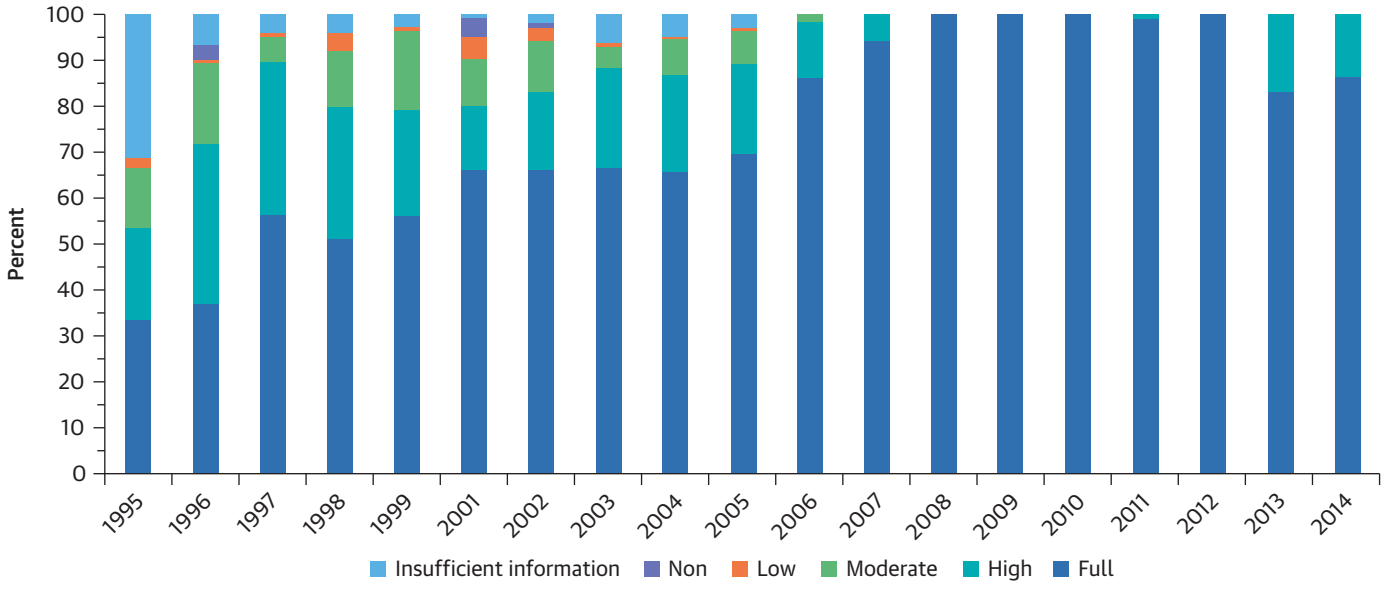


Source: IPART New South Wales Public Water Utilities Performance Indicator Database 2014–15.
Note: HWC = Hunter Water Corporation; SWC = Sydney Water Corporation.

Quality of Service Has Improved

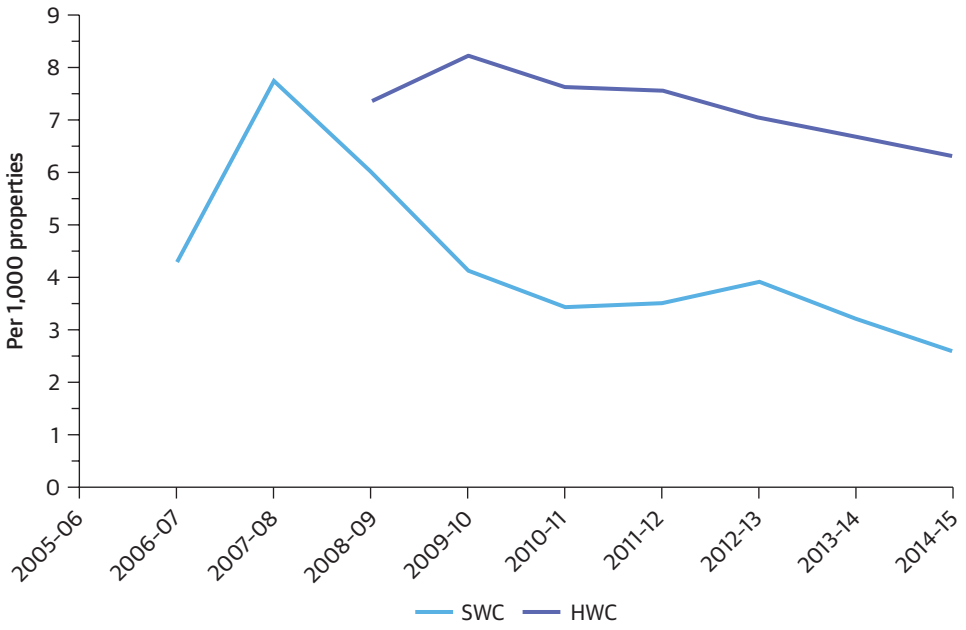
SWC's compliance with license conditions (covering various quality of service and asset management indicators) has improved substantially since the license was first introduced in 1995 (see figure 15.7). During this period, SWC's compliance with environmental protection licenses has also improved significantly. For the past eight years, independent audits found that SWC has achieved either high or full compliance against its operating license. Audit results have steadily improved since 1995. The increase in high compliance and relative decrease in full compliance in

FIGURE 15.7. Operating License Performance, 1995–2014



Source: Sydney Water 2016.

FIGURE 15.8. Water and Sewerage Complaints



Source: IPART New South Wales Public Water Utilities Performance Indicator Database 2014–15.
Note: HWC = Hunter Water Corporation; SWC = Sydney Water Corporation.

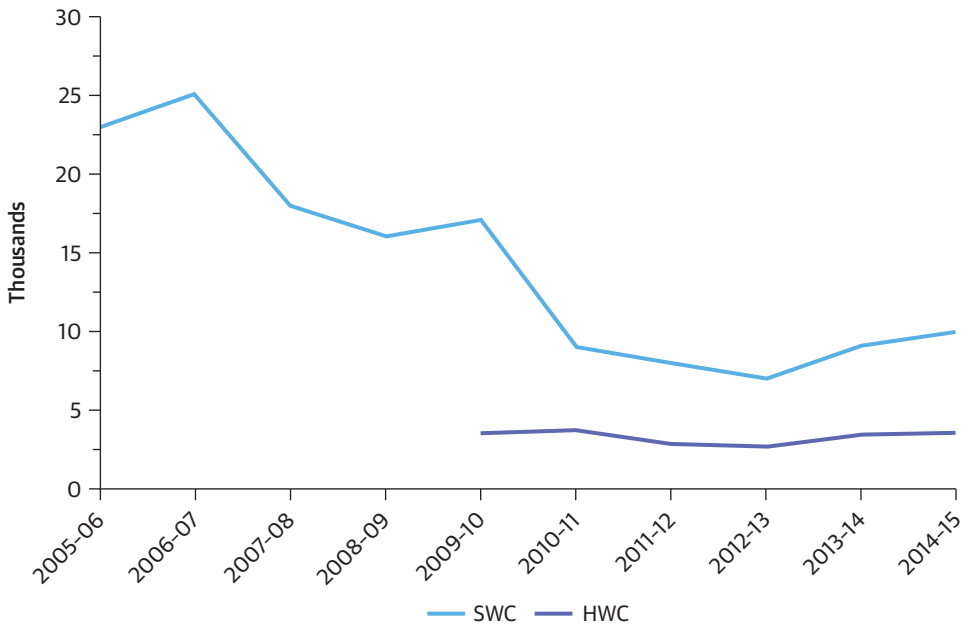
FIGURE 15.9. Number of Properties Experiencing Unplanned Water Outages > 5 Hours

Source: IPART New South Wales Public Water Utilities Performance Indicator Database 2014–15.
Note: HWC = Hunter Water Corporation; SWC = Sydney Water Corporation.

years 2013 and 2014 were due to shortcomings in recycled water quality, and customer and consumer rights, which had no impact on SWC's ability to complete defined objectives or assure controlled processes, products or outcomes (SWC 2016). The number of water and sewerage complaints per thousand properties has declined over the period 2006-07 to 2014-15 (see figure 15.8). The number of properties experiencing unplanned water outages greater than five hours dropped over the period 2008-09 to 2010-11, then increased (see figure 15.9). The number of properties experiencing uncontrolled sewage overflows in dry weather decreased over the period to 2012-13, but has increased since (see figure 15.10).

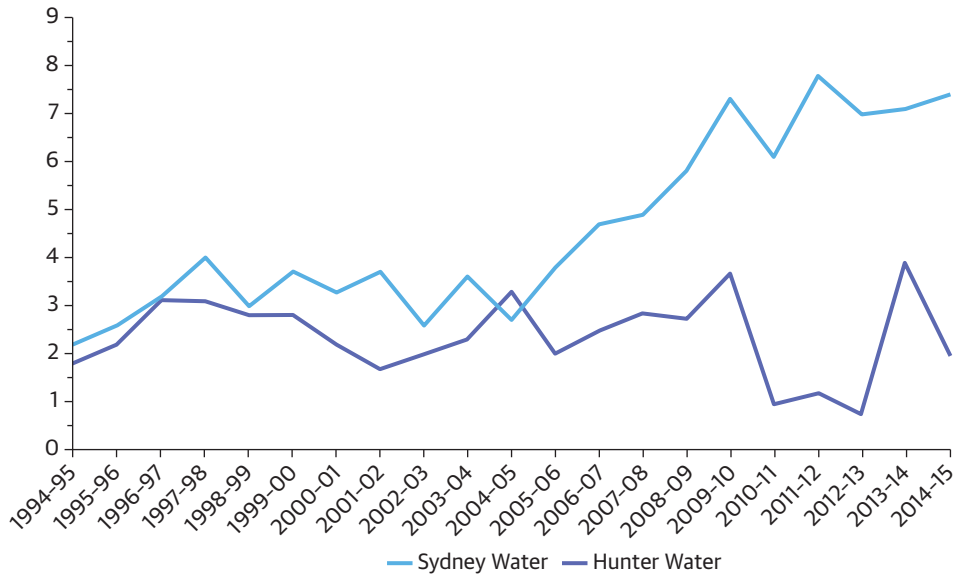
Another aspect of quality improvements was an increase in the standards required of HWC and SWC (e.g., effluent discharges). The Environment Protection Authority (EPA) has no explicit requirement to consider the efficiency of standards or requirements it imposes on SWC. IPART noted this in its recent submission to the EPA on the environmental protection licenses for wastewater treatment, outlining that to the extent certain environmental regulations were inefficient, it could determine that only a portion of the associated costs be passed through to

FIGURE 15.10. Number of Properties Experiencing Uncontrolled Sewage Overflows in Dry Weather



Source: IPART New South Wales Public Water Utilities Performance Indicator Database 2014–15.
Note: HWC = Hunter Water Corporation; SWC = Sydney Water Corporation.

FIGURE 15.11. Return on Assets, Sydney Water Corporation and Hunter Water Corporation, 1994/95 to 2014/15



Source: HWC 2011, 2015; SWC.
Note: HWC return on assets is calculated as operating profit plus net interest and financial charges divided by the written down book value of infrastructure assets and works in progress.

customers through prices (IPART 2015). IPART noted that a utility's prices would be higher if the cost of complying with the regulation is higher than the economic benefits, and the regulation is designed in a way that doesn't allow for the most efficient means of achieving it (IPART 2015).

15.2. Profitability and Financing

15.2.1. Profitability

It is interesting to note how SWC and HWC have fared financially through the changes in price structures and productivity. A number of factors will affect the reported return on assets: (a) the efficiency improvements assumed in the determinations of prices; (b) whether the utility has been able to achieve the assumed efficiency improvements; (c) the allowed weighted average cost of capital (WACC) built into the determination of prices; and (d) the basis of the book valuation of assets and any revaluations. Figure 15.11 Shows Improvement in SWC's Profitability, Particularly from around 2005/6, with the Return on Assets Doubling.

Through its early pricing decisions, IPART gave priority to price reform. IPART assumed substantial increases in efficiency (20 percent to

25 percent in each of the first two regulatory periods; see Table 6 in section 8.4). Under the approach adopted by the tribunal in these decisions, which focused on maintaining reasonable cash flows, the benefits of these efficiency gains went to customers to facilitate price reform and removal of cross-subsidies. From the decision in 2001, IPART included a specific WACC in the buildup of prices, and over time the margin in the WACC above the risk-free rate increased. Furthermore, after the large efficiency gains in previous years, the expert reviews identified less scope for further efficiency gains. The outcome was an increase in the return on assets, and in recent years SWC has beaten the efficiency targets set, allowing it to exceed the WACC set in the determination.

Interestingly, HWC's profit has not increased to the same extent that SWC's has, despite the same approach being used in the determination of revenues, assessment of efficiency improvements, and the allowed WACC. One factor has been the timing of the determinations, and their impact on the cost of capital. Through the 2000s, the decisions for SWC and HWC were made in separate years, and until 2013 the WACC reflected current interest rates. In the period after the Global Financial Crisis, the variations in interest rates had a significant effect on the allowed WACC. HWC's determination occurred during a period of low interest rates in 2009, suppressing its WACC compared to that allowed for SWC in the previous year. Furthermore, in that determination, HWC proposed operating expenses (OPEX) and capital expenses (CAPEX) costs that implied substantial efficiency gains in the face of a substantially increased CAPEX program due to the new Tillegra Dam. Subsequently, the construction of the dam was cancelled and the revenues adjusted to remove these costs. These factors may explain the drop in profitability after 2009.

IPART now sets SWC's and HWC's WACCs on a commercial basis consistent with the approach IPART uses for the energy businesses.[3] However, the beta of 0.7 is specific to urban water. If they achieve the projected cost targets, they should be able to earn a commercial return.

15.2.2. Increase in Stand-Alone Credit Rating

Moody's Investors Services upgraded SWC's credit rating from Baa2 to Baa1. This was the first upgrade in the last 20 years. Moody's noted in upgrading SWC's credit rating, that it was due in part to improved transparency in IPART's regulatory framework. In particular, Moody's expects that IPART will continue to exhibit consistency in its decisions, translating into increased stability in revenue outcomes for SWC (Moody's 2015; SWC 2016).

15.3. Increased Efficiency

While there are strong reasons to expect that better governance and regulation will lead to increased efficiency, it is difficult to demonstrate this empirically due to (a) the absence of continuous consistent data; (b) the partial nature of many measures of efficiency (such as OPEX per customer); (c) the contemporaneous changes in service quality and difficulty of quantifying the value cost of these; and (d) the impact of other factors that affect performance, particularly

for individual utilities, such as the quality of the utility's management and the implementation of the governance regime.[4] Furthermore, given that the changes in governance and regulation have occurred over the same period, it is difficult to disentangle the effects of each.

Three separate sources of information covering different periods suggest a net improvement in productivity, especially when the increase in quality of services (in terms of security of supply and the environmental impact of discharges of wastewater and stormwater) are considered. First, the reduction in employee numbers of 35 percent in the first regulatory period to 1996, in response to the strong cost reduction targets set by IPART in its determination of 1993. Second, the assessment by IPART in its review of the productivity performance of HWC and SWC from 1996-2009, which concluded that (a) while the total factor productivity (TFP) deteriorated in the latter years in the period, this was due to substantial capital investments to improve the quality of service, especially security of supply; (b) labor productivity increased by around 100 percent in both HWC and SWC over the period; and (c) SWC and HWC performed well relatively to their peers in Australia. Finally, SWC's estimate of its current and projected TFP in the three years to 2015-16 shows a significant improvement in TFP of 5.4 percent over the period (based on SWC's forecast OPEX and CAPEX).

15.3.1. Productivity and Costs

1993-96

SWC achieved substantial reductions in operating costs that were largely in line with IPART's assumed cost savings in the first two regulatory periods. In its second determination in 1996, IPART found that:

> In the past three years, Sydney Water has made impressive progress in improving efficiency. Real operating cost per property is projected to be 22% lower in 1995/96 than in 1992/93. The SWC targets to reduce underlying operating cost per property by 45% in 2000/01 from the 1992/93 level. (IPART 1996, 3)

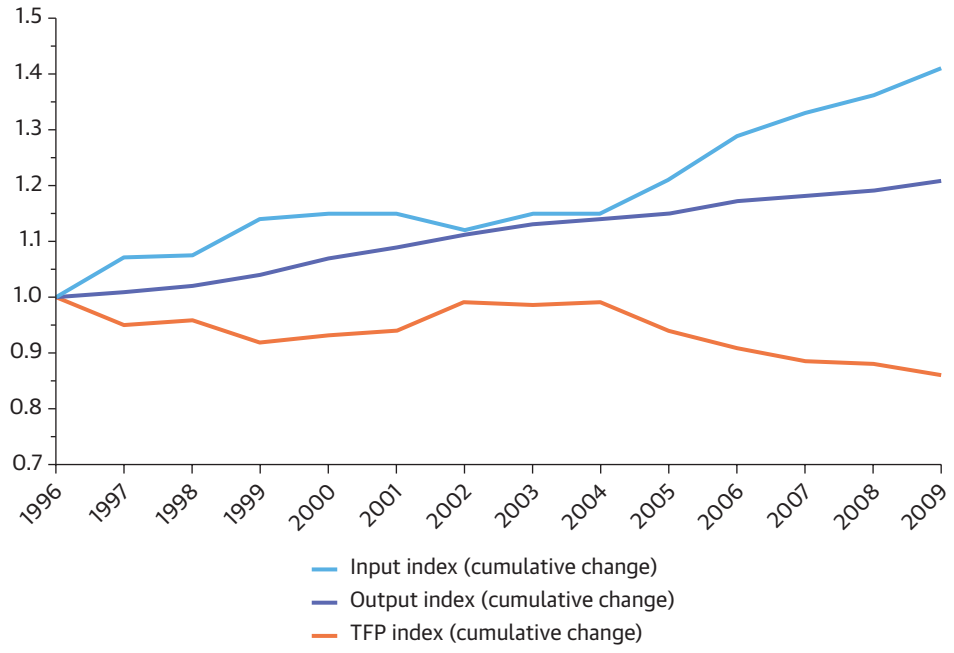
In the three years to 1995/96, SWC reduced employee numbers by over a third (from 8,269 to 5,369).

1996-2009

IPART undertook a thorough review of the productivity performance and influencing factors in its *Review of the Productivity Performance of State Owned Corporations* (2010). For HWC and SWC, it covered the period 1996-2009 and examined the efficiency of these utilities through (a) estimates of TFP; (b) separate estimates of capital and labor productivity; and (c) comparisons of the performance of HWC and SWC with their peers, based on partial performance indicators of cost and quality of services.

Productivity is the ratio of outputs to inputs and is a narrow measure of efficiency. Typically, a business will seek to improve productivity by improving the quality and utilization of its capital, labor force and other inputs. Better processes within the business and

FIGURE 15.12. Productivity and Cost Trends, Sydney Water Corporation, 1996–2009



Source: IPART 2010.
Note: TFP = total factor productivity.

more flexibility in the use of resources can be an important component of improving productivity.

As capital inputs can be lumpy, the position in the asset cycle is critical. These are asset-intensive industries with long-lived assets. Arguably, in the 1990s the utilities lived off aging assets, many of which are now coming up to replacement. This inevitably results in a decline in measured productivity. The benefits of asset investment in providing services in future periods are not considered in productivity measurement. Figure 15.12 shows the trend in productivity since 1996 for SWC. However, this measure is not adjusted for improving quality, and therefore understates true productivity performance.

In regard to performance measured by TFP, IPART concluded that SWC's TFP declined over the period. When inputs include the opportunity cost of capital component, its TFP fell by 14.5 percent. HWC's TFP increased by 0.9 percent, since its output growth just outpaced the growth in its inputs. The dominant drivers of the urban water corporations' TFP outcomes were the increases in their asset bases and HWC's efficiency gains in the first half of the period. HWC's TFP increased by 21.3 percent up to 2004, but significant increases in its CAPEX (which increased its asset base by 52 percent between 2004 and 2009) led to productivity being almost unchanged overall by 2009. Finally, SWC's output growth largely matched input growth between 1996 and 2004, but significant increases in CAPEX (resulting in a 49 percent increase in its asset base between 2004 and 2009) led to an overall productivity decline by the end of the period (IPART 2010).

When this was disaggregated, the trends in labor and capital productivity were markedly different. IPART found that SWC's staff labor productivity increased by 90 percent over the period. This increase was partly due to reductions in labor input following the separation of bulk water functions from SWC and creation of the SCA in 1998, as well as some shifting of load to consultants and contractors between 1996 and 2001. However, from 2001 to 2009, SWC's staff labor productivity increased by around 26 percent with no further apparent shifting of load. HWC's staff labor productivity increased by 103 percent over the period,

mainly due a 20 percent reduction in staff positions coupled with increasing outputs. Substitution of consultants and contractors for staff labor also occurred, reflecting the formation of the corporation's subsidiary, Hunter Water Australia Pty. Ltd., in 1998 and the contracting back of services (IPART 2010).

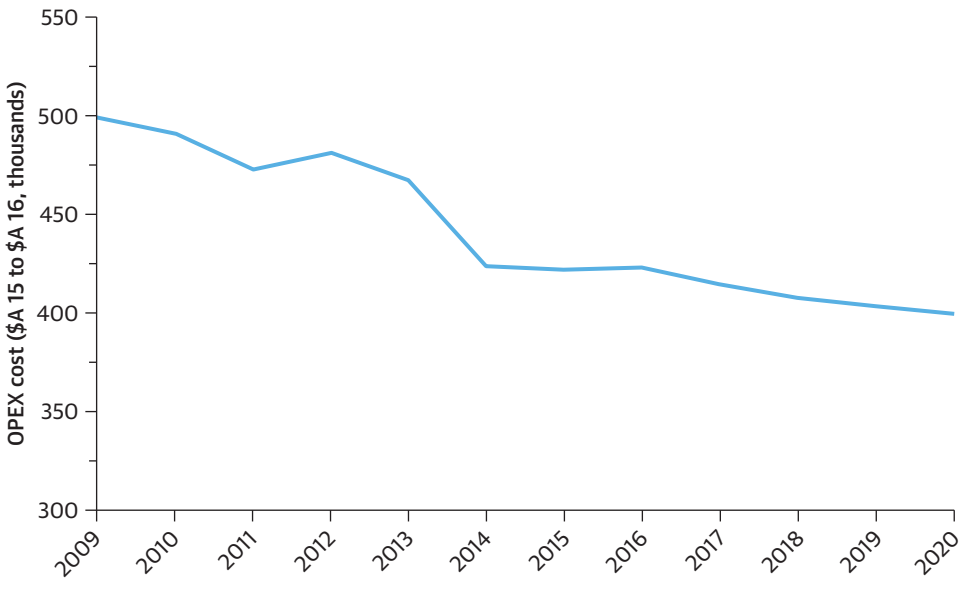
However, capital productivity declined for both utilities over the 2001-2009 period. HWC's capital productivity fell by 14.5 percent over the period, while SWC's fell by 24 percent. For both corporations, there was a marked decrease in capital productivity between 2003/04 and 2008/09, reflecting the increases in their asset bases. This was driven by the significant quality-related investments. The large reduction in capital productivity reflected the investment in the SDP to improve the long-term security of supply (IPART 2010).

IPART also compared SWC's and HWC's performance against a range of cost and output indicators in the National Performance Report for Urban Water Utilities (NPR) in Australia and New Zealand with more than 100,000 customers over the period 2004-09. The interpretation of these indicators needs to bear in mind their partial nature, the impact of many other factors not captured in the simple ratios used, and the remaining questions about the reliability of the NPR data. Nonetheless, SWC and HWC performed well against their peers on most measures used in the comparison.

2009-20

Recent partial performance indicators show strong improvement. Figure 15.13 shows the steady decline in operating costs (excluding costs of purchasing bulk water) since 2010. SWC's most recent price proposal projects this to continue through to 2020.

FIGURE 15.13. Underlying Operating Expenditure per Property (in Real Terms)



Source: SWC 2015, p10.
Note: OPEX = operating expenses.

Benchmarking on OPEX per property and similar measures shows SWC has improved relative to its peers and is second to Melbourne Water. Table 15.2 compares SWC's operating cost (water and sewerage) per property with other large (greater than 100,000 customers) urban water businesses. Operating costs per property for SWC and HWC are below average and well below the operating costs for the Victorian and Queensland businesses.

TABLE 15.2. Operating Cost (Water and Sewerage) per Property, 2010-11 to 2014-15 (Australian $/Property)

	2010-11	2011-12	2012-13	2013-14	2014-15
Sydney Water	633	659	687	676	664
Hunter Water	562	548	618	579	623
City West Water	810	953	914	1,206	1,080
Yarra Valley Water	608	741	717	953	859
South East Water	664	774	724	983	862
Gold Coast			1,011	1,103	1,149
Qld Urban Utilities	791	899	1,032	1,132	1,135
Logan			988	1,064	1,079
Unitywater	871	946	936	981	974
WC (Perth)	508	545	579	595	579
Barwon Water	655	712	623	639	597
SA Water				708	661
Icon Water	769	840	810	753	764

Source: BOM National Performance Reporting, Database 2014-15.

SWC also produced estimates of its current and projected TFP over the three years to 20015-16 (the regulatory period just ended), using its forecast costs for 2015-16. This showed a projected improvement in the TFP of 5.4 percent over the period.

Notes

1. This discussion is based on material in Barkatullah (1999).
2. The SCA is now known as WaterNSW.
3. The rate of return is a real rate of return as it does not include the capital gain through the indexation of the asset base.
4. These issues are discussed specifically in the context of the measurement of performance of SOCs and in more detail in IPART (2010).

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Chapter 16 Concluding Comments

16.1. Drivers for Reform

Reform is challenging: to be successful it often requires a crisis to focus attention and effort, and a mix of push factors (external drivers) and pull factors (such as internal drivers and early movers demonstrating improvements). The importance of these individual reform champions and the strength of political commitment should not be underestimated.

The early reforms in Hunter Water Corporation (HWC) reflected both a crisis (the severe inefficiency and antiquated systems in place) and the importance of a change agent. Critical to the reform process were the new head of the organization, Dr. John Paterson, and executives with very strong capabilities and drive to push through resistance.

The crisis that drove the National Competition Policy (NCP) was somewhat more amorphous: a slow productivity growth and comparative economic decline. Some sectors had more immediate crises. In electricity it was the extent of excess generation capacity; in rural it was the problematic salinity and the tension between environmental and agricultural uses for the scarce water resources in the Murray-Darling Basin. Arguably, this helps explain the variable success and pace of reform. The other important factor encouraging reform was the strong commitment to the reform of the Commonwealth and key state governments. The creation of new federal (joint commonwealth-state) bodies and the Productivity Commission, a well-regarded advisory body with a degree of independence and a strong focus on economic reforms, assisted in guiding the reform process.

16.2. Role of the Commonwealth Government

The commonwealth government is a key external driver for the state and local governments, who are responsible for the delivery of urban water services. The Hilmer Report and subsequent NCP recognized the importance of more efficient provision and use of infrastructure to improve national productivity and growth. The preferred means of achieving this (promoting competition through access to essential facilities and limiting the scope of the monopoly) have been more effective in other sectors such as electricity. However, the national framework for improving the governance of the sector has been important in guiding and reinforcing the reform of the sector, particularly in improving its financial sustainability and efficiency and the pricing of its services. The system of national competition payments was effective in encouraging the states to agree to and implement the reforms, and to reinforce preexisting reforms. Important aspects of this were the long tradition in Australian federalism of conditional grants, and the creation of an arm's length agency to review and assess compliance and advise on payments.

While this paper has focused on urban water reform in New South Wales, the commonwealth government's leadership has been stronger in rural water. The water basins for the major urban areas in New South Wales are wholly within the state. In contrast, the key rural

water basin (the Murray-Darling Basin) covers a huge area across the states of Queensland, New South Wales, Victoria and South Australia, and the need for national coordination of this resource was more immediate and obvious.

16.3. Role of the State Governments: Leading and Implementing

Much of the task of implementing the reforms in the urban water sector has fallen to the state governments as the service providers. Some states and utilities led the implementation of the reform agenda, whereas in other states the NCP and national water reform agenda were an important impetus to reform. New South Wales and Victoria were early implementers of many of the reforms (such as commercialization and price reform) subsequently built into the urban reform agenda under the NCP. The driver in both cases was an immediate budget crisis at the state level, with reform supported by the strong commitment of newly elected reformist governments. Even within New South Wales, HWC led the reforms, being corporatized and embarking on substantial price reforms in advance of the NCP. Although the policy commitments in regard to Sydney Water Corporation (SWC) were entered into before the NCP, arguably the NCP reinforced the commitment to and implementation of those reforms.

16.4. Role of the Regulator and Regulation

Independent, transparent regulation has been an important part of the reform; prices have become more efficient and cost-reflective, and over time returns in the sector have improved. By setting a hard budget constraint, the incentives to improve efficiency were strengthened. However, achievement of efficiency gains depends on governance and the quality of management, not just incentives.

One of the important lessons from the path of regulation in New South Wales is that reform takes time and patience; not all problems can be addressed simultaneously. The initial focus was on setting tough efficiency targets and using the efficiency dividend to facilitate substantial tariff reform and removal of cross-subsidies. In the last 15 years the financial framework has become more rigorous, and allowed rates of return have been lifted.

The other key issue the reform experience raises is the interface between regulation and policy and the meaning of independent regulation. First, sound sustainable regulatory regimes need to provide a safety valve for political intervention to ensure broader policy objectives are achieved; the mechanism should be structured to ensure the transparency and time consistency of such interventions. The New South Wales regime does this by allowing scope for the government to commission special reviews and provide public terms of reference and transparent directions. Second, independence is not inconsistent with deference to transparent, properly made policies of government. Elected governments are accountable to the community in a way that appointed regulators are not, and it is appropriate that the regulatory body have regard to the government's public policy position even where it does not agree with those policies, such as in the removal of developer charges.

16.5. Promoting Efficient Provision of Services and Use of Resources

The framework for improving performance has revolved around (a) a clearer policy and operating framework for the sector; (b) clear commercial objectives for the service providers aligned to the framework; (c) sector restructuring, a stronger role for the private sector, and facilitation of competition; and (d) depoliticization and reform of pricing and its regulation. Conceptually, this is a coherent package that strengthens the incentives of service providers and aligns these to the objectives for the sector. Some aspects of improvement, such as the removal of cross-subsidies can be more measured and linked to regulation. Others are more difficult, such as productivity improvement where it is difficult to include quality improvements and the impact of capital cycles. However, the AWA concluded that:

> What had been a heavily subsidised industry, under the control of disparate local governments—either directly or through their participation on governing boards—has become a competitive, financially secure industry, under the management of skilled boards and which prices its services to recover its costs and achieve a return on investment. Furthermore, these reforms and others have led to a rationalisation in water use, and a highly strategic approach to asset management that has reduced maintenance, improved asset life and reduced service interruptions. Environment protection and water quality has also improved significantly. (AWA 2010)

Annex 16A—IPART's Approach to Setting Revenues and Prices

IPART's Current Approach to Setting the Annual Revenue Requirement

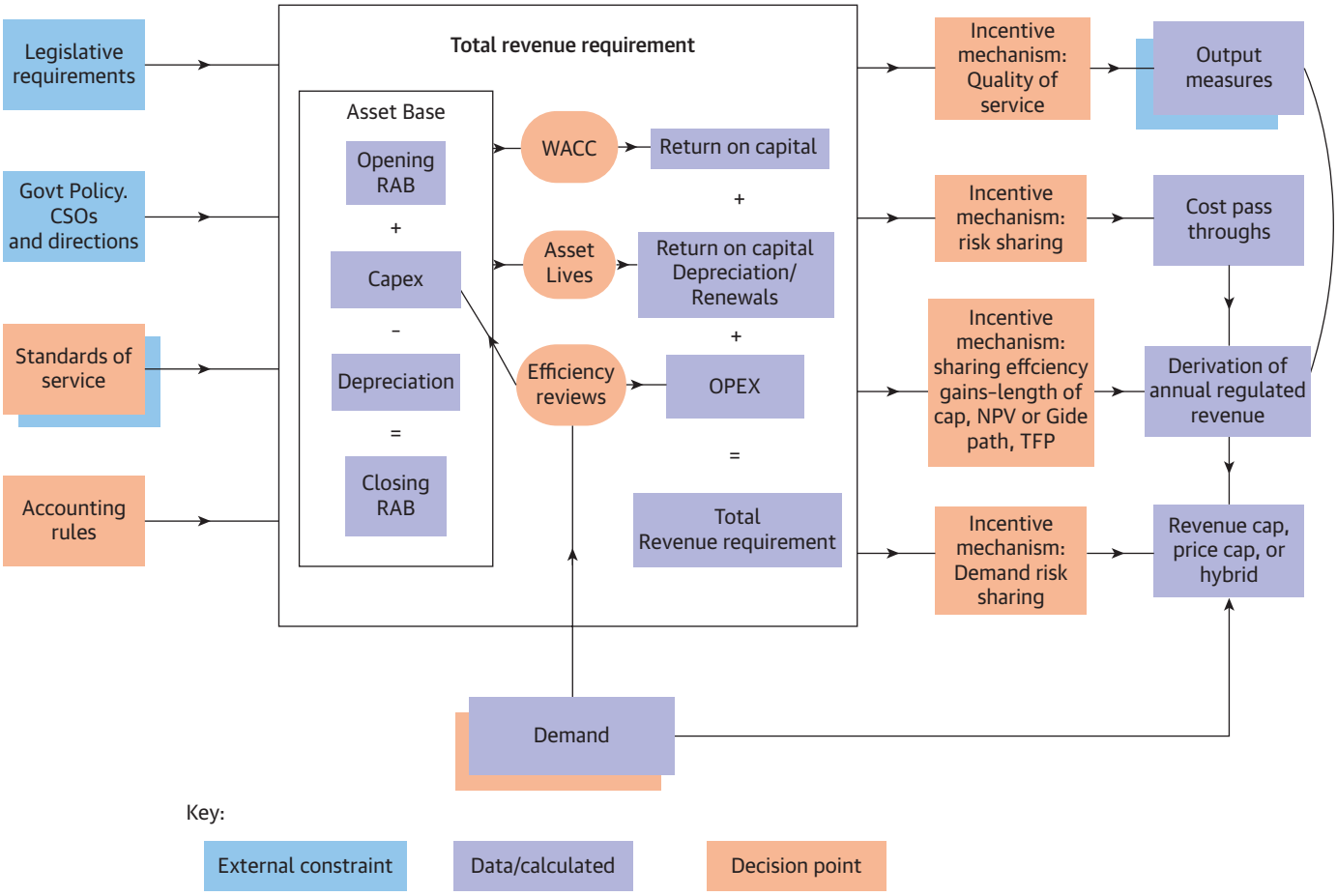
For its first two determinations, IPART used a cash flow approach focusing on the adequacy of cash flows to cover efficient operating expenses (OPEX) and a reasonable level of internal funding of efficient capital expenses (CAPEX). The adequacy of the profit margin was assessed in terms of benchmark margins and free cash flows rather than returns on assets. From its 2000 determination, IPART has explicitly used a building block approach to determine regulated revenues in which

> Annual revenue requirement (ARR) = OPEX + depreciation + return on assets (ROA).

Once the regulated revenues are determined, prices are set in accordance with the designated approach so that, for the forecast customer numbers and volumes of water and wastewater, expected revenues equal the ARR. Figure 16A.1 summarises this approach.

The allowance for OPEX is based on an assessment of the efficient OPEX. Depreciation is a function of the regulatory asset base (RAB) and the assumed asset lives, and the ROA is a function of the RAB and the allowed rate of return (ROR). The RAB is in turn a function of the initial RAB and efficient CAPEX and any revaluation adjustments. This approach aligns well with financial and accounting perspectives of businesses, and includes a profit margin

FIGURE 16A.1. Overview of the Determination of Regulated Revenues or Average Prices



Source: Author.

that is based on allowed rate of return on the RAB. This approach is better understood, provides clearer investment incentives, and is considered to provide greater long-term certainty. The key decision points for the regulator under the building block approach are the following:

- Setting of the initial RAB
- Methodology for rolling the RAB forward between reviews
- Assumed asset lives
- Allowed ROR (weighted average cost of capital [WACC])
- Assessment of the efficient levels of CAPEX and OPEX

This approach, which developed through IPART's earlier decisions and has been implemented in the determinations from 2000, is consistent with the National Water Pricing Principles adopted in 2004.

Asset Valuation

Setting of the Initial RAB

There are four basic approaches to calculating initial regulatory asset base (RAB): (a) depreciated historic cost, (b) depreciated indexed historic cost, (c) depreciated optimized replacement cost (DORC), and (d) discounted cash flow. Depreciated historic cost and indexed historic costs were not feasible due to gaps in the asset acquisition values records given past public sector accounting requirements, changes in accounting systems, and changes in the sector structure.

Following commercialization and corporatization, New South Wales businesses had adopted replacement cost accounting and the New South Wales Treasury had pushed for a DORC asset value. From the mid-1990s, there was broad support from utilities, policy makers, and some regulators to adopt DORC asset values. Part of this support was driven by the view that DORC values were a better approximation of the economic value, although as Prof. Stephen King (King 1995; Reid and Choy 1996) argued, the economic value of an asset can be anywhere between its replacement cost and its scrap value. While there are strong precedents for the use of replacement cost values based on a theoretical optimal network in South America, this level of optimization was far greater than that proposed in Australia. Optimizations in Australia start from the existing networks, not a hypothetical greenfield network, and test for the existence of excess capacity. Furthermore, the use of depreciated optimized replacement cost (DORC) values was not supported by the precedents in U.K. electricity and water from which the Australian approach was derived. In the United Kingdom, the RAB has been based on valuation of the businesses in the first 100 days of trading. This is akin to the discounted cash flow method, since the market value should reflect the expected value of future earnings discounted to today's values.

IPART resisted the pressure to adopt the DORC approach to asset valuation, since it was concerned about the uncertainty in asset valuations and its sensitivity to planning assumptions (which impact the extent of optimization). IPART also held concerns regarding unsustainable increases if prices were based on DORC plus a commercial return. However, IPART noted that historic cost estimates were not available.

IPART did not lock-in an asset value until 2000 when it set the RAB using the discounted cash flow (i.e., the asset value that would be supported by the current and projected cash flows). IPART considered that this would provide a way of locking in a RAB for the future, while minimizing price shocks. IPART recognized that this has an element of circularity, since it requires assumptions about future prices. Interestingly, since then there has been a more general move away from the DORC values. While the electricity network assets were initially valued at the DORC, the rules[1] were changed to remove future DORC revaluations. Instead, the initial RAB is rolled forward with indexation for the general change in prices (Consumer Price Index, CPI) only. The water pricing principles agreed in 2004 recognized that DORC set a maximum value only.

Roll-Forward of the RAB

Having set the initial RAB, IPART set the basis for its revaluation and the roll forward of the RAB. It adopted the approach of indexing the RAB by a general measure of inflation, the CPI. This preserves the value of financial investment in the entity in real terms, and is consistent with the accounting principle of financial capital maintenance (FCM).[2] The approach to regulation adopted by IPART consistently adopts the FCM view.

The RAB at the start of a regulatory period is rolled forward using the following formula for each year of the previous regulatory period (Box 16A.1):

$$\text{Opening RAB}_{yr\,1} = (\text{Closing RAB}_{yr\,0})(1+\Delta\text{CPI}) + (\text{CAPEX} - \text{Depreciation} - \text{Disposals})(1+\Delta\text{CPI}/2) \quad (16A.1)$$

BOX 16A.1. Steps in Setting Water, Wastewater, and Stormwater Prices

Allocate costs to major business functions: water supply, wastewater, tradewaste, stormwater.

For water:

- Estimate LRMC of water supply
- Set usage charge on basis of LRMC. Same usage charge applies to all customers
- Fixed charge set to recover residual costs allocated to water (varies according to meter size, to reflect potential demand on system)

For wastewater:

- Allocate costs between residential and nonresidential customers
- Set a standard fixed charge for households (difference between houses and apartments has been phased out)
- Set discharge charge for nonresidential customers based on estimate of marginal cost
- Apply discharge charge as a function of water consumption and discharge factor
- Fixed charge set to recover residual nonresidential wastewater costs

For stormwater:

- Set a charge on property size (per m^2) to recover costs allocated to stormwater

For tradewaste:

- Model impact of specific nonstandard discharges on costs
- Set charge per unit of nonstandard discharge to recover costs allocated to tradewaste

Where:

- CAPEX is actual CAPEX, subject to an assessment of the efficiency of the CAPEX,
- depreciation uses actual CAPEX, exclusive of any adjustment for inefficiency,
- CAPEX and depreciation are assumed to occur evenly through the year, hence the allowance for half the rate of inflation.

The same formula is used in rolling forward the forecast RAB for the regulatory period. However, in this case CAPEX is the forecast efficient CAPEX, and depreciation is calculated using forecast efficient CAPEX.

Asset Lives

Assumed asset lives have not been a contentious component of the determination of the ARR. The asset life assumptions are based on assessments of the average economic life for different classes of assets. The water utilities have proposed changes to asset lives at price reviews, and these have largely been accepted by IPART. The key point to note is that changes in asset lives affect the time profile of the revenue stream, but not the net present value of revenues over the life of the assets. Shortening the asset life will increase prices in the early years but result in lower prices in later years.

Allowed ROR

Since allowance for inflation is incorporated through the indexation of the RAB, IPART uses a real ROR. It has used the WACC approach using a benchmark gearing of 60:40 debt to equity; a benchmark cost of debt based on the cost of debt for BBB/BBB+ rated company; and a benchmark ROE using the capital asset pricing model (CAPM).

Until the latest (2016) price review, the allowed ROR has been the most consistently contentious element in the determination of prices. Initially the utilities were concerned (with some justification) that the WACC was too low. There were a number of factors that led to these concerns:

- Assumed maturity period (five years) for the risk-free rate, which was the starting point for the cost of debt and ROE
- Market benchmarks used for the estimation of the cost of debt and inflation expectations
- Relatively low ROE compared to debt and the returns allowed for the electricity utilities

Over time, IPART has improved the rigor and transparency of the approach adopted and increased the internal consistency of the WACC parameters by using short- and long-term averages for the various WACC parameters on a consistent basis. In addition, it has deepened the analysis of benchmarks for the cost of debt and equity beta and incorporated current market data more systematically in determining the WACC. Finally, it has signaled that

it will more consistently set the WACC at the midpoint of its best estimate of the WACC. Two key points are that the ROE is now estimated using an equity beta[3] that is the same as that used for electricity networks in Australia. The same approach is used to setting the WACC for the government-owned water utilities and the privately owned Sydney Desalination Plant (SDP).

Estimation of Efficient OPEX and CAPEX

Since adopting the building block approach, IPART has engaged major engineering and management consulting firms to review the efficiency of forecast OPEX and CAPEX for the next regulatory period and CAPEX in the previous regulatory period. The approach assessing OPEX has developed to, first, estimate a step-change for catchup efficiency based on an assessment of the efficiency of each of the water utilities compared to its peers, using high level benchmarks (e.g., OPEX per customer) and a review of the efficiency of major components of OPEX. Second, estimate a trending rate of change in productivity for the sector. Third, consider specific factors, such as increases in unit costs beyond the control of the utility, and changes in outputs (volume of water and customers served) and service and environmental standards. The CAPEX assessment focuses on reviewing the quality of the planning and decision-making processes, as well as reviewing major projects and programs and a sample of minor projects and programs. The assumed efficiency improvements in the reviews from 2003 have been significantly below those in earlier determinations, and in the last regulatory period (2012-16) SWC achieved greater efficiency improvements than were expected in the determination.

IPART's Current Approach to Setting Tariff Structures

IPART's approach to setting prices consistent with the determined ARR is outlined in box 16A.1. The key objectives that guide this approach are that (a) usage prices should reflect the relevant marginal costs to provide appropriate signals for water usage and discharges; (b) customers pay their fair share of the total costs of supply and there are no cross-subsidies; and (c) customers who place the same demand on the system face the same or similar total bill.

Allocation of Costs to Services

The urban water suppliers provide four different services: (a) supply of water, (b) removal and treatment of standard discharges, (c) management of stormwater flows, and (d) removal and treatment of nonstandard discharges ("tradewaste"). Except for head office and information technology (IT) assets, the assets used for water supply, wastewater, and stormwater are largely separate from each other and easily identifiable. Furthermore, most of the costs are either asset-related costs (depreciation and ROA) or OPEX costs that are asset driven. This has meant that the allocation of costs between water, wastewater, and stormwater has been noncontroversial and IPART has accepted the allocations proposed by SWC and HWC.

Tradewaste consists of wastes that are substantially different in composition from normal waste, and impose additional costs of treatment and management to normal waste. Examples include waste from food processing plants that have a higher biological oxygen demand and wastes from specialized processing plants, even as small as dry cleaners, containing higher concentrations of chemicals. Since the same assets handle tradewaste and normal wastewater, the identification of the costs of tradewaste has involved modeling of the differences in costs of management, treatment, and asset maintenance for tradewaste discharges compared to normal discharges. One exception to this is the extent to which stormwater infiltrates the wastewater system, causing overflows during major storm events. This led IPART to take the view that the capacity of the sewerage system is driven by peak flows in storm events, not by normal effluent levels outside these events.

Water Charges

The first step in setting water charges has been to estimate the LRMC of the supply of the water. The LRMC will depend on the current and projected supply and demand balance and the timing and cost of supply augmentation. The incremental costs of meeting additional demand are the costs of additional bulk water supply common to all customers within the service territory of each utility. Hence, in principle, the LRMC is similar for all customers.[4]

Given the uncertainties and the different methods used in the calculation of the LRMC,[5] there can be quite a large range in the estimates of the LRMC. In the latest review, IPART's estimates of the LRMC ranged from $A 1.11 per kL to $A 1.62 per kL while SWC's estimates ranged from $A 1.18 per kL to $A 2.68 per kL. These estimates were significantly lower than previous estimates of the LRMC, since the need for the next augmentation had been pushed further into the future with the reduction in per capita water use and the construction of the SDP.

The second step in setting water charges is to set the usage rate, which applies to all customers. From its first determination, IPART had increased the usage charges to reflect the estimated LRMC. This had initially been controversial but there was now strong community support for "user pays." Water was seen to be a valuable, scarce commodity and customers appreciated the sense of control over their bill gained by paying for water on the basis of usage rather than fixed charges. In the 2016 price review, SWC argued that the usage charge should be reduced by a smaller amount (from $A 2.28 kL to $A 1.97 kL) than the reduction in the estimated LRMC. First, there was considerable uncertainty in the estimation of LRMC and $A 1.97 kL was still within a reasonable range for the estimation of LRMC. Second, customers make long-term decisions to improve water efficiency through investments in appliances and equipment and redesign of production processes, and greater consistency of prices through time would support more efficient decision-making by consumers. Finally, consumer research showed strong support for continuing usage charges at previous levels, rather than switching to lower usage charges and higher fixed charges. IPART's decision to accept SWC's proposal indicated that LRMC is not an absolute or certain pricing rule and that customer preferences should also be considered.

The third step in setting water charges calculates the revenue to be raised through fixed charges (service charges). Once the usage charge is determined, the revenue raised is estimated based on forecast water demand. This revenue is deducted from the total costs allocated to the provision of water services to then determine the revenue to be raised from fixed charges.

The service charge for each customer (residential and nonresidential) is set with reference to the standard 20 mm residential meter: all residential customers are assumed to be connected using a 20 mm meter. Fixed charges for nonresidential customers connected with a 20 mm meter are the same as for residential customers. The fixed charges for nonresidential customers connected using larger meters are set by the ratio of the cross-section areas of the pipes. That is, the charge for a customer connected with a 50 mm meter is 6.25 times that for a 20 mm connection.[6]

The fixed charge per customer is then set in the fourth and final step. The fixed charge for the standard 20mm connection (and hence all other fixed charges for water service) is calculated so that the revenue from all fixed charges from all customers equals the residual revenue to be collected as per step 3.

Wastewater Charges

The wastewater charges are set in a similar manner to water charges except that costs for residential customers are recovered through a fixed charge only, and whether usage charges for nonresidential customers should be based on short-run or long-run marginal costs has been a matter of debate. For residential customers, usage charges are not considered feasible, hence a fixed charge is used to recover the costs of these customers. Previously, the fixed charges for customers in multidwelling premises were lower than for those in stand-alone dwellings. However, the charge is now the same for all residential customers, based on the argument that average loads vary according to the size of the household rather than the type of dwelling.

Nonresidential customer costs are recovered through a fixed charge and a usage charge. Unless discharges are measured, wastewater volumes are estimated based on a discharge factor applied to the amount of water consumed. The standard discharge factor is 78 percent (i.e., discharges are 78 percent of water consumed), but customers can apply for nonstandard discharge factors based on the nature of their production process and their use of water.

Current usage charges ($A 1.10 per kL for SWC) reflect the estimated LRMC. In its review of pricing principles (IPART 2012), IPART had proposed that short-run marginal costs provide the better price signal and that usage charges should transition to the estimated SRMC ($A 0.25 per kL to $A 0.30 per kL for SWC). There were two arguments to support this. First, there is significant stormwater infiltration of the sewer system during major storms, and the capital costs are substantially driven by these peak loads during storms rather than wastewater discharges in normal periods. Second, IPART argued that the LRMC varied substantially between different wastewater drainage basins within the service areas of SWC and

HWC. Hence, a single wastewater charge based on the LRMC would understate the true LRMC in some areas and overstate it in others. These points were contested by SWC and HWC, and customers expressed concern about the possible impact of the large reduction in usage charges and a consequent large increase in fixed charges. As a result, IPART has not enforced the transition to SRMC and is going to undertake a further review of the issue.

The fixed charge for a nonresidential customer with a 20 mm meter is the same as the fixed charge for a residential customer on a standard 20 mm meter, and includes a discharge allowance of 150 kL pa. Fixed charges and discharge allowances for customers on larger meters are pro-rated based on the ratio of the cross-sectional area of the connecting pipes.

Stormwater Charges

There are many variables that affect the stormwater run-off from a property and hence the costs it imposes. These include the size of the property, the proportion of nonpermeable surfaces, the slope of the property, and the receiving basins and waters. Initially, stormwater was charged on a simple per customer basis. This created an inequity whereby a small flat was charged the same as a much larger house that created a larger run-off and larger load on the stormwater system. Hence, IPART has moved to a system of charging on the basis of property area for nonresidential customers. This is still an imperfect system as it captures only one of the many factors that impact stormwater loads. However, IPART has provided for a new category of low impact customers that are charged the same rate as medium-sized customers. Residential customers are not charged directly on the property area, but the fixed charge per dwelling for multidwelling premises (e.g., apartments, town houses) is lower than that for stand-alone houses based on the lower average property size and impervious surfaces per dwelling.

Tradewaste Charges

The tradewaste charges are based on the measured composition and volumes of tradewaste from businesses that are assessed to have discharges substantially different from the normal composition. Cost models have been developed that assess the impact on costs of specific elements in the components of the waste (such as specific metals that are difficult to treat or dispose of, or biological oxygen demand that affects treatment and asset maintenance costs). From this, a charge scale for these components is established, and tradewaste customers are charged on the basis of this scale and the composition of their waste.

The cost model and charging scale was initially controversial, and IPART required SWC to engage with their tradewaste customers on the proposed charging scale. SWC was very transparent on the basis of their costs models, walking customers through the effect of different types of waste on SWC's costs and how this was translated into the charges. In response to input from customers, SWC modified some of the proposed charges. This process of engagement increased the level of understanding and ensured the resulting acceptance of the proposed charges.

Notes

1. These rules are set through a federal process, not by the regulators. The Australian Energy Market Commission (an independent body) advises the state and commonwealth ministers on changes to the rules that govern the operation of the energy market and regulation of networks.
2. In contrast, the depreciated optimized replacement cost is consistent with the principle of operating capability maintenance.
3. Under CAPM, the return on equity = the risk-free rate + (the market risk premium X the equity beta), in which the equity beta is a measure of relative systematic risk.
4. Pumping costs and incremental distribution costs may vary between regions, but there is strong support from the community and government for postage stamp pricing (i.e., the same price applies across the service territory of a utility).
5. The two most common methods are average incremental costs and the Turvey perturbation method. Depending on the supply and demand balance, the difference in the estimates using these two methods can be quite large.
6. Ratio $50^2/20^2 = 6.25$.

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Appendix A Key Water Sector Interviewees in the Research

TABLE A.1. Interviewees

Key informant	Chief former roles
Leith Boully	Director, Seqwater
	Commissioner, National Water Commission
John Bradley	CEO, Queensland Water Commission
	Director-general, Queensland Department of Environment & Resource Management
Shaun Cox	CEO, Melbourne Water
	CEO, Gold Coast Water
	Director, Water Services Association of Australia
Chris Davis	CEO, Australian Water Association
	Commissioner, National Water Commission
David Evans	CEO, SWC
	CEO, HWC
Dr. Jim Gill	CEO, Water Corporation of Western Australia
Prof. John Langford	CEO, Water Services Association of Australia
	Commissioner, Murray-Darling Basin Commission
	Managing Director, Victoria Rural Water Corporation
Garry Law	Manager, Brisbane Water
Mark Pascoe	Manager Water and Sewerage, Brisbane City Council (1997–2002), Chair, Queensland Water Minister's Expert Panel for Water.
	President, Australian Water Association
Prof. Rob Skinner	CEO, Melbourne Water
	Chair, WaterAid
	Director, Water Services Association of Australia
Rick Stankiewicz	Director (Water), QCA

Note: HWC = Hunter Water Corporation; QCA = Queensland Competition Authority; SWC = Sydney Water Corporation.

Appendix B Reform Timelines for National, State, and Utility Levels

TABLE B.1. Reform Timelines for National, State, and Utility Levels, Australia

Year	National	State	Utility
1978			Two-part tariff (with water allowance): Perth Water Board (Western Australia)
1982			"User pays" pricing (water allowance removed): Hunter District Water Board (New South Wales)
1986			"User pays" pricing: Melbourne and Metropolitan Board of Works (Victoria)
1987			"User pays" pricing: Sydney Water Board (New South Wales)
1992	COAG formed	ESC established (Victoria)	Hunter Water corporatized (New South Wales)
	Industry Commission inquiry of water resources and wastewater disposal	IPART established (New South Wales)	Melbourne Water corporatized (Victoria)
	Murray Darling Basin Agreement		
1993	Hilmer Committee NCP report		
	Working Group on Water Resource Policy report		
1994	COAG water reform policy framework		"User pays" pricing: Australian Capital Territory Electricity and Water Authority
1995	COAG adopted NCP package		ACTEW Corporation corporatized (Australian Capital Territory)
			SA Water corporatized (South Australia)
			SWC corporatized (New South Wales)
			"User pays" pricing: SA Water (South Australia)
1996	Australian Drinking Water Guidelines		Water Corporation corporatized (Western Australia)
1997		ICRC established (Australian Capital Territory)	"User pays" pricing: Brisbane Water (Queensland)

table continues next page

TABLE B.1. continued

Year	National	State	Utility
1998	National Water Quality Management Strategy	Integrated natural resource management and planning processes initiated (1998 to present)	
2000		Queensland Competition Authority assumes water pricing regulation responsibility (Queensland)	
		Utilities Commission established (Northern Territory)	
2002			Power and Water Corporation corporatized (Northern Territory)
		ERA established (Western Australia)	
2004	NWI		
2005	NWC established		
2006	Australian Water Recycling Guidelines	Queensland Water Commission established (Queensland)	
2007	Water Act		
2008	COAG updated national urban water reform framework		Regional Water and Sewerage Corporations corporatized (Tasmania)
2010			Brisbane Water restructured into Queensland Urban Utilities (Queensland)
2012		ESCOSA assumes water pricing regulation responsibility (South Australia)	
		Tasmanian Economic Regulator assumes water pricing regulation responsibility (Tasmania)	

Note: COAG = Council of Australian Governments; ESCOSA = Essential Services Commission of South Australia; ERA = Economic Regulation Authority; ESC = Essential Services Commission; ICRC = Independent Competition and Regulatory Commission; IPART = Independent Pricing and Regulatory Tribunal; NCP = National Competition Policy; NWI = National Water Initiative; NWC = National Water Commission; SWC = Sydney Water Corporation.

Appendix C Literature Summary

A key stage in the research leading to this report was to conduct a thorough literature review related to Australia's urban water reform process. The aim was twofold: to (a) fill gaps in the current knowledge base, and (b) help inform the direction and scope of stakeholder interviews in the next stage of the research.

Searches of the literature yielded significant amounts of material on approaches to improve the economic return on public investment in water supply systems including efficiency reforms in line with national competition policy initiatives (see Horne 2013; LECG 2011; Productivity Commission 2011). Similarly, the last decade has seen an outpouring of material on government and utility responses to the critical issue of changing climatic conditions, observed keenly during the Millennium Drought period (see Head 2014; Marsden and Pickering 2006; Troy 2008; van Dijk et al. 2013; Wittwer 2013).

An emerging body of literature discusses the urban water sector's contemporary approaches to, or sometimes institutional barriers to, integrated urban water management and water-sensitive urban design: a next phase of the reform movement (see Brown and Farrelly 2009; Choi and McIlrath 2016; McCallum and Boulot 2015). In addition, a considerable body of "gray" literature has been produced by or on behalf of government departments and agencies to document the water reform process and aspects of water utilities' performance (see BOM 2016; DPMC 2007; NWC 2006; NWC 2014b).

However, little contemporary scholarly work has been dedicated to a longitudinal account of the progression of urban water reforms in Australia, with the exception of a few historical analyses of large-scale utility expansions or regional adaptations to reform initiatives (see Abbott et al. 2011; Crase et al. 2000; Lloyd et al. 1992), and critical interpretations of localized planning or infrastructure developments in response to increasing population density and resource demand (see Davis and Farrelly 2009; Evans 1994; NWC 2012).

A key focus of much of the existing literature discusses how the governance and institutional changes during the 1980s-90s reform era influenced the development of water policy and the restructuring of utilities and the sector. Largely, this literature frames the reforms as positive and the changes as successful (see Abbott et al. 2011; Berg 2014; Saleth and Dinar 2005). However, in the last two decades, reports have been published that depict some of the reform efforts as counterproductive (in terms of price stabilization, demand management, or social cost), or not quite as influential in refashioning water management or water use as most studies depict (see Quiggin 2007; Sheil 2000; Syme 2008).

Another divide in the literature is an emphasis on particular targets of the reforms, in which many accounts typically are couched in terms of economic outcomes or efficiency dividends (see Abbott et al. 2011; Carroll and Head 2010; Grafton et al. 2015). This reflects an early and very important focus of the reform process, as water agencies and utilities—especially those major urban utilities in the economic reform vanguard of New South Wales and Victoria—responded to (or in some respects inspired) the national

competition and corporatization agendas. More recently, the literature emphasis has altered somewhat to incorporate considerations of "public good" outcomes, and attempt to accentuate social, environmental, and sustainability results or benefits that have derived from the reforms (see AWA 2016; Crase 2008; Johnson and Rix 1993; Kaspura 2006).

A noticeable absence in the literature is close analysis of the implementation and impact of the reform process in separate Australian states and territories, save for a handful of case studies that tend to focus on the responses of particular regions or cities or urban utilities to policy "stresses," or on policy initiatives and reform targets that played out in certain locations (see Barkatullah 1999; Byrnes 2010; Head 2014; NWC 2011b). Generally, there appears to be little concerted effort to record how the reforms were implemented or championed in different parts of the country—or how these linked to the broader national agenda—in favor of a solely "big picture" coverage of the national scale of the reforms (see Byrnes 2013; Smith et al. 2014; Taylor 2008).

Recently a number of publications have filled some of the gaps outlined previously, and indeed flesh out the historical and procedural context in documenting and understanding Australia's urban water reform process (see Doolan 2016a; Doolan 2016b; Frost et al. 2016; Turner et al. 2016). In particular, the reports compiled by Prof. Jane Doolan (2016a; 2016b) for the Australian Water Partnership offer incisive and quite relevant analyses of the progression of water reforms (both urban and rural) in Australia. The report on the Australian water reform journey (Doolan 2016a) traces the macro-level decisions and initiatives in the water sector over the last three decades. Overall, themes and lessons drawn from this report are deliberately practitioner-focused, and are therefore potentially transferable to other national contexts. The additional report (Doolan 2016b) focuses on attempts in Australia at building resilience to drought, tracing government and water industry reforms in response to the Millennium Drought, such as regional and cross-jurisdiction water allocation rights and environmental and water resource management. This report draws heavily from the *Managing Drought* report (Turner et al. 2016).

In summary, there is not an extensive body of research that details which aspects of the reform process in Australia have generated successful changes and where. A decade-old study by the World Bank (2004); also cited in Langford and Briscoe 2011, and Smith et al. 2014) highlights two characteristics among its lessons from the Australian reform process for others: (a) while reform was guided by a common vision, and directed toward a common goal, reform was achieved while respecting the need for different approaches among the states; and (b) reform was achieved without significant change in the dominant role of the public sector; therefore, substantial privatization has been the exception in Australia's water sector rather than the norm (see Araral and Wang 2013; Troy 2008; World Bank 2014).

While the existing documentation identifies some of the positive steps that have resulted in effective practices from organizational, cost-recovery and sustainability perspectives (see Abbott et al 2012; Brown et al 2009; Byrnes 2013), translation of the Australian reforms to other contexts is complicated by factors such as complex hydrological systems and climate

change risks that can undermine well-intended administrative reforms, emphasizing the need to ensure that reform agendas can allow the emergence of more effective and resilient practices tailored to suit separate and quite distinct jurisdictions (see Muller 2007; O'Leary 2016; Olsson and Head 2015; World Bank 2014, 2016).

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