



ICRC

independent competition and regulatory commission

Regulated water and sewerage
services

**The Industry Panel process:
Outcomes and prospects**

Report 3 of 2015, May 2015

The Independent Competition and Regulatory Commission is a Territory Authority established under the *Independent Competition and Regulatory Commission Act 1997* (the ICRC Act). The Commission is constituted under the ICRC Act by one or more standing commissioners and any associated commissioners appointed for particular purposes. Commissioners are statutory appointments and the current Commissioners are Senior Commissioner Malcolm Gray and Commissioner Mike Buckley. We, the Commissioners who constitute the Commission, take direct responsibility for delivery of the outcomes of the Commission.

We have responsibilities for a broad range of regulatory and utility administrative matters. We have responsibility under the ICRC Act for regulating and advising government about pricing and other matters for monopoly, near-monopoly and ministerially declared regulated industries, and providing advice on competitive neutrality complaints and government-regulated activities. We also have responsibility for arbitrating infrastructure access disputes under the ICRC Act. In discharging our objectives and functions, we provide independent robust analysis and advice.

Our objectives are set out in section 7 of the ICRC Act and section 3 of the *Utilities Act 2000*.

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Foreword

From 19 May 2015 to 30 June 2018, the Commission will be responsible for implementing a price direction that it did not issue, a substitute price direction. This situation has never occurred before. It is made more difficult by the concerns the Commission has about the implications of the substitute price direction for the welfare of the ACT community. These concerns are detailed in this report.

The Commission was denied the opportunity to participate in the process by which the substitute price direction was developed and has not, therefore, had any previous opportunity to express its views.

Our concerns have caused us to consider carefully whether there are any options available to the Commission that could ameliorate the negative consequences for the community that we consider will flow from the implementation of the substitute price direction. We have been unable to identify any means by which we can do so. The *ICRC Act* requires that the Commission implement the substitute price direction as it stands and that the Commission will do.

Malcolm Gray
Senior Commissioner
18 May 2015

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1 Introduction and summary of conclusions

On 5 May 2015, the Treasurer tabled the final report and price direction of the Industry Panel review of the price direction for water and sewerage services prices issued by the Commission in June 2013. Under the *Independent Competition and Regulatory Commission Act* (ICRC Act) and with effect from 19 May 2015, the Panel's price direction now substitutes for the price direction issued by the Commission that has been operating since 1 July 2013.¹ Although the Commission is concerned about the damage that is likely to be done to the interests of all stakeholders by this substitution, it is powerless to prevent it. The process followed by the Panel has not afforded the Commission any opportunity to express these concerns nor to have them considered by the Panel. While the conduct of its review was entirely a matter for the Panel, the Commission wishes to place its concerns on the public record along with the reasons for those concerns. It is not appropriate for the Commission to attempt to provide a comprehensive critique of the Panel's report. This report by the Commission is, therefore, brief and concentrates on the matters the Commission considers are likely to have the greatest impact on the community of the ACT.

1.1 Summary of conclusions

In summary and without the detailed justification and context provided below, the principal conclusions of this report are that:

- The price direction brought down by the Commission provided a regulatory framework that has seen the water and sewerage services business of Icon Water register its largest ever profit in 2013–14 and enabled the smooth and efficient conduct of a biennial review process that was cut short by the Panel's suspension of the relevant parts of the Commission's price direction;
- The broad impact of the substituted determination is to interrupt the process of biennial reviews provided in the Commission's price direction, substitute a three year determination that reverts to previous regulatory practice, and bring forward the next major review by one year, postponing the resolution of the major issues dealt with by the Commission in its 2013 review for five years;
- By largely reverting to previous methods of regulation the substitute price direction has reintroduced all the weaknesses of those methods that became so apparent over the last regulatory period;
- In abandoning the biennial recalibration mechanism, the Panel seems to have given more weight to the short term certainty of a fixed price path than to the

¹ s.24N (1)(a) of the *ICRC Act*.

flexibility to ensure that Icon Water receives its assessed revenue requirement and that large future price shocks are avoided;

- Removal of the opportunities for review by the Commission afforded by a biennial recalibration severely reduces the ability of the Commission to provide assurance to the ACT community that the expenditures actually undertaken by Icon Water are prudent and efficient;
- In spite of the large apparent differences in the rates of return set by the two review processes, they result in an almost identical effective cost of capital used to determine the allowance for a return on capital over the regulatory period;
- The methodology adopted by the Commission guarantees that Icon Water will be able to meet its financing costs while that proposed by the Panel does not;
- The amount of profit the government can expect to receive on average can be determined directly under the Commission's methodology, but not under the Panel's;
- The available evidence supports the contention that the Panel's estimate of the cost of capital for Icon Water is too high and that the Commission's estimate is closer to the mark;
- The longer term outcome of setting the cost of capital too high will be accelerating growth in the allowance for a return on capital and increasing upward pressure on prices;
- The overly optimistic water sales forecasts adopted by the Panel pose a serious threat to Icon Water's flow of revenue within the regulatory period;
- If water sales turn out to be more in line with the Commission's expectations, the Commission estimates that revenues will be reduced to the point that almost no profit is made from water sales over the current regulatory period;
- The change in prices in 2015–16 particularly favours large residential water users, while the largest increase in water bill is experienced by those that use the least water, e.g. small, apartment dwelling households; and
- The Commission considers it very likely that the next regulatory period, starting on 1 July 2018, will begin with a sharp price shock

The provision of water and sewerage services in the ACT confronts significant challenges in the years ahead. The Commission designed the price direction brought down in June 2013 to deal with these challenges and believes that it has and would have continued to prove itself up to that task. The Commission considers that the failure by the Panel to have proper regard for the specific issues arising in the ACT has left the community poorly placed to deal with these challenges.

1.2 Structure of the report

The next chapter describes the Commission's approach to its 2013 review of water and sewerage services prices. The third describes the Panel's approach in undertaking its review. The fourth outlines the substitute price direction and identifies the Commission's principal concerns. The fifth and sixth chapters deal with two particularly important aspects of these concerns: the efficiency and effectiveness of the regulatory process and the determination of the cost of capital. The last chapter draws some overall conclusions and looks ahead to the challenges confronting the community in supplying itself with water and sewerage services in the future. Two appendices deal in more detail with issues in relation to waters sales forecasts and the cost of capital.

2 Basis for the Commission's price direction

Following a review conducted against terms of reference provided by the Treasurer, the Commission brought down its final report and price direction in June 2013.² The review was conducted in difficult circumstances, following a regulatory period that had been dominated by severe water restrictions and commitment to a range of unanticipated water security projects by Icon Water.³ In spite of this, the price direction coming out of the review broke the cycle of increasing water and sewerage services bills, contained a framework to deal with the uncertainties that were seen as overshadowing the future operating environment of the utility and provided clarity and as much certainty as climate variability permits about the level of Icon Water's future profits from its water and sewerage services business.

The Commission's approach was based on a recognition of Icon Water as a publicly owned, monopoly provider of essential services, the beneficial shareholders of which are also its customers. The Commission noted that Icon Water has no shareholders outside the ACT community. Therefore, it made no sense to talk of the interests of Icon Water as separate from those of the community in the way that one might talk of the separate interests of AGL Energy. In this context, "AGL Energy" is being used as a shorthand for the interests of its shareholders, the bulk of whom do not belong to the ACT community. The Commission recognised that much of widely applied regulatory theory, which presumes that there are shareholder interests that are separate from those of the customers of the regulated entity, would need to be recast before it could be applied to Icon Water and the ACT community.

This led the Commission to develop a regulatory approach that, while drawing heavily on previous experience in the ACT and other regulatory jurisdictions, contained some novel features. The innovations were not introduced for the sake of doing something different, but because previous approaches had failed to perform adequately and maintaining those approaches was likely to repeat that failure.

Having undertaken a critical re-evaluation of "all potential regulatory models, including consideration of the provision of sufficient flexibility in price setting across the regulatory period to minimise the impact of significant price fluctuations", as required by the terms of reference, the Commission developed a regulatory model and pricing principles with the following features:

² Available at: <http://www.icrc.act.gov.au/water-and-sewerage/inquiries-and-investigations/>.

³ On 28 October 2014, ACTEW Corporation Ltd. changed its name to Icon Water Limited. To avoid confusion, this report uses the new name of the corporation throughout.

- a regulatory period of six years with prices reset every two years based on a recalibration of the pricing model and adjusted for inflation and any cost pass throughs in alternate years;
- prices set to recover sufficient revenue to meet Icon Water's prudent and efficient costs of providing the services, on average across the likely range of climate variation;
- short-term revenue shortfalls and excesses relative to required revenue to be reflected in Icon Water's profit, but with sustained deviations to be avoided through the biennial reset; and
- required revenue to be determined by a building block approach substantially similar to that previously used by the Commission except that:
 - the regulatory asset base (RAB) would not be indexed for inflation; and
 - the cost of capital would be measured using a firm specific approach to reflect the actual costs of debt and equity relevant to Icon Water.

This approach allowed the Commission to:

- provide the flexibility in pricing that the terms of reference demanded;
- manage the uncertainty surrounding the future level of water sales without Icon Water accumulating significant revenue shortfalls that would generate a major price shock in the future;
- recognise that Icon Water could not, at the beginning of the regulatory period, be expected to reliably forecast capital expenditures beyond two years;
- be more confident about its assessment of the prudence and efficiency of capital spending;
- give Icon Water clearer and more timely indications of the Commission's likely assessment of its capital spending proposals;
- be more certain that the required revenue determined for Icon Water would actually enable it to meet its costs of providing the services, including about the amount of profit to be paid to the shareholder as dividends and tax equivalent payments;
- avoid price adjustments triggered by cyclical climate variability, while maintaining the flexibility to adjust prices in the face of shocks judged likely to have a sustained impact;
- reduce regulatory uncertainty by, as far as possible, aligning current prices with current costs; and
- avoid postponing necessary adjustments to a future regulatory period and the very extended delivery of required revenue inherent in an indexed RAB.

In addition, the Commission determined that the \$238 million revenue shortfall, claimed by Icon Water to have accrued over the previous regulatory period, would not be recovered in the current regulatory period. This determination hinged crucially on the Commission's recognition that the beneficial owners of Icon Water and its customers were identical. Had Icon Water been viewed as having interests separate from those of the ACT community, as is the case when a typical firm benchmark is applied, there would have been a much stronger case for recovering the shortfall.

The review process proved complex and contentious with the Commission placed under considerable pressure by the aggressive attitude adopted by Icon Water and a decision by the Auditor General to commence a performance audit of the review before the process had been completed and at precisely the time the Commission was engaged in its most demanding deliberations. In spite of this, the price direction brought down by the Commission provided a regulatory framework that has seen the water and sewerage services business of Icon Water register its largest ever profit in 2013–14 and enabled the smooth and efficient conduct of a biennial review process that was cut short by the Panel's suspension of the relevant parts of the Commission's price direction.

3 Basis of the substitute price direction

Given the contention of the review process, it did not come as a great surprise when Icon Water lodged an application for the review of the Commission's price direction by an Industry Panel in September 2013. The application cited lack of cost reflectiveness and flaws in the regulatory model adopted as grounds for the review. An Industry Panel was appointed in April 2014, following delayed publication of the performance audit mentioned in the previous chapter. The Panel published a draft report in December 2014.⁴ By then, with the experience of 18 months of operation of the Commission's price direction, it was apparent that many of the concerns expressed by Icon Water in its application were without foundation. Nevertheless, the Panel elected to continue the process with the aim of producing a "preferable decision". The Treasurer released the Panel's final report and price direction on 5 May 2015.⁵ The Commission considers that, taken together, the Panel's reports and price directions fail to address the terms of reference for the original review and provides a price direction that will damage the interests of all stakeholders.

3.1 Approach and process

The Panel began its task not, as many were expecting, by reviewing the merits and evidentiary base for the claims in Icon Water's application for a review, but instead by noting that, if those claims were true, it could have a serious impact on Icon Water's financial viability. The Panel determined that a substantive review was, therefore, required and that the purpose of this review should be to create a new, replacement price direction, "preferable" to the Commission's. In formulating an approach to the review now deemed to be necessary, the Panel made two critical decisions: to limit the matters they would consider because "[the Panel] has limited ability to investigate innovative approaches and/or examine matters likely to require extensive consultation" and to rely on "best practice" methods of regulation.

The former decision effectively prevented the Panel fully addressing the terms of reference for the original review in remaking the Commission's determination. In particular, the requirement to consider "all potential regulatory models" could not be met nor could the desire underlying that term of reference to seek ways of improving the existing regulatory framework be addressed. This limitation on the matters being

⁴ Industry Panel (2014).

⁵ Industry Panel (2015).

considered prevented the Panel from considering many of the factors and possible approaches that had been central to the Commission's deliberations.⁶

In the latter decision, the Panel is chasing a chimera. Views about what constitutes best regulatory practice differ across individual practitioners, across jurisdictions and over time. The theory on which regulation is based is subject to constant development and change. Experience, which informs the judgements that regulation necessarily involves, is constantly accruing. Circumstances change and regulation adapts to those circumstances to meet the purpose of regulation, the balancing of all interests. In Australia there has been widely voiced dissatisfaction with the way the Australian Energy Regulator is regulating the entities providing network services. The United Kingdom is in the throes of making major changes to the way it regulates key utilities. One thing is, however, clear: the best regulatory response depends critically on the precise nature of the particular situation being confronted and the context, including previous experience, in which the regulatory decision is being made. In practice the Panel identified "best practice regulation" as that practiced by an arbitrary and variable selection of Australian regulators, without regard to whether the situations confronted by those regulators had any relevance to the situation in the ACT. Thus the chimera of best practice regulation was translated to the reality of common practice regulation.

In terms of its processes, the Panel made a decision to exclude the Commission almost completely from its deliberations. It is not apparent that the Panel gave proper consideration to the Commission's reports or the views of stakeholders, including the ACT government, received in the course of the preparation of those reports. The Commission was not asked to explain the reasoning underlying its determinations nor given an opportunity to respond to the claims made by Icon Water in its application and subsequent statement of facts and contentions. The Panel made no use whatever of the accumulated experience and technical expertise of the Commission in spite of express provisions in the ICRC Act that provided mechanisms for it to do so. Exclusion of the Commission made the Panel excessively dependent on Icon Water for information about the situation in the ACT. This limited the Panel's perspective on the matters before it and, as we had occasion to advise the Panel, caused it to base decisions on information that was erroneous.⁷ The Panel expressly noted that it did not wish to receive a submission from the Commission on its draft report, preventing the

⁶ There is no evidence that the Panel had less resources at its disposal than the Commission, particularly when it is remembered that the Commission was conducted two other major reviews for much of the period occupied by the water and sewerage services review and that the Panel has three part time members and the Commission is composed of two part time Commissioners.

⁷ Letter from the Commission of 28 January 2015 to the Industry Panel outlining the Commission's concerns about the misrepresentation of the ACT's policy on competitive neutrality in the Panel's draft report. The Panel failed to correct its error in its final report, instead choosing to obfuscate the issues raised in the Commission's letter.

Commission from pointing out to the Panel the respects in which its draft report misrepresented the Commission's position.⁸

3.2 Regulatory outcomes

As a consequence, in its final report, the Panel has largely recreated the methods of regulation that were in operation in the regulatory period 2008–13 and caused the Treasurer to ask the Commission to consider "all potential regulatory models, including consideration of the provision of sufficient flexibility in price setting across the regulatory period to minimise the impact of significant price fluctuations". In its final report and price direction the Panel reverts to:

- a five year regulatory period;
- a fixed price path relative to movements in the consumer price index (CPI) over the next 3 years, with a pass through mechanism but without any review mechanism to provide flexibility to adjust to shocks;
- a catch up mechanism to operate in the subsequent regulatory period for revenue shortfalls or over collections outside a deadband occurring in the current regulatory period;
- an indexed regulatory asset base (RAB); and
- measuring the cost of capital using the so called typical or benchmark firm approach.

3.2.1 Water sales forecasts

In addition, the Panel, on the advice of its consultant, adopts a radically different approach to forecasting water sales than any previously used by the Commission or Icon Water, producing forecasts well above any recently suggested by either of those entities. The final report forecasts water sales of 43.15 GL for 2014–15 with sales in subsequent years rising at the rate of about half a gigalitre per year. Based on data for the first eight months of 2014–15, which include the months of heaviest water consumption, Icon Water estimate that water sales in 2014–15 will be about 39.5 GL. The most recent work of the Commission, using monthly billed consumption data through to March 2015 and daily dam releases data through to 31 March 2015, produced a similar figure. For the reasons presented in Appendix 1, which also describes the misrepresentation of the Commission's position, the Commission's view is that the projected bounce back is not credible. The implication of the Panel's forecasts overestimating water sales is discussed in Chapter 7.

⁸ Letter from the Industry Panel of 15 January 2015 to the Commission responding in the negative to the Commission's request for a copy of the Panel's pricing model.

4 Outline of the substitute price direction

The Commission's price direction has been operating for almost two years. This has meant that the Panel's deliberations have served some of the updating purposes intended to be served by the Commission's biennial review. There are, however, some important differences in context and objectives, discussed below. This delay in the review process also means that the Panel's decision only affects prices and Icon Water revenues for the next three years, through 2017–18. In the final report, however, the Panel has established a revenue allowance and price path for the whole five year regulatory period and set prices for the next three years based on the last three years of this price path. In doing this, the Panel has used some information not available to the Commission in 2013, for example on Icon Water's actual and proposed expenditures and water sales for 2013–14, and ignored some other information, for example water sales during 2014–15 and the consumer price index (CPI) for March 2015.

In effect, therefore, the broad impact of the Panel's determination is to interrupt the process of biennial reviews provided in the Commission's price direction, substitute a three year determination that reverts to previous regulatory practice, and bring forward the next major review by one year. This simply postpones dealing with the major issues confronted by the Commission in its 2013 review for five years.

The impact of the final report is, therefore, to:

- remove the capacity for flexibility in pricing that the original terms of reference demanded, which will increase uncertainty about whether the Icon Water will actually receive the revenues that the Panel has determined are required;
- manage any differences between the forecast and actual level of future water sales by allowing Icon Water accumulate revenue shortfalls or credits that may generate price shocks in the future;
- tie prices three years hence to the forecasts of its capital expenditures that Icon Water makes now with no scope to adjust for differences between Icon Water's planned and actual expenditures or to changes in Icon Water's proposed expenditures;
- remove the mechanism designed to increase confidence in assessments of the prudence and efficiency of capital spending;
- fail to provide any substantive opportunity for interaction between Icon Water and the regulator before the next major review;
- reintroduce confusion and uncertainty about whether the required revenue determined for Icon Water would actually enable it to meet its costs of providing the services and about the amount of profit to be received by the shareholder as dividends and tax equivalent payments;

- postpone any adjustment to prices in the face of shocks judged likely to have a sustained impact until the next regulatory period, requiring Icon Water to absorb a portion of any resulting revenue deficits or surpluses and carrying forward the remainder;
- increase regulatory uncertainty by deferring the collection of revenues assessed as necessary for Icon Water to meet its prudent and efficient costs of providing the service through the reintroduction of the very extended delivery of required revenue inherent in an indexed RAB, risking damage to Icon Water's financial stability; and
- increase the costs of regulation by:
 - increasing the frequency of major reviews;
 - making those reviews more complex and contentious;
 - determining the cost of capital through expensive financial modelling, a process very likely to attract challenge from the utility; and
 - recommending that the Commission require Icon Water to provide information to the regulator annually that the regulator has no way of acting on.

Aside from the cost of the proposals, of particular concern here are the loss of:

- mechanisms designed to improve communication between the regulator and regulated entity and thus increase the efficiency and effectiveness of the regulatory process; and
- clarity about the implications of the determination of the rate of return on capital for the financial stability and profitability of Icon Water.

The Commission is also concerned that the overly optimistic water sales forecasts pose a serious threat to Icon Water's flow of revenue within the regulatory period and that failure by the Panel to have proper regard for the specific issues arising in the ACT has left the community poorly placed to deal with the challenges the future is likely to bring.

5 Efficiency and effectiveness of the regulatory process

It became apparent to the Commission early in the 2013 review process that the traditional approach, involving four or five yearly reviews with little or no contact between the regulator and regulated entity in between, had major weaknesses, including:

- lack of any flexibility to deal with events not anticipated in the price direction;
- requiring the Commission to set a price path for five years against, what was in 2013, a very uncertain outlook for water sales following the ending of the Millennium drought;
- providing no means for the Commission to deal with the considerable uncertainty about Icon Water's capacity to manage its operating and capital expenditure budgets effectively;
- Icon Water being left largely in a regulatory vacuum between reviews in managing its capital spending budget in a changing business environment; and
- lack of any mechanism to facilitate regular substantive dialogue between the regulator and regulated entity, thereby doing nothing to prevent the development of divergent views and increasing the likelihood that the infrequent review processes would be contentious.

5.1 Biennial recalibrations

As noted earlier, the Commission developed the biennial recalibration process to address these weaknesses. The decision to adopt a six year regulatory period flowed from its decision to adopt a biennial recalibration of prices. That meant that the regulatory period needed to be an even number of years. The Commission opted for six rather than four to reduce the frequency of major reviews, which are costly.

The decision to introduce a biennial recalibration of prices was inspired by the very successful use of a similar mechanism of annual recalibrations of regulated retail electricity prices. Because a recalibration of water and sewerage services prices was likely to be somewhat more involved than a recalibration of retail electricity prices, the Commission opted for a biennial rather than annual recalibration.

In abandoning the biennial recalibration mechanism, the Panel seems to have given more weight to the short term certainty of a fixed price path than to the flexibility to ensure that Icon Water receives its assessed revenue requirement and that large future price shocks are avoided. The Commission considers this is precisely the opposite of the preferences of the ACT as expressed through the terms of reference for the 2013 review, the submissions by Icon Water to the 2013 review, submissions from the

public and other public comment on the experiences with the fixed price path set following the 2008 review.

The Commission considers that there are now grounds for being more confident about the outlook for future water sales than was the case in 2013 and that, therefore, the risks arising from that source should be less. The water sales forecasts used by the Panel are, however, radically at variance with recent work by the Commission and Icon Water. The Commission considers that this will reintroduce water sales risk, along with the need for the flexibility to deal with it, which the Panel's substitute price direction has removed.

5.2 Icon Water's planning processes

The Commission's examination of Icon Water's past performance in 2013 revealed considerable variances between planned and actual expenditures, not all of which were readily traceable to changed circumstances. Cardno, the Commission's consultant on Icon Water's project planning and capital budgeting processes, identified significant shortcomings in those processes.⁹ Icon Water itself was undertaking significant restructuring, having recently brought these management functions in house following the ending of the Utilities Management Agreement (UMA) and introduced, during the course of the 2013 review, a new project evaluation process.

In its draft report and based on data provided to it late in 2014, the Panel assessed that the risks of Icon Water's actual capital and operating expenditures differing from planned is substantially less in the forthcoming period than it was previously because the large expenditures associated with the water security projects are now complete. The issues that the biennial recalibration mechanism was introduced to deal with did not relate particularly to the water security projects, which were among the better managed, but to a wider incapacity of Icon Water to match actual to planned expenditure on projects and to uncertainty about the effectiveness of initiatives to improve the quality of the project evaluation and capital budgeting process.

The more recent data provided to the Panel by Icon Water does not support the hypothesis that there is less risk of actual expenditure departing from planned in the future. This data shows that some projects planned for execution in the last 18 months appear to have been abandoned and others that had not previously been notified to the Commission have been undertaken instead. In its draft report, the Panel seem reassured by the fact that total actual expenditure is similar to total planned expenditure. This misunderstands the purpose of the regulator's review of capital expenditure which is to ascertain whether the projects undertaken constituted a prudent and efficient response to the task of providing water and sewerage services to the ACT. We also note that the position taken by the Panel in its draft report contradicted the advice of its own consultant on these matters, Cardno.

⁹ Cardno (2012).

Following release of the Panel's draft report, data provided to the Commission by Icon Water as part of the biennial recalibration then under way became available to the Panel.¹⁰ After examining this data, the Panel decided to reverse its decision on the Cardno advice and reduced the Panel's forecast of Icon Water's capital expenditure by \$20 million. Given the use made by the Panel of biennial recalibration data, it is difficult to see how it can be argued that this process is unnecessary or that biennial recalibration by the regulator will not improve regulatory outcomes.

When the operating and capital expenditure estimates provided by Icon Water are displaying the volatility noted by the Commission during its 2013 review and recognised by the Panel in its decision on forecast capital expenditure, the decision of the Panel to remove the opportunities for review by the regulator afforded by a biennial recalibration severely reduces the ability of the regulator to provide assurance to the ACT community that the expenditures actually undertaken by Icon Water are prudent and efficient.

Finally, removing the biennial recalibration also removes the rolling six year time horizon and increases the risk that Icon Water will undertake unforeseen capital expenditures in response to changed circumstances that the Commission will subsequently judge not to have been prudent and efficient. With the development cycle for large projects extending over four or five years, the biennial recalibrations gave Icon Water and the Commission multiple opportunities to discuss the project as it moved from a possible need, to a possible solution, to a developed business case and to a committed project. By reducing the quantity and quality of the information that the Commission is able to collect about changes in Icon Water's business environment and its responses to them, the Commission's task of determining whether capital expenditure has been prudent and efficient is made more difficult and the chances that the Commission will make a mistake increased. Both these factors work to increase the regulatory risk that Icon Water will face under the substitute price direction.

5.3 Weaknesses reintroduced

In summary, by largely reverting to the regulatory methods of the Commission's 2008 review, the substitute price direction reintroduces all the weaknesses of that approach detailed above.

¹⁰ The Panel's draft report was released on 3 December 2014. As required by the Commission's price direction, the material provided by Icon Water as part of the biennial recalibration was placed on the Commission's website on 8 December 2014.

6 Determination of the rate of return on capital

Both the original price direction of the Commission and the substitute price direction of the Panel calculate the return on capital element of required revenue by applying a weighted average cost of capital (WACC) to the regulated asset base or RAB.¹¹ Each calculates the WACC as the weighted average of the cost of debt and the return on equity, with the weights being determined by the gearing ratio of Icon Water (the ratio of Icon Water's debt to the sum of its debt and equity, currently around 60 per cent).

The price directions differ in the way they estimate the cost of debt and the return on equity. The Commission's price direction bases its estimates on the actual financing costs that must be met by Icon Water and an assessment of a reasonable return to the community from its ownership of Icon Water. The substitute price direction bases its estimates on consideration of a hypothetical firm, sometimes described as a typical or benchmark firm. Financial models are used to ascertain the cost of debt and the return on equity that would apply to this hypothetical firm and these are used to calculate a WACC. Whereas the Commission's price direction simply applies the WACC to the RAB, the draft price direction discounts the WACC for inflation before applying it to the RAB. In order to offset this discounting of the WACC, the substitute price direction indexes the RAB, that is, it increases its value at the end of every year by the amount of inflation that has occurred through the year.

The arguments surrounding the relative merits of these two approaches are complex and a somewhat more detailed discussion than that given here is provided in Appendix 2, which also explains how the position of the Commission is misrepresented in the Panel's draft report. It is useful to begin by focussing on the impact of the choice on the revenues received by Icon Water during the regulatory period.

6.1 Return on capital within the regulatory period

As a first step in making a comparison, let us assume that the other assumptions made under the competing approaches, in regard to water sales and the other costs that Icon Water must meet, prove accurate in the respective cases. It would then appear that the Panel's final report is far more generous in providing a return on equity of 8.28 per cent and a cost of debt of 6.48 per cent than the Commission's final determination of 2.8 per cent and 5.5 per cent, respectively. These figures are, however, not directly comparable. Whereas the Commission's rates are applied to the RAB to yield the cost of capital component of required revenue, the Panel's rates must be discounted for

¹¹ The RAB is that portion of the assets used by Icon Water in the provision of water and sewerage services that the Commission has determined as having resulted from prudent and efficient capital expenditures. In recent years, the RAB and the assets of the water and sewerage business as reported in Icon Water's statutory accounts have been very close in value.

inflation before being applied to the RAB. In addition, the Commission indicated that, subject to business conditions not deteriorating sharply, it would increase the return on equity to 4.4 per cent and 6.0 per cent at the biennial recalibrations in 2015–16 and 2017–18, respectively. The calculations required to produce comparable figures are shown in Table 6.1.

Table 6.1 Cost of capital calculations, 2014–15 to 2017–18

| Year ending | 2014 | 2015 | 2016 | 2017 | 2018 | Average |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
| Commission | | | | | | |
| Cost of equity | 2.80% | 2.80% | 4.40% | 4.40% | 6.00% | 4.08% |
| Cost of debt | 5.50% | 5.50% | 5.50% | 5.50% | 5.50% | 5.50% |
| Cost of capital | 4.42% | 4.42% | 5.06% | 5.06% | 5.70% | 4.93% |
| Panel headline values | | | | | | |
| Cost of equity | 8.28% | 8.28% | 8.28% | 8.28% | 8.28% | 8.28% |
| Cost of debt | 6.48% | 6.48% | 6.48% | 6.48% | 6.48% | 6.48% |
| Cost of capital | 7.20% | 7.20% | 7.20% | 7.20% | 7.20% | 7.20% |
| Panel adjusted for expected inflation at 2.5 per cent | | | | | | |
| Cost of equity | 5.64% | 5.64% | 5.64% | 5.64% | 5.64% | 5.64% |
| Cost of debt | 3.88% | 3.88% | 3.88% | 3.88% | 3.88% | 3.88% |
| Cost of capital | 4.59% | 4.59% | 4.59% | 4.59% | 4.59% | 4.59% |
| Panel adjusted for expected inflation and indexed RAB | | | | | | |
| Cost of equity | 5.64% | 5.78% | 5.92% | 6.07% | 6.22% | 5.93% |
| Cost of debt | 3.88% | 3.98% | 4.08% | 4.18% | 4.29% | 4.08% |
| Cost of capital | 4.59% | 4.70% | 4.82% | 4.94% | 5.06% | 4.82% |
| Panel effective cost of equity | | | | | | |
| Memo item | 3.21% | 3.50% | 3.79% | 4.09% | 4.40% | 3.80% |

Source: Commission's calculations.

Table 6.1 consists of four blocks of three rows, one block relating to the Commission and three to the Panel, and a single line memo item at the end. The first block records the costs of equity and debt and resultant cost of capital adopted in the Commission's final report. The Commission applies the cost of capital recorded here to the RAB to determine the allowance in required revenue to provide a return on capital. The second block records the costs of equity and debt and resultant cost of capital adopted in the Panel's final report. Before applying these to the RAB, the Panel adjusts them for expected inflation, here taken to be 2.5 per cent.¹² The effect of this adjustment is shown in the third block. It also needs to be recognised that the Panel applies the cost of capital to a RAB that is indexed for expected inflation. Comparable rates to those applied to the unindexed RAB by the Commission can be obtained by indexing the

¹² This is the expected rate of inflation used by both the Commission and the Panel.

rates in the third block to allow for expected inflation. The result of this adjustment is shown in the last block.

A comparison may now be made between the effective cost of capital used by the Commission and that used by the Panel, where effective means the rate applied to the unindexed RAB to determine the allowance for a return on capital. These are the lines highlighted in Table 6.1. Averaged over the regulatory period, the effective costs of capital used by the Commission and the Panel differ by only 11 basis points.¹³ Thus, in spite of the large apparent differences in the rates of return set by the two review processes, they result in an almost identical effective cost of capital used to determine the allowance for a return on capital over the regulatory period.¹⁴

If the focus is on the financial viability of Icon Water and the return to government, the effective cost of equity is the relevant rate, where effective means the rate at which a return can actually be paid to the shareholder. The Commission's cost of debt reflects the actual finance costs payable by Icon Water so will certainly cover those costs, which means that the effective cost of equity is the one determined by the Commission and shown in the first block of Table 6.1. In contrast, the Panel's cost of debt is derived from a financial model that has no connection with Icon Water's actual cost of debt. In this case, the average provision of 4.08 per cent shown in the fourth block of Table 6.1 will not provide a sufficient allowance within required revenue to meet Icon Water's actual debt costs. Since these costs must be met, Icon Water will need to utilise some of the allowance provided to pay a return to shareholders to meet them.

The last line of Table 6.1 shows the rates of return to shareholders that Icon Water will actually be able to pay. Over the regulatory period, the effective costs of capital, representing the actual return to shareholders, differ by only 28 basis points.¹⁵ The Commission's price direction provides an average of 4.08 per cent and the substitute price direction provides 3.80 per cent.¹⁶

The methodology adopted by the Commission guarantees that Icon Water will be able to meet its financing costs. That proposed by the Panel does not. To determine whether any particular combination of rates under the Panel's proposed methodology provides a sufficient allowance to meet Icon Water's financing costs involves making the calculation described above.¹⁷ The amount of profit the government can expect to

¹³ A basis point is one hundredth of a percentage point.

¹⁴ Indexation of the RAB also increases the allowance for depreciation in required revenue. Within the regulatory period this effect is relatively small. Its longer term impact is discussed in Appendix 2.

¹⁵ Since the costs of debt have both been set to the actual costs of debt in calculating the effective cost of equity, the difference in the effective costs of capital is 40 per cent of the difference in the effective costs of equity, reflecting the weight of the latter in the former.

¹⁶ If the assumption that the Commission would have increased the cost of equity to 6 per cent in 2017–18 is dropped, the difference in the average effective costs of equity falls to 4 basis points, in the Panel's favour.

¹⁷ An alternative, adopted by the Panel, is to conduct a so-called financeability test. This again involves more calculations; calculations that are unnecessary under the approach adopted by the Commission.

receive on average can be determined directly under the Commission's methodology by multiplying the Commission's cost of equity by the amount of equity the government holds in the water and sewerage services business. Under the methodology proposed by the Panel, the calculation is much more involved and needs to include a check that the provision for debt costs is sufficient to allow Icon Water to meet its obligations.

6.2 Beyond the current regulatory period

Beyond the current regulatory period, the implications of adopting an indexed RAB are more complex and are discussed in Appendix 2. As we move beyond the current regulatory period the similarity between the outcomes obtain under nominal and indexed RABs disappears. The principal conclusions to emerge from the discussion in Appendix 2 are that:

- providing financial stability for the regulated entity for the sort of period over which financial evaluations are usually conducted requires a higher cost of capital under an indexed RAB than under a nominal RAB;
- the typical firm approach is one way of providing such a higher the cost of capital;
- the available evidence supports the contention that the Panel's estimate of the cost of capital for Icon Water is too high and that the Commission's estimate is closer to the mark; and
- the longer term outcome of setting the cost of capital too high will be accelerating growth in the allowance for a return on capital and increasing upward pressure on prices.

7 The way ahead

The Commission's concerns for the future of the provision of water and sewerage services in the ACT relate to all stakeholders: Icon Water and the government, customers and the community as a whole.

7.1 For Icon Water and government

Whether or not Icon Water actually collects the revenues corresponding to the various allowances discussed in previous chapters depends on the volume of water sales actually achieved. If actual water sales fall short of the respective forecasts, profits will be reduced by the amount of the revenue shortfall. If actual sales exceed forecasts, then profits will be increased to the extent of the extra revenue collected. Since the Commission believes that the water sales forecasts in the Panel's draft report are too high to be credible, the Commission believes that the Panel's price direction will set water prices too low and the profit implied by the Panel's return on equity, after making the adjustments outlined above, will not be achieved.

The following rough, indicative calculation illustrates the possible magnitude of this effect. The government's equity in the water business of Icon Water stood at about \$480 million at the end of 2013–14. Under the determinations made in the Panel's final report, the effective rate of return on equity will average about 3.8 per cent over the regulatory period. If the Panel's water sales forecasts, which average 43.5 gegalitres (GL) per year over this period, are realised, this would yield an average profit of about \$18.2 million per year. If, alternatively, water sales are more in line with the Commission's expectations and average only 39.7 GL per year, the Commission estimates that revenues will be reduced by about \$18.3 million per year, on average, resulting in no profit being made by the water business over the current regulatory period.¹⁸ As a point of reference, the Commission estimates that Icon Water's water business made a profit of \$30 million in 2013–14, the first year of operation of the Commission's 2013 price direction.

7.2 For customers

The projected effects on customers within the regulatory period are covered extensively in the Panel's final report. Two aspects are worth noting.

The change in prices in 2015–16 particularly favours large residential water users. For example, the water bills of those using more than about 450 kilolitres (kL) per annum fall. The largest increase in water bill is experienced by those that use the least water.

¹⁸ These calculations assume that the Panel's estimates of Icon Water's required revenue prove to be accurate.

Small, apartment dwelling households, consuming 50 kL per annum, can expect almost twice the proportionate increase in their bill relative to the typical household, consuming 200 kL per annum. The comment on page 116 of the Panel's final report that "households with low levels of water consumption (of less than 100kL per annum) will have bills in 2017-18 that are lower than they were in 2012–13" is disingenuous. The only year in which the water bill of this group of customers falls is 2013-14 so the result noted in the Panel's final report is entirely due to the reduction in prices of sewerage services introduced by the Commission in the first year of its price direction. Of more concern to the Commission, however, is the prospective spike in water prices at the beginning of the next regulatory period on 1 July 2018.

If the Commission's forecasts of water sales prove accurate, the regulator will be confronted by a requirement to sharply increase water prices in order to restore Icon Water's water business to profitability at the beginning of the next regulatory period. In addition, the regulator will need to make arrangements, including through further increases in prices, to recover that portion of revenue lost by Icon Water in the current period that lies outside the deadband established under the substitute price direction.¹⁹ The Commission considers it very likely, therefore, that the next regulatory period will begin with a sharp price shock.

7.3 For the community

The provision of water and sewerage services in the ACT confronts significant challenges in the years ahead. The Commission considers the Panel's final report does not respond fully to the terms of reference for the original review or provide a framework to deal with the challenges confronting the provision of water and sewerage services in the ACT. In the Commission's opinion, these failings will have serious consequences for the management of the provision of these services, both in the years immediately ahead and in the longer term.

The challenges derive principally from developments in the demand for water and sewerage services. The population of the ACT is growing and is projected to continue to grow. At the same time average household size is falling. These trends are reflected in growth in Icon Water account customers, which is outstripping population growth.

On the sewerage services side, this has meant growth in demand for the service, driven by population growth, and growth in revenues, which for domestic customers at least are collected as a fixed charge per account. Since account growth exceeds population growth, revenues from sewerage services are, in broad terms, growing faster than the demand for those services. Absent any disproportionate increase in costs, of which

¹⁹ Of the revenue lost during the current regulatory period in the indicative calculation in the previous section, about 24 per cent would be recoverable in the following regulatory period under the deadband mechanism.

more below, this means there is little or no upward pressure on the price of sewerage services.

The picture for water is, unfortunately, rather less rosy. Water revenues come from a small fixed charge and a two-tier volumetric charge that collects the bulk of the revenues. While the number of customer accounts for water is growing strongly, the demand for water is not growing at all. In fact, water sales have fallen sharply over the last 15 years, from an average level of 50 GL per annum in the first seven years of the period to an average level of 39 GL in the most recent 8 years. Moreover, the average proportion of water being sold at the higher of the two price tiers, which is twice the price of the lower tier, is also falling. Absent any increase in prices, the revenues of the water business will fall. Since costs are insensitive to the volume of water sales, water prices must rise to maintain the financial viability of the water business.

The price of water has already risen sharply in recent years as lower water sales have combined with increased debt servicing costs, driven primarily by the large, debt-financed investments in water security projects. The increased demand for sewerage services is now creating a need for significant investments in the facilities providing those services. If the required increase in prices of water and sewerage services are to be kept within even modestly reasonable bounds, potential investment projects must be subject to rigorous examination and a tight rein must be kept on operating costs. Icon Water's track record in these areas do not encourage a belief that this is likely to happen spontaneously.

Managing the competing pressures of restraining price increases while ensuring the financial viability of Icon Water and providing a return to government requires that the tradeoffs between these competing objectives be clearly and accurately understood. The Commission designed the price direction brought down in June 2013 to deal with these challenges and believes that it has and would have continued to prove itself up to the task. The Commission does not consider that the substitute price direction displays an awareness of these challenges or provides a framework capable of meeting them.

Appendix 1 Water sales forecasting

A1.1 The objective of water sales forecasting

The purpose of the water sales forecasting undertaken during a review of water and sewerage services is to determine what price of water would allow Icon Water to achieve the level of revenue that the review has determined is required to allow it to meet its prudent and efficient costs, including providing a return to its shareholders. The level of water sales in a future year cannot be known with certainty, being subject to influence by a range of factors, most importantly, variations in climate. Since predicting the weather is notoriously difficult, the Commission contents itself with identifying the price that will on average, across those varying circumstances, allow Icon Water to receive required revenue.

The objective of water sales forecasting in the context of a review is then, not to forecast what sales will actually be in a particular year, but to estimate what water sales would be on average over the period for which prices are being set. Where it has been established that a statistical model captures the relationship between water sales and the factors determining it, the usual method of ascertaining the average level of water sales is to run the model across a range of scenarios that represent the likely range of variation of the determining factors and average the forecasts so obtained.

A1.2 Statistical models

Most of the effort in water sales forecasting has, therefore, focussed on building a statistical model or modelling procedure relating water sales to the factors determining it. Since the principal source of variation in Canberra's water use is in use outdoors, attention has naturally focussed on climate as the principal determining factor. The Commission and Icon Water have made a number of attempts to build such a model.²⁰

In order to employ statistical methods the process or behaviours relating the determining factors to water sales must be stable. At the time of the 2013 review, the Commission became concerned that a change in behaviour may have occurred at about the time the severe water restrictions were imposed in the ACT. Water restrictions are, of course, designed to reduce water consumption below the levels that would otherwise have obtained. Following the lifting of restrictions in late 2010, however, water consumption showed no signs of returning to its previous levels. There were no signs of what came to be called "bounce back". In the 2013 review, the Commission was, therefore, disinclined to rely entirely on any of the then available models. Instead, the

²⁰ These were recently surveyed in the Commission's technical paper on water demand forecasting published in January 2015 [ICRC (2015a)].

Commission determined a forecast of water sales based on indications from a variety of models, bearing in mind the uncertainties inherent in the then current situation and the importance of maintain the financial stability of Icon Water. The Commission described the forecast it settled upon, 38 GL per year, as conservative as it was below the other forecasts current at that time including those then proposed by Icon Water.

The availability of more data, generated under a more varied range of climate conditions, and more work by the Commission has allowed it to develop its current position. The Commission now considers that the hypothesis that is best supported by the available evidence is that a sharp shift in the relationship between water sales and the variables determining it occurred between 2005–06 and 2006–07, but that since 2006-07 the relationship has been stable. Water sales data is available for the financial years from 1999–00 to 2013–14. For the first seven years of this period, up to 2005–06, water sales ranged between 43.5 GL and 55.9 GL per year, averaging 49.6 GL per year. For the last eight years, from 2006–07, water sales have ranged between 33.8GL and 45.6 GL per year, averaging 38.8 GL per year. The Commission's most recent statistical work has concentrated on the period since 2006–07 and a stable relationship between water sales and the factors determining it has been found. This relationship shows water sales fluctuating around a constant average, depending on climate conditions. There is no evidence that water sales are trending up or down.

A1.3 The Panel's approach

The Panel asked its consultant, Cardno, to review the adequacy of Icon Water's water forecasting model and, if found inadequate, propose an alternative.²¹ Cardno criticised the forecasts of Icon Water on grounds most of which are spurious and were identified as such in Icon Water's response to the Panel's draft report. One ground is, however, worthy of more serious attention: that Icon Water's forecasts made no allowance for population growth in the ACT.

At first sight this may seem reasonable: more people surely implies higher water consumption. We do not, however, observe the ACT's water consumption trending upwards. As was noted above, over the last 15 years the ACT's water consumption has been trending downwards. This apparent inconsistency between population growth and water consumption has usually been explained by drawing attention to:

- a history of government programs to encourage and, in some cases, mandate water conservation;
- three years of experience of severe water restrictions, driving substantial investment in more water efficient technologies;
- increases in population density decreasing outdoor water use; and
- substantial increases in the price of water.

²¹ Cardno (2014).

The evidence from the Commission's most recent work is that, for the last eight and a half years, the factors listed above seem to have more or less exactly offset any increase in consumption that would otherwise have resulted from the population growth that the ACT has experienced over that period. The ANU consultants employed by Icon Water made a similar observation in regard to a longer period in an earlier piece of work.²²

Having rejected the approach taken in previous work, Cardno opts instead to try to forecast water sales per customer and customer numbers for the four subgroups into which Cardno divides customers. Adopting this approach has a number of immediate consequences, including:

- restricting the data available to Cardno, with the equations at the heart of its model estimated on the basis of 13 annual observations;
- forcing Cardno to adopt a data period extending right through the 2000s, in spite of the sharp behavioural changes that seem to have occurred around the middle of that period; and
- leaving Cardno having to find an explanation for the decline in water sales per customer that occurred over that period.

In summary, Cardno sets itself the task of disentangling the drivers of a trend decline in water sales per customer, the causes of the sharp reduction in water sales that occurred during the 2000s, and the influences of climate on water consumption, using an equation estimated on 13 annual observations. For comparison, the Commission's recent model:

- focuses on total water sales for the period since 1 July 2006,
 - which show no evidence of a trend in either direction and are capable of being explained entirely by variations in climate; and
- uses daily data on dam releases as a proxy for water consumption,
 - which provides a sample containing in excess of 3,100 daily observations with which to estimate the influence of climate on water sales,
 - allowing current techniques of time series analysis to be applied to the problem.²³

Cardno's initial approach to the task it sets itself is to divide customers into four classes and develop an equation for each class that seeks to capture the effects of climate in a single explanatory variable and the impact of water restrictions in another. These equations fit poorly, essentially leaving the trend decline in sales per customer

²² Breusch and Ward (2012).

²³ This work is described in the Commission's January 2015 and April 2015 technical papers on water demand forecasting [ICRC (2015a) and ICRC (2015b)].

unexplained. Cardno seeks to remedy this deficiency by introducing adjustments to the sales per customer to reflect factors like lower water consumption in newer buildings and smaller households. This substantially improves the fit of the units equation, but leaves the equation for freestanding houses, the most important category, still fitting poorly. Cardno then turns its attention to what it calls the "structural break hypothesis".

7.3.1 The structural break hypothesis

Cardno first notes that "any additional explanatory variable which we add to the regression model will improve the residual error as long as the variable either consistently increases ... or consistently decreases ...". Cardno then notes that population would be such a variable, but, since it increases while the variable to be explained decreases, population would have a negative coefficient. Cardno dismisses this as "clearly a spurious result" because "we know that an increasing population does not necessarily result in a decreasing per property consumption".

Cardno then produces a consistently increasing variable, which is christened "water aware", calculated as the cumulative sum of an annual index of the severity of water restrictions in each year.²⁴ For example, if the stage three restrictions, which are represented by the value 4 in the annual index, were in place throughout the first three years of the data period, the values of water aware for the first three years would be 4, 8, and 12. Cardno characterise this as reflecting the Commission's structural break hypothesis, which it does not. The Commission's hypothesis is that the change in water consumption behaviour occurred abruptly between 2005–06 and 2006–07, not cumulatively over a period of years.

7.3.2 Cardno forecasts

As Cardno foreshadowed, the water aware variable improves the fit of its equations, which it then uses to forecast water sales. Forecasting from the equations requires that Cardno assign values to the explanatory variables through the forecast period. Cardno assumes that there will be no change to the level of water restrictions and that average climate conditions will prevail during the forecast period.

Logically, the first of these assumptions should produce a water aware variable that increases by one in each year of the forecast period, one being the annual index of permanent water conservation measures. Cardno, however, elects to hold the value of water aware constant through the forecast period at its value in 2013–14. The reasons offered for this decision are unconvincing. Cardno begins by noting that "We do not know exactly what this variable represents". It is difficult to see, therefore, on what basis Cardno could make any statement about what the value of the variable is likely to be in the forecast period. Cardno goes on to note that in holding water aware constant

²⁴ This variable is already present in the equations as measuring the extent of water restrictions.

"we effectively state that a structural break has occurred and is complete".²⁵ Why this state of completeness should fortuitously be achieved just as the forecast period begins is not explained. In fact, no evidence at all is offered in support of this crucial hypothesis.

In its Briefing Note of March 2015, Cardno concedes that the values of the water aware variable that it assumes for the forecast period "are inconsistent with the historical values".²⁶ Cardno then asserts that projecting water aware going forward alongside their housing analysis would constitute a double count. Since water aware happily coexists with Cardno's housing analysis in the estimation period, a double count would only occur if the effect that water aware represents ceased to operate at the beginning of the forecast period. This again highlights the crucial, but unjustified, assumption made by Cardno that the water aware effect, whatever it is, ceases to operate at the beginning of the forecast period.

Since water aware has a negative coefficient in the equations, the effect of holding it constant, instead of allowing it to continue to grow, is to forecast that sales per customer will grow more strongly than would have otherwise been predicted. Cardno's Briefing Note reveals that, maintaining the definition of the water aware variable used in the estimation period into the forecast period would lower the 2014–15 forecast of water sales by 1.79 per cent and the 2017–18 forecast by 7.14 per cent. This means that, rather than growing by 1.2 per cent per year on average over the forecast period, forecast water sales would decline by 0.6 per cent per year.

A1.4 Commission concerns

A more serious concern than that there is no sound basis for the growth in the water sales forecast by the Cardno model is that the forecast level of water sales from which the growth commences may be well wide of the mark.

A1.4.1 A spurious level shift and volatility in the forecasts

The first reason for this concern is the effect of estimating the forecasting equations across a structural break. A simple way to see the effect of this is to compare averages, remembering that the purpose of forecasting water sales is to estimate their average level across climate scenarios. Cardno estimates its forecasting equations on annual data for the 13 years 2001–02 to 2013–14. The first five of these years are before the structural break identified by the Commission and the last eight are after it. Average water sales in the earlier sub-period are 49.5 GL, in the second 38.8 GL and over the whole period 42.9 GL. This indicates that using the average over the whole period to

²⁵ Again, this is a misuse of the term "structural break" as it is usually applied in the statistical literature and as it was used by the Commission. In this usage a structural break occurs at a point in time not over a period of time.

²⁶ Cardno, 2015: 14.

forecast for 2014–15 and beyond is likely to overstate the level of water sales that will be achieved. Although the statistical techniques employed in forecasting are more sophisticated than taking averages, to the extent that they ignore the effects of the structural break identified by the Commission, they will suffer from the same tendency to overestimate the likely levels of consumption for years following the structural break. By misrepresenting the structural break as a gradual rather than an abrupt phenomenon, Cardno's forecast will be susceptible to such overestimation.²⁷ For reference, Cardno's forecast for 2014–15 is 43 GL; the Commission's current forecast, based only on data for the period since the structural break, is 39 GL.

The second reason for being concerned about the basis of Cardno's forecast is the erratic performance of the equations in the last three years of the estimation period, the years following the lifting of restrictions. The erratic behaviour of the equations is evident in the charts on pages 70 and 71 of the Cardno report and Figure 2-7 in the Briefing Note.²⁸ The Commission has not had access to the consumption data by customer category used by Cardno in estimating the customer category equations depicted in these charts. The Commission has, however, been able to obtain very similar results for water sales at the aggregate level. In the Commission's aggregate version of Cardno's equation the largest differences between the values predicted by the equation and the actual values of water sales occur in the last two years of the estimation period. These differences are substantially greater than any occurring earlier in the estimation period. This volatility in the predictions of the equation at the end of the estimation period and immediately before the forecast period is an obvious concern.

A1.4.2 The role of water sales forecasts for 2014–15

Although the substitute price direction only affects prices for 2015–18, the water sales forecast for 2014–15 influences the prices set for these years. This is because the Panel has determined afresh a price path over the whole regulatory period, 2013–18. In setting this path the Panel has adopted the actual value of water sales for 2013–14 as its "forecast" for that year, but has adopted the Cardno forecast of 43.15GL for 2014–15. If water sales for 2014–15 are overestimated, revenues generated over the regulatory period at any given set of prices will be overestimated. Consequently, prices will be set too low to allow Icon Water to generate the revenues it has been assessed to need.

It has been evident since at least the end of February 2015 that water sales in 2014–15 would not approach the level of 41.93 GL seen during 2013-14. Using data up to the

²⁷ This susceptibility is heightened by the values attributed to the water aware variable by Cardno in the forecast period.

²⁸ In its Briefing Note, Cardno modifies its forecasting equations in a way that has the effect of introducing three new variables into the equations. Although Cardno reports that this improves the fit, it is questionable whether any of the usual statistical tests have much meaning when parameters have been estimated with only seven degrees of freedom. Judging by the charts in the Briefing Note, the change in specification does not appear to have had much effect on the in-sample predictions for the last two years.

end of March 2015, the Commission estimates that water sales for 2014–15 are unlikely to exceed 39.5GL. If, as now seems virtually certain, this turns out to be correct, it means that water prices established under the substitute price direction will not allow Icon Water to recover the revenues it has been assessed to require, even if the high water sales forecasts made by Cardno for 2015–18 turn out to be accurate.

That Cardno's forecast water sales for 2014–15 look almost certain to have been a substantial overestimate lends further weight to the argument above that, by using data that spans a significant change in water consumption behaviour, Cardno may have overestimated the average level of water sales likely to prevail over the balance of the regulatory period. If this is the case, Cardno's forecasts for 2015–18 are likely to overestimate the outcomes in those years by a similar margin.

A1.5 Summary

In the Commission's view, the use of Cardno's forecasts of water sales to set the price of water carries a very serious risk that actual sales will fall short of this level, resulting in reductions in Icon Water's revenues. Were cool, damp climate conditions to predominate in the next three years, it is possible that Icon Water could become reliant on its sewerage services revenues to offset losses in its water business and maintain the financial viability of its water and sewerage services business. This is illustrated by the example provided at page 23 of the main text.

Appendix 2 The cost of capital and indexation of the RAB

This appendix discusses two aspects of the determination of the revenue required by Icon Water that are logically separate, but have become intertwined in much current regulatory practice in Australia and elsewhere: the cost of capital and indexation of the RAB. We first discuss them separately, noting that many of the issues arising here have aired elsewhere so treatment can be brief, before looking at the way they have become intertwined.

A2.1 Rate of return on capital

The standard approach to measuring the cost of capital, adopted by the Commission and the Panel, is to calculate it as the weighted average of the cost of debt and the cost of equity, with the weights being determined by the gearing ratio of the entity, debt as a proportion of debt plus equity. This weighted average cost of capital or WACC is then applied to the RAB to determine an allowance in required revenue to provide a return on capital. The cost of debt portion is provided to allow the regulated entity to meet its financing costs and the cost of equity portion to allow it to pay a return to its shareholders. Having settled on this framework, the next question is whether to use the actual costs of debt and equity for the regulated entity or whether to use the costs of some benchmark or typical entity. The former is usually described as the firm specific approach and the latter as the typical or benchmark firm approach

If the former option is chosen, measuring the cost of debt involves examining the term sheets of the debt owed by the regulated entity and turning total financing costs into an interest rate applying to the total volume of debt outstanding. While this may involve some intricate calculations, it is not usually a contentious matter because the accounting standards applying to the regulated entity will largely dictate how the calculation should be done.²⁹ Setting a cost of equity under this option is more difficult for a publicly owned entity, although it is not difficult to come up with a range within which this parameter should lie. In the 2013 review, the Commission consulted government and the community and looked at overseas practices and returns in the private sector before adopting a value close to the midpoint of the range.

²⁹ There are some other issues to be settled, such as whether the measure should be backward looking and allow for costs that have been incurred or whether it should be forward looking and attempt to measure costs that will be incurred. For present purposes these are less important than the issues discussed in the text. In its 2013 review, the Commission adopted a forward looking approach. There is also the question of how corporate tax should be handled. The position adopted by the Commission in the 2013 review was that, since corporate tax on Icon Water in the ACT takes the form of tax equivalent payments to the government shareholder, it can be put to one side.

If the latter option is chosen, a financial model is typically employed to calculate the costs of debt and equity. The task then becomes to determine the values of the parameters that should be used to populate that model. This process involves the exercise of a great deal of judgment in selecting parameters that are deemed appropriate for the regulated entity. The difficulty is intensified because the entity that the parameters are supposedly derived from is most often hypothetical. This aspect of price regulation has probably generated more contention, caused more appeals against regulatory decisions and consumed more resources than any other.

Prior to the Commission's 2013 review, the practice in the ACT had been to adopt the second option. This had generated costs of debt higher than the government borrowing rate that Icon Water is able to access through the ACT Treasury and costs of equity well in excess of any actual return on equity achieved by Icon Water.³⁰ In its 2013 review, the Commission decided to adopt the first option. Objections were raised to this approach, including that it offended against competitive neutrality and would harm economic efficiency. The Commission had dealt with many of the issues in its draft report, but returned to them and provided further analysis in its final report.

The Commission concluded that adopting the firm specific approach did not conflict with the competitive neutrality policy in place in the ACT, having been assured by the ACT government that this was the case. The Panel seems to have based its deliberation on this issue in its draft report on inaccurate information. While the Panel noted the Commission's advice to this effect in its final report, the Panel, nevertheless, reached similar conclusions to those in its draft report. The Commission found the arguments on efficiency grounds simply unconvincing. Lengthy analysis to support this conclusion may be found in those two reports, but, in a nutshell, the Commission was unable to find a connection between allowing Icon Water to collect more revenue than it actually required to meet its interest costs and the efficient allocation of resources in the ACT or Australia. The Panel seems to have found such a connection or, through its resort to common practice regulation, been satisfied that others have.

A2.2 Indexation of the RAB?

Having determined a WACC, the next question is how should it be applied to the RAB? Again there are two options: apply the WACC as determined through the process described above to the current dollar value of the RAB or apply the WACC discounted for expected inflation to a RAB the dollar value of which is increased at the expected rate of inflation. The former may be referred to as the nominal RAB approach and the latter as the indexed RAB approach.

Indexation of the RAB seems to have been introduced into Australian regulatory practice in response to a particular situation that arose in the natural gas transportation

³⁰ Some of the reasons for this relate to the use of an indexed RAB and are discussed below.

industry in the 1990s. Regulators were persuaded that low rates of return would lead regulated service providers to make investments in increased capacity in inefficiently small increments, given the growth in demand that regulators expected to see in the medium term. Higher rates of return would increase the size of these increments, but would also generate higher prices for customers. As will be discussed in detail below, indexation of the RAB allowed higher rates of return to be offered without much immediate impact on prices. Regulators believed that the longer term impact on prices would be mitigated by the strong growth in demand for gas that was foreseen. While the use of an indexed RAB has subsequently become a prominent feature of Australian regulatory practice, many of the industries in which it is used do not possess the features that led to its initial adoption. For example, water in the ACT is characterised by static or falling demand and no requirement for rapid expansion of capacity.

A2.2.1 Nominal RAB

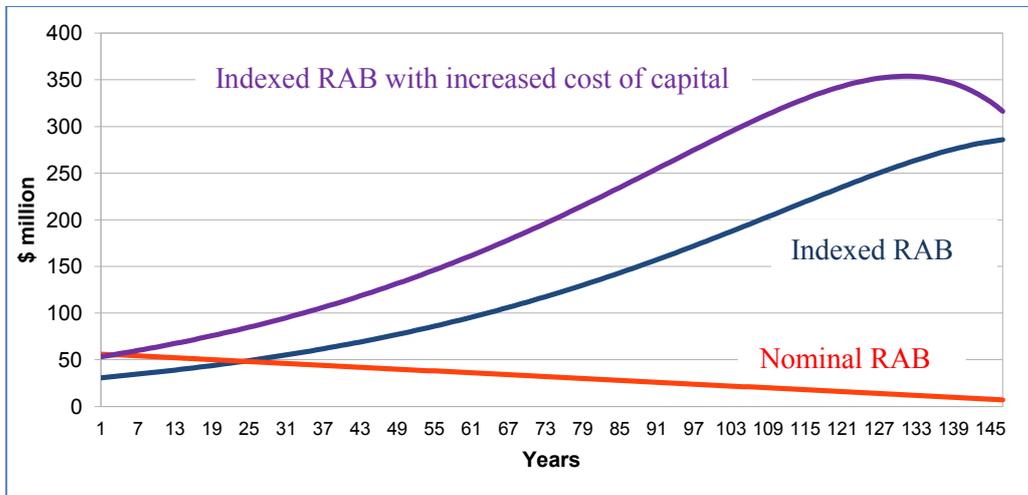
To understand the way in which these alternative ways of treating the RAB operate, let us begin with the simplest case in which the cost of debt determined by the regulator reflects the actual cost of debt to the regulated entity and the determined return on equity satisfies the shareholders. Then, under a nominal RAB, the regulated entity receives a cost of capital component in revenue in each year of the regulatory period sufficient to meet its finance costs in full and provide its shareholders with the determined return on equity.³¹ The allowance for the depreciation of the RAB would then allow the regulated entity to repay lenders and shareholders the capital cost of any asset acquired within the RAB over its economic life.

The financing allowance, defined as the sum of the return on capital and the allowance for depreciation, for an asset costing \$450 million with an economic life of 147 years under a cost of capital of 4.93 per cent is illustrated by the bottom line in Chart A1.1.³²

³¹ The return on equity can take the form of dividend payments or, if profit is retained by the regulated entity, increases in the equity in the entity held by the shareholders. Under ACT Government policy, Icon Water is not permitted to retain any portion of profit.

³² These parameters match the approximate cost and economic life of the Enlarged Cotter Dam as well as the average cost of capital estimated by the Commission as calculated in the main text.

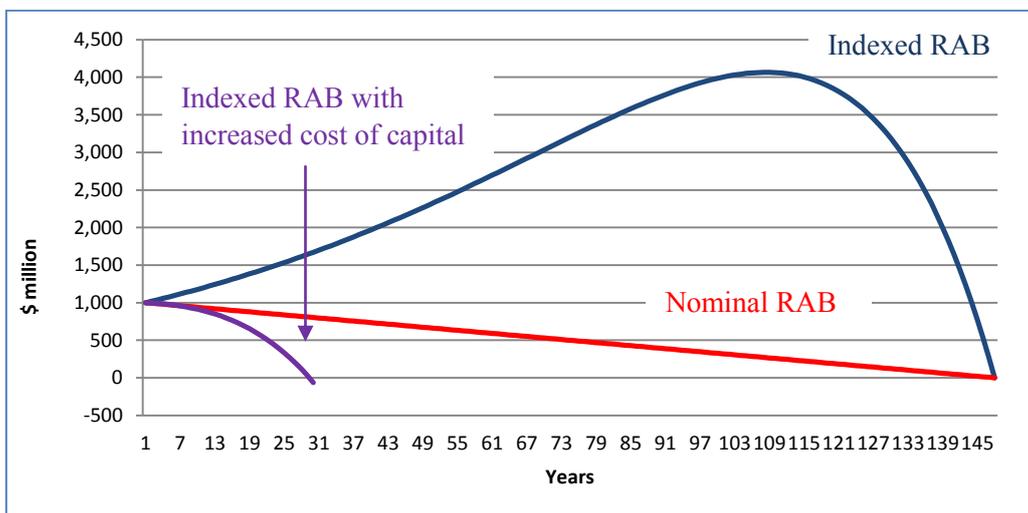
Chart A1.1 Annual financing allowance for an asset costing \$450 million and a life of 147 years



Source: Commission's calculations.

It can be seen that payments tend to be concentrated in the early years of the asset's life with about 6 per cent of total payments made in the first five years or 3.5 per cent of the asset's life. Since the financing allowance provides sufficient funds to meet the full amount of interest costs as they fall due and repay the capital cost over the life of the asset, the liability incurred by the regulated entity in acquiring the asset falls steadily to zero over the asset's economic life as shown in the middle line in Chart A1.2.

Chart A1.2 Liability outstanding from purchase of asset costing \$450 million



Source: Commission's calculations.

A2.2.2 Indexed RAB

If instead the option of an indexed RAB had been chosen, the situation is more complex. Since the cost of capital component in revenue under this option is calculated

using a discounted WACC, it will not be sufficient to meet the finance charges and pay the determined return on equity in the early years of the asset's life. Under the legislation and accounting standards which govern Icon Water's operations, it is obliged to record the full amount of its financing costs as a charge against profit. Hence profit will be reduced by the amount by which the discounted cost of debt component of the discounted WACC falls short of meeting actual finance costs in the early years of the asset's life.

In these early years, the profit derived from the asset's acquisition is reduced on two counts by the adoption of an indexed RAB. First, the cost of equity is discounted for inflation before being applied to the asset's value in the RAB. Second, profit is further reduced by the discounted cost of debt component being insufficient to meet the regulated entity's finance costs. Thus profit is reduced by the full amount of the reduction in the dollar return on capital brought about by the discount applied to the WACC. Offsetting these impacts in the early years of the asset's life are the increases in the RAB brought about by its indexation, which manifest strongly in the later years of the asset's life. As can be seen in the middle line in Chart A1.1 and the upper line of Chart A1.2, under an indexed RAB, the larger payments received in the later years exactly compensate for the lower payments received in the earlier years.

The revenues received over time are shown in the middle line in Chart A1.1. The effect of indexation is to cause these to increase over the life of asset, with the rate of increase declining slightly in the final years. Consequently, although these revenues are not sufficient to pay the determined return on equity in the early years, over time they reach a point where they are sufficient; then surpass that and begin to allow the regulated entity to provide a return on equity in excess of that determined by the regulator and compensate shareholders for the lower returns received in the earlier years.

The level of the incurred liability is shown in the upper line of Chart A1.2. It increases to start with because shareholders are not receiving the determined return on equity, but declines as the growing revenues allow these to be paid down, finally reaching zero at the end of the asset's life. In the ACT certainly and perhaps in other jurisdictions, the financing required to offset the shortfall in the payments to shareholders would have to be undertaken by the shareholders because the regulated entity is not allowed to borrow for the purpose of providing a return on equity. The gap between the top and middle lines in Chart A1.2 shows the amount of debt required at each point in the life of the asset. As can be seen the debt outstanding climbs for about 70 per cent of the asset's life, peaking in the 105th year at just over \$4,000 million before falling to zero over the remaining 42 years of the asset's life.³³

³³ The Commission's analysis of the Fair Cost Recovery option, which would have redistributed the burden of the water security projects across generations, in the draft report of the 2013 review showed that it generated a similar debt funding profile. This is one of the reasons that option was not included in the final determination.

A2.3 Net present value equivalence

This property whereby both options reduce the incurred liability to zero over the life of the asset is referred to as net present value equivalence and is a key principle in regulatory economics. While the logic of the foregoing analysis is impeccable, there are certain practical difficulties.

The main problem is the time scale involved in things working themselves out. The scale and term of the debt have already been remarked on. Financial markets simply do not offer means of making the kinds of arrangements envisioned in net present value equivalence over these sorts of timeframes. The probability of a determination brought down in 2015 still being binding regulators in 2162 is vanishingly small. Most regulatory regimes in Australia have barely been in operation for two decades. The period over which a regulatory determination runs is typically around half a decade. These difficulties have caused regulators to marry an indexed RAB with a typical firm approach to the determination of the cost of capital in a way that the Commission finds to be confusing for stakeholders and ultimately damaging for the community.

A2.4 The interaction

Financial benchmarks applied to regulated entities, such as tests for asset impairment or financeability, typically emphasise near term financial flows. Let us, therefore, begin our analysis of the interaction of the determination of the cost of capital with the treatment of the RAB by looking at the impact of these decisions within the regulatory period. It is only over this period that the regulator can guarantee that prices will be determined according to the principles that the regulator has established. Beyond this horizon, prices will be determined in a different context and, perhaps, by different people who may or may not choose to continue to provide the flow of revenue envisioned by the net present value equivalent regulatory arrangements being put in place today.

A2.4.1 In the current regulatory period

Maintaining, for the moment, the assumption of the previous section that the costs of debt and equity have been accurately determined in our example case, we can calculate that adopting the indexed RAB approach reduces the financing allowance component of revenue by somewhat over 45 per cent in the first year of the regulatory period relative to the amount that would have been received had an unindexed RAB been adopted. By the last year of a five year period, the cumulative difference has risen to almost 47 per cent, as interest at the cost of capital is added to the annual shortfalls. This means that, over the regulatory period, the regulated entity receives barely more than half the financing allowance that it needs to meet its interest costs, provide a return on equity and make provision for depreciation in the value of the asset. The fact that the financing allowance is a substantial proportion of total revenues makes this a serious situation for the regulated entity. For Icon Water, the financing allowance

accounts for about 35 per cent of required revenue. Clearly, regulating an entity in this way would rapidly prove to be unsustainable.

Two ways out of this difficulty are to abandon indexation of the RAB or increase the estimate of the cost of capital so that, even after discounting, it provides sufficient revenue to enable the regulated entity to meet all its obligations to its lenders and shareholders within the regulatory period.³⁴ The first option is the one the Commission adopted in its 2013 review. The second is, in the Commission's view, an accurate characterisation of the way the combination of the typical firm approach to the determination of the cost of capital has been combined with an indexed RAB in earlier reviews.

The second option is capable of providing just sufficient revenue to keep the regulated entity viable within the regulated period. For example, as the calculations in the main text show, the Commission's and Panel's assessments of required revenue for the regulatory period turned out to be remarkably close. The longer term implications of adopting the second option are, however, radically different from those of adopting the first.

A2.4.2 In subsequent regulatory periods

In our example, it turns out that increasing the cost of capital by 2.2 percentage points under an indexed RAB is sufficient to cause that approach to deliver the same financing allowance as the unindexed approach with the original cost of capital over a five year regulatory period.³⁵ Increasing the cost of capital in this way means that financing allowances in the early years are similar to those that would have been provided under a nominal RAB at the original return on capital. In the later years of the regulatory period, however, as the impact of indexation of the RAB becomes apparent, financing allowances under the increased return on capital become ever larger than those that would have been provided under a nominal RAB. If the approach is continued into a subsequent period, as is implicitly assumed in evaluating alternative methodologies for establishing regulated rates of return, the surplus of the financing allowance over the needs of the regulated entity continues to grow.

The situation is depicted in the upper line of Chart A1.1. This line is more or less coincident with the bottom, nominal RAB, line for the first five years, showing that the financing allowances delivered with the regulatory period are the same under either approach. Then the top line climbs away, creating a gap between itself and both the other two lines in the chart. The gap between the top two lines is indicating the year by

³⁴ Another way out of the difficulty is to adjust the time path of required revenue in a net present value neutral way to provide the regulated entity with the revenue it requires within the regulatory period. This avoids some of the difficulties identified here, but is more complex than adopting a nominal RAB. For an example of the use of this alternative, see IPART (2013).

³⁵ The required increase is less than the expected inflation rate, 2.5 per cent, because indexation of the RAB increases the base to which the cost of capital is applied.

year extent of over compensation caused in subsequent periods by adjusting the cost of capital to provide a sufficient financing allowance for the regulated entity during the regulatory period.

It will be apparent from the above discussion that there is nothing here that is specific or restricted to the ACT. Evidence of this issue being more general can be found in the experience of IPART in New South Wales. Here the regulator has found it difficult to reduce the cost of capital for some of the utilities it regulates to more acceptable levels while maintaining their capacity to pass the financeability tests applied to utilities in that jurisdiction.³⁶

It is instructive to compare Chart A1.1 here with the chart in Box 8.2 of the Panel's draft report. The Panel's chart is based on a similar example and purports to compare the Panel's approach with that of the Commission. What, in fact, it compares is a nominal with an indexed approach for a given cost of capital. The approaches of the Panel and the Commission differ not only in their decision whether or not to index the RAB but also in the cost of capital adopted. If the Commission's assessment of the cost of capital is correct, the appropriate comparison is provided by looking at the top and bottom lines in Chart A1.1. This shows that, while the Commission's and Panel's approaches deliver similar financing allowances within the regulatory period, maintenance of the Panel's approach into the future, as Box 8.2 depicts, will lead to an increasing financing allowance being provided to the regulated entity, rapidly growing to levels way beyond what is required to maintain its viability.

One way of depicting the consequence of this is shown by the bottom line in Chart A1.2. If the regulated entity were to devote all the surplus revenue to discharging the liability incurred in acquiring the asset, it could be discharged within 29 years rather than taking the 147 years intended. In the ACT at least, this would not occur because the surplus revenue would appear as extra profit in Icon Water's accounts and, under the taxation and distribution policies applied to Icon Water, would be remitted to the government as tax equivalent and dividend payments

The alternative hypothesis in comparing the approaches of the Commission and the Panel is that the Panel's estimate of the cost of capital to Icon Water is correct. In this case, the Commission's 2013 determination would fail to provide a large enough financing allowance to allow Icon Water to meet its debt obligations and provide a return on equity. Clearly, in this case the Panel's finance allowance would not prove sufficient within the regulatory period either because it is the same as the Commission's.

³⁶ For more detail on how IPART approached these issues, see IPART (2013).

A2.5 Conclusion

This leaves two possible outcomes from the Panel's choice of cost of capital and indexation of the RAB. The first is that, because the Panel has set a cost of capital above Icon Water's true cost of capital to maintain its financial viability under an indexed RAB, maintenance of the Panel's approach in future regulatory periods will lead to over recovery of revenue by Icon Water and excessively high water prices for Icon Water's customers. The second is that, because the Panel has set the cost of capital correctly but adopted an indexed RAB approach, Icon Water will be denied needed revenue within the regulatory period, threatening its financial viability. These are precisely the outcomes the Commission sought to avoid by not adopting an indexed RAB.

The evidence of Icon Water's financial performance over the first two years of the operation of the Commission's price direction supports the contention that the Commission's estimate of Icon Water's cost of capital is accurate and that the Panel has set a cost of capital above Icon Water's true cost of capital to maintain its financial viability within the regulatory period under an indexed RAB. While this means the financing allowance provided under the substitute price direction will not be much different from that provided under the Commission's price direction within the current regulatory period, maintenance of the Panel's approach will generate a much greater financing allowance and, therefore, much greater upward pressure on prices than maintaining the Commission's approach in subsequent regulatory periods.

Abbreviations and acronyms

| | |
|------------|---|
| ANU | Australian National University |
| Commission | Independent Competition and Regulatory Commission |
| CPI | Consumer price index |
| GL | gigalitre |
| ICRC | Independent Competition and Regulatory Commission |
| ICRC Act | <i>Independent Competition and Regulatory Commission Act 1997 (ACT)</i> |
| IPART | Independent Pricing and Regulatory Tribunal (of New South Wales) |
| kL | kilolitre |
| Panel | Industry Panel |
| RAB | Regulatory asset base |
| UMA | Utilities Management Agreement |
| WACC | Weighted average cost of capital |

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